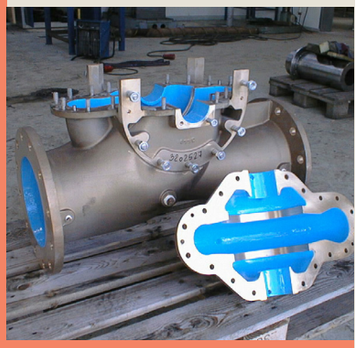
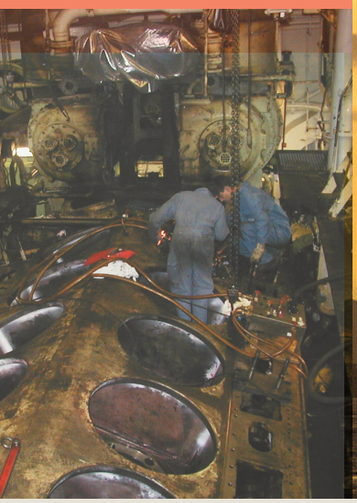
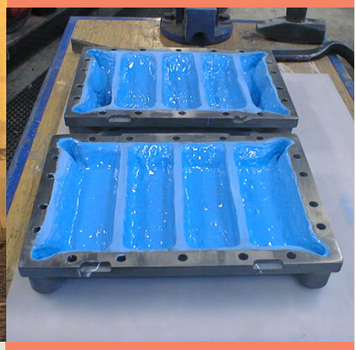
Repair of deteriorated machine parts

- Around the world
- Around the clock
- Fast solution
- Long lasting solution
- Cannot corrode
- Approved by Class
- Short delivery time
- Cost effective







WENCON®

repair solutions for you

www.wencon.com

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Denmark
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INDEX

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Product Brochures:

No. 4 - 01.04.2013

Wencon Cream

The basic multipurpose epoxy compound for repair and rebuilding of deteriorated metal parts.

- Wide range of applications
- Strong adhesion to all metal surfaces
- Low curing temperature
- Simple mixing and application
- Fully machinable

Wencon Cream is a basic two-component, epoxy compound with a wide range of applications for repair and rebuilding of worn, damaged, cracked and corroded metal parts.

Typical applications are corroded tanks, pump housings, impellers, valves, pipes, flange faces, roller bearing seats, worn shafts, hydraulic rams and heat exchangers. Wencon Cream is also excellent as a filling compound.

Wencon Cream exhibits many of the characteristics of metals, which together with outstanding adhesion to all metallic surfaces makes the repair compound highly suitable for repair of corroded and worn metals.

Wencon Cream is non conducting and can therefore not corrode or bi-metallic corrode. After curing the compound is resistant to oil, water, saltwater and most diluted acids and a range of solvents. Heat resistance ranges from 60° C (140° F) in corrosive and heavy load environments and up to 250° C (482°F) when applied as a filling compound.

Wencon Cream can be machined, drilled and worked like metal after curing. The compound has a paste consistency and is easily applied by spatula also to vertical surfaces.

Wencon products are designed to be simple to use and cost effective. Easy mixing ratios (1:1 by volume) reduce waste to a minimum and high specific volumes give high coverage rates.

Mix 1:1

Product numbers:		IMPA no.	ISSA no.
No. 1010	Wencon Cream, 1 kg (2,2 lb) unit	812335	75.553.20

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WENCON®

Product Information

General description
Two component solvent free paste consistency epoxy repair compound.

Surface preparation
The surface must always be clean and degreased

Applying to new steel surface:

- shot blasting to SA 2,5
- if shot blasting is not possible use grinding
- after grinding the surface must be degreased with Wencon Cleaner

Repairing old steel surface:

- shot blasting to SA 2,5
- sweat out water and salts
- shot blasting to SA 2,5 again
- profile 75 microns

Mixing Ratio
Mix by volume 1:1. Mix until an even colour is obtained.

Applying
Wencon Cream can be applied by spatula.

Pot Life
Depending on amount mixed and temperature. Mixed in small amounts, the pot life is approximately 30-60 minutes at 20°C (68°F)

Curing time
Curing will take place in 10-15 hours at 20°C (68°F)

Reduced curing time with infrared
This product is tested with and suitable for infrared curing. Curing with infrared radiation can reduce curing time significantly. Result can vary, depending on circumstances and equipment used.

Machine-ability
After curing the product can be machined just like metal

Technical Data
Hardness Shore D: 75 (DIN 53505)

Tensile strength: 14,3 N/mm² - 2035 p.s.i. (DIN 53454)

Compressive strength:

Modulus of elasticity: 1689 N/mm² - 240,000 p.s.i. (DIN 53454)

Rcrack: 58 N/mm² -8,500 p.s.i. (DIN 53454)

Adhesion to steel: 14,40 N/mm2

Specific volume
775 ccm per kilogramme (49,5 cu inch/kg)

Temperature Resistance
Corrosion: 60°C (140° F)

Light load: 120°C (248°F)

As filler: 250°C (482°F)

Chemical Resistance
The compound is resistant to oil, water, saltwater and most diluted acids and alkalis as well as a range of solvents.

Shelf life
@ 20°C (68°F): 3 years

Handling Precautions
Read the instructions for use and the Material Safety Data Sheet.

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Wencon Rapid

The fast curing multipurpose epoxy compound for repair and rebuilding of deteriorated metal parts

- Fast curing – reduced down time
- Wide range of applications
- Strong adhesion to all metal surfaces
- Simple mixing and application
- Convenient unit sizes

No. 4 - 01.04.2013

Wencon Rapid is a fast curing, two-component, epoxy compound with a wide range of applications for emergency repairs and maintenance.

Typical applications are emergency repairs, where a short curing time is required to reduce down time. Wencon Rapid is very suitable for applications where thicker layers of material are required, as the compound quickly sets and becomes solid. The compound can also be used for regular maintenance jobs and as a filling compound.

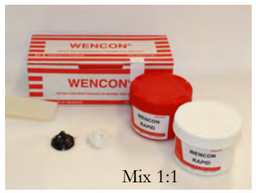
Wencon Rapid exhibits many of the characteristics of metals, which together with outstanding adhesion to all metallic surfaces makes the repair compound highly suitable for repair of corroded and worn metals.

Wencon Rapid is non conducting and can therefore not corrode or bi-metallic corrode. After curing the compound is resistant to oil, water, saltwater and most diluted acids and a range of solvents. Heat resistance ranges from 60° C (140°F) in corrosive and heavy load environments and up to 250° C (482°F) when applied as a filling compound.

Wencon Rapid can be machined, drilled and worked like metal after curing. The compound has a paste consistency and is easily applied by spatula also to vertical surfaces.

For convenience, Wencon Rapid is available in two unit sizes. The one kilo unit for large repairs and the practical 8x125g unit for the small and quick repair jobs.

Wencon products are designed to be simple to use and cost effective. Easy mixing ratio (1:1 by volume) reduces waste to a minimum and high specific volumes give high coverage rates



Mix 1:1

Product numbers:		IMPA no.	ISSA no.
No. 1000	Wencon Rapid, 1 kg (2,2 lb) unit	812347	75.553.21
No. 1005	Wencon Rapid 8, 8x125g (8x0,28 lb) unit	812343	75.553.22

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Product Information

General description
Fast curing two component solvent free paste consistency epoxy repair compound.

Surface preparation
The surface must always be clean and degreased

Applying to new steel surface:

- shot blasting to SA 2,5
- if shot blasting is not possible use grinding
- after grinding the surface must be degreased with Wencon Cleaner

Repairing old steel surface:

- shot blasting to SA 2,5
- sweat out water and salts
- shot blasting to SA 2,5 again
- profile 75 microns

Mixing Ratio
Mix by volume 1:1. Mix until an even colour is obtained.

Applying
Wencon Rapid can be applied by spatula.

Pot Life
Depending on amount mixed and temperature. Mixed in small amounts, the pot life is approximately 10-20 minutes at 20°C. (68°F)

Curing time
Curing will take place in 40-90 minutes at 20°C. (68°F)

Reduced curing time with infrared
This product is tested with and suitable for infrared curing. Curing with infrared radiation can reduce curing time significantly. Result can vary, depending on circumstances and equipment used.

Machine-ability
After curing the product can be machined just like metal

Technical Data
Hardness Shore D: 81 (DIN 53505)

Tensile strength: 9,2 N/mm² - 1310 p.s.i. (DIN 53454)

Compressive strength:

Modulus of elasticity: 2891 N/mm² - 411,000 p.s.i. (DIN 53454)

Rcrack: 112 N/mm² - 16,000 p.s.i. (DIN 53454)

Adhesion to steel: 20 N/mm2

Specific volume
709 ccm per kilogramme (45,3 cu inch/kg)

Temperature Resistance
Corrosion: 60°C (140°F)

Light load: 120°C (248°F)

As filler: 250°C (482°F)

Chemical Resistance
The compound is resistant to oil, water, saltwater and most diluted acids and alkalis as well as a range of solvents.

Shelf life
@ 20°C (68°F): 3 years

Handling Precautions
Read the instructions for use and the Material Safety Data Sheet.

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No. 4 - 01.04.2013

Wencon Coating

The versatile and cost effective coating product for general repair, maintenance and protection jobs.

- Strong adhesion to all metal surfaces
- Efficient double coat system
- Easy mixing and application
- High coverage rate
- Fully machinable

Wencon Coating is a two-component, liquid epoxy coating suitable for a wide range of applications. It provides a smooth non porous surface, which is resistant to bi-metallic corrosion, light chemical aggression, corrosion and erosion as well as impingement.

Typical applications are coating of surfaces rebuild after deterioration, protection of tanks, pumps, valves, wet liners, cooler end covers etc. against corrosion and bi-metallic corrosion as well as a variety of small and large repair and maintenance jobs.

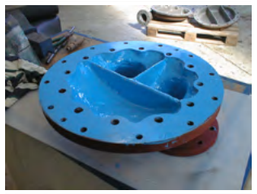
Wencon Coating has been developed for use in marine, offshore and industry and is suitable for a wide range of applications.

Wencon Coating offers resistance to oil, water, saltwater and most diluted acids and alkalis as well as a range of solvents. Heat resistance ranges from 60° C (140°F) in corrosive and heavy load environments and up to 250° C (482°F) when applied as a filling compound.

Wencon Coating is a double coat system and is consequently supplied in two different colours, white and blue. The product is liquid and is applied by brush, roller or spatula.

The Wencon products are designed to be simple to use and cost effective. Easy mixing ratio (1:2 by volume) reduce waste to a minimum and high specific volumes give high coverage rates.

Mix 1:2



Product numbers:		IMPA no.	ISSA no.
No. 1020	Wencon Coating, white 0,5 kg (l,l lb)	812337	75.553.10
No. 1030	Wencon Coating, blue 0,5 kg (l,l lb)	812338	75.553.11

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Product Information

General description
Two component solvent free liquid epoxy coating for protection against bimetallic corrosion, corrosion and erosion as well as impingement

Surface preparation
The surface must always be clean and degreased

Applying to new steel surface:
- rounding (blunting) with radius 2mm
- shot blasting to SA 2,5
- profile 75 microns

Repairing old steel surface:
- rounding (blunting) with radius 2mm
- shot blasting to SA 2,5
- sweat out water and salts
- profile 75 microns

Mixing Ratio
Mix by volume 1:2. Mix until an even colour is obtained.

Applying
Wencon Coating can be applied by spatula or brush.

Overcoating
Wencon Coating is a double coat system. The overcoating time can vary from one to three hours depending on temperature. The second coat must be applied whilst the first coat is still tacky. If full curing has occurred a light sandblasting or grinding is necessary prior to the second coat

Pot Life
Depending on amount mixed and temperature. Mixed in small amounts, the pot life is approximately 20-30 minutes at 20°C (68°F)

Curing time
Curing will take place in 10-15 hours at 20°C. (68°F)

Reduced curing time with infrared
This product is tested with and suitable for infrared curing. Curing with infrared radiation can reduce curing time significantly. Result can vary, depending on circumstances and equipment used.

Machine-ability
After curing the product can be machined just like metal

Technical Data
Hardness Shore D: 80
Tensile strength:12,9 N/mm² - 1835 p.s.i. (DIN 53454)

Compressive strength
Modulus of elasticity: 2199 N/mm² - 314,000 p.s.i. (DIN 53454)

Rcrack: 95 N/mm² - 13,500 p.s.i. (DIN 53454)

Adhesion to steel:16,20 N/mm2

Specific volume
730 ccm per kilogramme (46,7 cu inch/kg)

Coverage rate
Theoretical: 0,80 kg per m² (0,16 lb/sq. ft.) at 600 microns

Practical: 1,0 kg per m² (0,20 lb/sq. ft.)

Temperature Resistance

Corrosion:	60°C (140°F)
Light load:	120°C (248°F)
As filler:	250°C (482°F)

Chemical Resistance
The coating is resistant oil, water, saltwater, most diluted acids and a range of solvents

Shelf life
@ 20°C: 3 years (68°F)

Handling Precautions
Read the instructions for use and the Material Safety Data Sheet.

Quality test
Poretest and test of layer thickness can be tested with normal electronic instrument like high voltage and high frequence

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No. 4 - 01.04.2013

Wencon Hi-Temp

The high performance coating product for repair and protection in high temperature and aggressive environments

- High heat resistance
- Good chemical resistance
- Excellent mechanical wear properties
- Strong adhesion to all metal surfaces
- Fully machinable

Wencon Hi-Temp is a high performance two-component, liquid epoxy coating developed for applications in high load areas. It provides a smooth non porous surface, which is resistant to high temperatures, strong chemical aggression and wear as well as bi-metallic corrosion.

Typical applications are coating of surfaces rebuild after deterioration including repair of lining on inert gas systems, fresh water generators, hot pipes and heating coils, protection of tanks, pumps and valves against chemical and mechanical aggression, corrosion and bi-metallic corrosion.

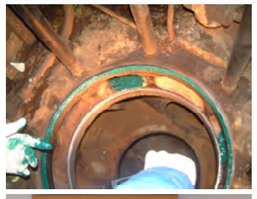
Wencon Hi-Temp has been developed for use in marine, offshore and industry and is suitable for a wide range of applications where high performance characteristics are required.

Wencon Hi-Temp offers resistance to oil, water, saltwater and wide range of acids and alkalis as well as a range of solvents. Heat resistance ranges from 160° C (320°F) in corrosive and heavy load environments and up to 300° C (570°F) when applied as a filling compound.

Wencon Hi-Temp is a double coat system and is consequently supplied in two different colours, yellow and green. The product is liquid and is applied by brush, roller or spatula.

The Wencon products are designed to be simple to use and cost effective. Easy mixing ratio (1:2 by volume) reduce waste to a minimum and high specific volumes give high coverage rates.

Mix 1:2



Product numbers:		IMPA no.	ISSA no.
No. 1050	Wencon Hi-Temp, yellow, 0,5 kg (1,1 lb) unit	812345	75.553.12
No. 1060	Wencon Hi-Temp, green, 0,5 kg unit (1,1 lb)	812346	75.553.13

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WENCON®

Product Information

General description
Two component solvent free liquid epoxy coating for protection against wear, bimetallic corrosion and chemical aggression at high levels and temperatures.

Surface preparation
The surface must always be clean and degreased

Applying to new steel surface:

- rounding (blunting) with radius 2mm
- shot blasting to SA 2,5
- profile 75 microns

Repairing old steel surface:

- rounding (blunting) with radius 2mm
- shot blasting to SA 2,5
- sweat out water and salts
- profile 75 microns

Mixing Ratio
Mix by volume 1:2. Mix until an even colour is obtained.

Applying
Wencon Coating can be applied by spatula or brush.

Overcoating
Wencon Hi-Temp is a double coat system. The overcoating time can vary from one to three hours depending on temperature. The second coat must be applied whilst the first coat is still tacky. If full curing has occurred a light sandblasting or grinding is necessary prior to the second coat.

Pot Life
Depending on amount mixed and temperature. Mixed in small amounts, the pot life is approximately 20-40 minutes at 20°C (68°F)

Curing time
Curing will take place in 10-24 hours at 20°C. (68°F)

Reduced curing time with infrared
This product is tested with and suitable for infrared curing. Curing with infrared radiation can reduce curing time significantly. Result can vary, depending on circumstances and equipment used.

Machine-ability
After curing the product can be machined just like metal.

Technical Data
Hardness Shore D: 82

Tensile strength: 13,8 N/mm² - 1960 p.s.i. (DIN 53454)

Compressive strength:

Modulus of elasticity: 4284 N/mm² - 610,000 p.s.i. (DIN 53454)

Rcrack: 96 N/mm² - 14,000 p.s.i. (DIN 53454)

Adhesion to steel: 22,40 N/mm2

Specific volume
680 ccm per kilogramme (43,5 cu inch/kg)

Coverage rate
Theoretical: 0,86 kg per m² (0,17 lb/sq. ft.) at 600 microns

Practical: 1,0 kg per m² (0,2 lb/sq. ft.)

Temperature Resistance
Corrosion: 160°C (320°F)

Light load: 220°C (430°F)

As filler: 300°C (570°F)

Chemical Resistance
The coating is resistant to oil, water, saltwater and a wide range of acids and alkalis as well as a range of solvents.

Shelf life
@ 20°C: 3 years (68°F)

Handling Precautions
Read the instructions for use and the Material Safety Data Sheet.

Quality test
Poretest and test of layer thickness can be testet with normal electronic instrument like high voltage and high frequence.

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WENCON®

Product Information

Wencon Putty

The quick curing, ready to use, mouldable, epoxy repair stick

- Cures in 10-20 minutes
- Simple apply procedure with cut and knead
- Patches and seals cracks, leakages and holes
- Strong adhesion to all metal surfaces
- Fully machinable

No. 4 - 01.04.2013

Wencon Putty is a very quick curing, two component, epoxy compound supplied in a practical and easy to use stick format.

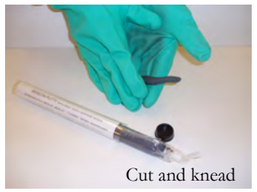
This multipurpose epoxy paste is ideal for wide range of emergency repairs where an ultra quick curing and mouldable compound is required. Typical applications are patching sealing and filling of cracks, leakages and holes in pipes, on flanges, in tanks etc.

The base and activator is co-extruded into a 125g stick. Simply cut off the required amount of repair compound, knead it until an even colour is obtained and apply it to the damaged area. Wencon Putty cures in 10-20 minutes, can be machined after 30 minutes and obtains full mechanical strength after only 2 hours.

Wencon Putty can be machined, drilled and worked like metal after curing.

Wencon Putty exhibits many of the characteristics of metals, which together with a good adhesion to all metallic surfaces makes the repair compound highly suitable for repair of corroded and worn metals.

Wencon Putty is non conducting and can therefore not corrode or bi-metallic corrode. After curing the compound is resistant to oil, water, saltwater and most diluted acids and a range of solvents. Heat resistance ranges from 60° C (140°F) in corrosive and heavy load environments and up to 250° (482°F) C when applied as a filling compound.



Cut and knead

Product numbers:		IMPA no.	ISSA no.
No. 1040	Wencon Putty, 8x125g (8x0,28 lb) unit	812342	75.553.40

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Product Information

General description
Ultra quick curing two component epoxy repair stick.

Surface preparation
The surface must always be as clean, dry and grease free as possible.

Improved adhesion can be obtained by grinding or shot blasting of the surface prior to application.

Mixing Ratio
Cut off the required amount of repair compound and mix until an even colour is obtained. Each stick contains both base and activator.

Applying
After mixing, place the Wencon Putty on the prepared surface and massage or press it into the surface using the fingers. Heat cold items for better adhesion.

REMEMBER TO WEAR GLOVES.

Pot Life
Depending on amount mixed and temperature. Mixed in small amounts, the pot life is approximately 3-6 minutes at 20°C (68°F)

Curing time
Initial setting will take place in 10-20 minutes and the compound is ready for machining in just 30 minutes.

After 2 hours the compound reaches full mechanical strength.

Machine-ability
After curing the product can be machined just like metal

Technical Data
Hardness Shore D: 85

Tensile strength: 4,6 N/mm² - 655 p.s.i. (DIN 53454)

Compressive strength:
Rcrack: 35,14 N/mm² - 5000 p.s.i. (DIN 53454)

Adhesion to steel: 4,50 N/mm2

Specific volume
500 ccm per kilogramme (30 cu inch/kg)

Temperature Resistance

Corrosion:	60°C (140°F)
Light load:	120°C (248°F)
As filler:	250°C (482°F)

Chemical Resistance
The compound is resistant to oil, water, saltwater and most diluted acids and alkalis as well as a range of solvents.

Shelf life
@ 20°C (68°F): 3 years

Handling Precautions
Read the instructions for use and the Material Safety Data Sheet.

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Wencon Pipe Tape

The instant repair bandage for leaking pipes

- Quick and effective to use
- No mixing – No tools
- Water activated
- Ready for use in 10 seconds – Cures in 10 minutes
- Suitable for all pipes and surfaces

No. 4 - 01.04.2013

Wencon Pipe Tape is a fast curing pipe repair bandage especially formulated to make quick and effective repairs of cracks, leaks, fractures, and corrosion porosity in piping carrying water, oil, steam, most gases and even solvents. Wencon Pipe Tape has good pressure, temperature and chemical resistance.

Wencon Pipe Tape is a preimpregnated fibreglass bandage ready for use after soaking in water for 10 seconds. After 10 minutes cure the bandage hardens and the pipe can usually be reactivated. The bandage is fully cured within 1 hour.

The knitted – non-woven fibreglass structure gives the bandage maximum strength and facilitates repairs on corner joints, elbows and other shaped fittings.

Wencon Pipe Tape is available in 3 standard sizes;

• 5x150 cm (2x60 inch.), designed for pipes up to 50 mm (2 inch) diameter

• 5x350 cm, (2x140 inch) designed for pipes up to 125 mm (5 inch) diameter

• 10x350 cm (4x140 inch) designed for pipes up to 200 mm (8 inch) diameter

For larger diameters use a second bandage to complete the repair.

Repairs with Wencon Pipe Tape require no tools. Besides the pipe bandage the package also contains protective gloves and plastic bags for water.

If the pipe can not be emptied or when high pressure repairs are required, Wencon Putty can be used to stop the leakage and reinforce the repair.

The Wencon Pipe Repair Kit contains Wencon Putty as well as repair bandages, gloves and plastic bags.


Soak in water

Product numbers:		IMPA no.	ISSA no.
No. 1045	Wencon Pipe Tape, 5 units (5x150 cm) (2x60 inch)	812344	75.553.30
No. 1046	Wencon Pipe Tape, 4 units (5x350 cm) (2x140 inch)	812348	75.553.31
No. 1044	Wencon Pipe Tape, 2 units (10x350 cm) (4x140 inch)		
No. 1047	Wencon Pipe Repair Kit, 2 units/ (5x150 cm) (2x60 inch) + putty (125gr)		
No. 1048	Wencon Pipe Repair Kit, 5 units/ (5x150 cm) (2x60 inch)+ putty (125gr)		

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WENCON®

Product Information

General Description

Wencon Pipe Tape is a fast curing pipe repair bandage especially formulated to make quick and effective repairs of cracks, leaks, fractures, and corrosion porosity in piping carrying water, oil, steam and most gases and solvents. Wencon Pipe Tape has good pressure, temperature and chemical resistance.

Surface preparation

Prepare the surface by cleaning and abrading the area surrounding the damage.

Degreasing with Wencon Cleaner can improve adhesion.

Mixing Ratio

No mixing is required

Wencon Pipe Tape is pre impregnated with polyurethane resin and is water activated.

Applying

Select the correct size Wencon Pipe Tape.

Prepare the surface by cleaning and grinding the area surrounding the damage.

Stop the leakage with Wencon Putty if necessary.

Unpack the Wencon Pipe Tape and soak it in water for 10 seconds.

Wrap the Wencon Pipe Tape firmly around the pipe with 50% overlap. A minimum of 9 complete windings is recommendable.

Continue to smoothen the surface and to apply pressure to the bandage with a wetted glove, until it stops bobling and starts to cure. This is important for closing the pores.

Pot Life

3-6 minutes depending on air and water temperature.

Curing time

The bandage hardens in 10 minutes and is fully cured within 1 hour at 20°C (68°F)

Machine-ability

No post curing machining necessary

Technical Data

Pipe pressure without Wencon Putty: 10 Bar (145 p.s.i.) *)

Pipe pressure with Wencon Putty: 50 Bar (725 p.s.i.) *)

Flexural strength: ASTM D709 111 N/mmsq.

Tensile strengt: ASTM D638 172 N/mmsq. (15,800 p.s.i.)

Compression strength: ASTM D695 180 N/mmsq. (25,600 p.s.i.)

Adhesion at one-inch single overlap: 19 N/mmsq.

Dielectric strength: 16 KV/mm

Adhesion to steel: 19 N/mm2

Temperature Resistance

Continuous: 120°C (248°F)

Peak: 190°C (374°F)

Chemical Resistance

Water, salt water, oil, diluted acids and alkalis.

Shelf life

@ 20°C: 3 years (68°F)

Handling Precautions

Read the instructions for use and the Material Safety Data Sheet

REMEMBER TO WEAR GLOVES

**) Laboratory tests have shown much higher values, but the mentioned values will count for repairs done in situ. Users are advised to make their own tests if any doubt.*

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No. 4 - 01.04.2013

Wencon Exhaust Repair Kit

The high temperature resistant cold weld exhaust repair product

- Resists temperatures up to 1300° C (2400° F)
- Resists direct flame contact
- Repairs cracks, fills holes and pits
- Quick cure when heated
- One component compound – no mixing, just stir

Wencon Exhaust Repair is a one-component steel cold weld product that can be used to repair cracks and holes in equipment exposed to temperatures up to 1300° C (2400°F)

Typical applications include engine heads, blocks and manifolds, as well as furnaces and boilers. Wencon Exhaust Repair is especially valuable in areas and situations where traditional heat welding cannot be accomplished.

Wencon Exhaust Repair cures to 95% at room temperature within three hours of application. 100% cure can be obtained within 24 hours or in 15 minutes when heat is applied.

Wencon Exhaust Repair can be grinded when cured. The compound has good adhesion on all metal surfaces. Wencon Exhaust Repair will not rust or oxidize and is resistant to chemicals.

The Wencon Exhaust Repair Kit contains:

- Wencon Exhaust Repair Compound, 2 x 250 g (2 x 0,23 lb)
- Reinforcement metal mesh, 10 x 50 cm (4 x 20 inch)
- Spatula
- Application data sheet

Note:

It is important to note, that this product is designed only for external emergency repairs of cracks and leaks.

Product numbers:		IMPA no.	ISSA no.
No. 1070	Wencon Exhaust Repair Kit, 2x250g (2 x 0,23 lb)	812340	75.553.25

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Product Information

General description

One-component cold weld repair compound with high heat resistance.

Surface preparation

The surface must always be as clean, dry and as degreased as possible.

Improved adhesion can be obtained by grinding or shot blasting of the surface prior to application.

Mixing Ratio

No mixing is required. Just stir the contents before use.

Applying

Apply a suitable amount of Exhaust Repair Compound in and around the leak.

Cut reinforcement wire mesh and fix it to the area of the repair. Hold the mesh in place using steel bands or steel wire

Apply a second layer of repair compound and leave for initial curing 3-4 hours.

Heat up slowly to 95°C (200°F) for 15 minutes for full cure.

Curing time

Initial curing 3-4 hours at room temperature.

Full cure at room temperature within 24 hours.

Full cure at 95° C (200°F) approximately 15 minutes.

Machine-ability

After curing the product can be ground.

Specific volume

330 ccm per kilogramme (20,1 cu inch/kg)

Temperature Resistance

Up to 1300°C (2400°F)

Chemical Resistance

The compound is resistant to oil, water, saltwater and most diluted acids and alkalis as well as a range of solvents.

Shelf life

@ 20°C: 3 years (68°F)

Handling Precautions

Read the instructions for use and the Material Safety Data Sheet.

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Wencon UW Cream - wet surface

The excellent cream for applying on wet surfaces or under water, with a very good adhesion.

- Can be applied on wet surfaces or under water
- Cures under water and on wet surfaces
- For filling up cavitation damages
- Long pot-life under water
- Strong adhesion to all metal surfaces

Wencon UW Cream is a two component cream, to be applied on wet surfaces or under water. The UW Cream is excellent for filling up holes, dents and rebuilding of surfaces which, due to high humidity, have to be done in wet conditions.

After curing Wencon UW Cream will exhibit a wide range of the characteristics of metal, which together with a good adhesion makes the system most suitable as a repair compound for repairing corroded and worn metal.

Wencon UW Cream is non conducting and can neither corrode or bi-metallic corrode.

Typical applications are corroded hulls and all underwater parts of ships and structures, tanks, pipes, flange faces, etc. It is also excellent for filling up cavitation damages on hulls and rudders.

After curing Wencon UW Cream is resistant to oil, saltwater, water, most diluted acids and a range of solvents.

Wencon UW Cream has to be mixed above water in the mixing ratio 1:2 by volume. The pot life will be 25-35 minutes, depending on the temperature. Curing will take place in 10-18 hours, depending on the temperature. Curing requires a temperature of minimum 10°C but better at 17-23°C or higher.

Mix 1:2

Product numbers:		IMPA no.	ISSA no.
No. 1014	Wencon UW Cream, 0,5 kg (1,1 lb) unit	812334	75.553.91

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Product Information

General description
Two component solvent free pasty consistency epoxy repair compound, for applying under water or on wet surfaces.

Surface preparation
Before applying, the surface must be clean from loose paint, scales, under water growth, etc. A mechanical cleaning will do, but even better, if possible, hydro jetting.

Mixing ratio
Mix by volume 1:2. Mix until an even colour is obtained. The mixing has to take place above water. After mixing, the product can be taken into the water.

Pot Life
25-35 minutes at 20°C (68°F) depending on amount mixed and the temperature.

Curing time
Curing will take place in 10-18 hours, but only if the temperature allows it to cure. Curing requires a temperature of at least 10°C (50°F), but better at 17-23°C (62-73°F) or higher. If the product has to be exposed to chemicals, let it cure for 7 days, before the exposure.

Reduced curing time with infrared
This product is tested with and suitable for infrared curing. Curing with infrared radiation can reduce curing time significantly. Result can vary, depending on circumstances and equipment used.

Machine-ability
After curing, the product can be machined just like metal.

Technical Data
Hardness Shore D: 79 (DIN 53505)

Tensile strength: 35,8 N/mm² - 5094 p.s.i. (DIN 53454)

Compressive strength:

Modulus of elasticity: 2631 N/mm² - 375,000 p.s.i. (DIN 53454)

Rcrack: 134 N/mm² -19,000 p.s.i. (DIN 53454)

Adhesion to steel: 33 N/mm2

Specific volume
526 ccm per kilogramme (33,6 cu inch/kg)

Temperature resistance
Corrosion and heavy load: 60°C (140°F)

Light load or no load:	100°C (212°F)
As filler:	160°C (320°F)

Chemical resistance
After curing, the Wencon UW Cream will be resistant to oil, water, saltwater, most diluted acids and a range of solvents.

Shelf life
@ 20°C (68°F): 3 years

Handling precautions
Read the instructions for use and the material safety data sheet.

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Wencon UW Coating - wet surface

Excellent liquid coating for applying on wet surfaces or under water, with a very good adhesion.

- Can be applied on wet surfaces or under water
- Cures under water and on wet surfaces
- Efficient double coat system
- Long pot-life under water
- Strong adhesion to all metal surfaces

No. 4 - 01.04.2013

Wencon UW Coating is a two component product, to be applied on wet surfaces or under water. The UW Coating is ideal for repair of ballast- and cooling pipes, in connecton with Wencon reinforcement tape. Excellent for repair jobs which, due to high humidity, have to be done in wet conditions.

After curing, Wencon UW Coating will provide a smooth, nonporous coating, which is resistant to bi-metallic corrosion, light chemical attack, corrosion and impingement.

Wencon UW Coating contains no solvents.

Typical applications are coatings of steel surfaces rebuilt with Wencon UW Cream, and coatings under water - like ships hulls and/or other submerged structures, tanks, pipes etc. Examples of repairs under extreme conditions could be: On-site repair of sea-water filter housings, unable to achieve a dry surface and coating of scratched painting on hulls in splash-zones and under water.

Wencon UW coating has been developed for use in the marine industry and offshore, where it is not possible to apply on a dry surface.

Wencon UW Coating has to be mixed above water in the mixing ratio 1:2, and can be applied under water by spatula, brush or roller. The pot life will be 25-35 minutes, depending on the temperature. Curing will take place in 10-18 hours, depending on the temperature. Curing requires a temperature of minimum 10°C but better at 17-23°C or higher.

Mix 1:2

Product numbers:	IMPA no.	ISSA no.
No. 1035 Wencon UW Coating, 0,5 kg (1.1 lb) unit	812336	75.553.92

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Product Information

General description
Two component solvent free liquid coating, for protection against corrosion and bi-metallic corrosion, erosion as well as impingement. The coating can be applied under water.

Surface preparation
When Wencon UW coating is applied on top of Wencon UW Cream, it has to be applied when the layer of UW Cream is still tacky.

When applying to an old steel surface under water, the surface must be cleaned for loose paint, scales, under water growth, etc. A mechanical cleaning will do, but even better – if possible, use hydro-jetting.

Mixing ratio
Mix by volume 1:2. Mix until an even colour is obtained. The mixing has to take place above water. After mixing, the product can be taken into the water.

Applying
Wencon UW Coating is applied using a spatula, brush or roller. If the temperature is low – use a brush with short bristles. If the temperature is high, use brush with long bristles. The initial wetting of the brush/roller has to take place above water

Over coating
Wencon UW Coating is applied in 2-3 operations. The over coating time depends of the temperature. The second layer has to be applied while the first layer is still tacky. The time will vary from 2-6 hours.

Pot life
25-35 minutes at 20°C (68°F), depending on the amount mixed and the temperature.

Curing time
Curing will take place in 10-18 hours, but only if the temperature allows it to cure. Curing requires a temperature of at least 10°C (50°F), but better at 17-23°C (62-73°F) or higher. If the coating shall be exposed to chemicals, let it cure for 7 days before exposure.

Reduced curing time with infrared
This product is tested with and suitable for infrared curing. Curing with infrared radiation can reduce curing time significantly. Result can vary, depending on circumstances and equipment used.

Machine-ability
After curing, the coating can be machined just like metal.

Technical Data
Hardness Shore D: 79 (DIN 53505)

Tensile strength: 37,5 N/mm² - 5336 p.s.i. (DIN 53454)

Compressive strength:

Modulus of elasticity: 3117 N/mm² - 443,000 p.s.i. (DIN 53454)

R_{crack}: 133 N/mm² -19,000 p.s.i. (DIN 53454)

Adhesion to steel: 31,90 N/mm2

Specific volume
535 ccm per kilogramme (34,2 cu inch./kg)

Chemical resistance
After curing, the Wencon UW Coating will be resistant to oil, water, saltwater, most diluted acids and a range of solvents.

Temperature resistance
Corrosion or heavy load: 60°C (140°F)

Light or no load: 100°C (212°F)

As filling compound: up to 160°C (320°F)

Coverage rate
Approximately 2 sq. m. per kg per coat. (0,4 lb/sq. ft)

Shelf life
@ 20°C (68°F): 3 years

Handling precautions
Read the instruction for use and the Material Safety Data Sheet.

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No. 2 - 01.04.2013

Wencon UW Putty - wet surface

The excellent putty for applying on wet surfaces or under water, with a very good adhesion.

- Can be applied on wet surfaces or under water
- Cures under water and on wet surfaces
- Stop leaking pipes and tanks
- Long pot-life under water
- Strong adhesion to all metal surfaces

Wencon UW Putty is a two component product to be applied on wet surfaces or under water. The UW Putty is developed for repairs, where you need to apply bigger quantities in one process.

After curing Wencon UW Putty will exhibit a wide range of the characteristics of metal, which together with a good adhesion makes the system most suitable as a repair compound for repairing corroded and worn metal.

Wencon UW Putty is non conducting and can neither corrode or bi-metallic corrode.

Typical applications are filling corroded hulls and all under water parts of vessels and structures. Also used to stop leaking tanks and pipes etc., filling gaps and holes under water or on wet surfaces before completion with UW Cream/UW Coating.

After curing Wencon UW Putty is resistant to oil, saltwater, water, most diluted acids and a range of solvents.

Wencon UW Putty has to be mixed above water in the mixing ratio 1:1 by volume. The pot life is approximately 60 minutes, depending on the temperature. Curing will take place in 12-18 hours, depending on the temperature. Curing requires a temperature of minimum 10°C.

Mix 1:1

Product numbers:

		IMPA no.	ISSA no.
No. 1043	Wencon UW Putty 1 kg (2,2 lb) unit	812591	N/A

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Product Information

General description
Two component solvent free pasty consistency epoxy repair compound, for applying under water or on wet surfaces.

Surface preparation
Before applying, the surface must be clean from loose paint, scales, under water growth, etc. A mechanical cleaning will do, but even better, if possible, hydro jetting.

Mixing ratio
Mix by volume 1:1. Mix until an even colour is obtained. The mixing has to take place above water. After mixing, the product can be taken into the water.

Applying
Start mixing the product 1:1 on a mixing plate. Then continue in your hands, wearing wet protection gloves.

Mix until the product has an even colour without any “stripes”, and press/rub the Putty hard against the surface either by hand or by using a spatula.

Pot Life
Approximately 60 minutes at 20°C (68°F) depending on amount mixed and the temperature.

Curing time
Curing will take place in 12-18 hours, but only if the temperature allows it to cure. Curing requires a temperature of at least 10˚C (50˚F).

Reduced curing time with infrared
This product is tested with and suitable for infrared curing. Curing with infrared radiation can reduce curing time significantly. Result can vary, depending on circumstances and equipment used.

Machine-ability
After curing, the product can be machined just like metal.

Technical Data
Hardness Shore D: 66

Tensile strength:11,5 N/mm² - 1636 p.s.i. (DIN 53454)

Compressive strength

Modulus of elasticity: 563 N/mm² - 80,000 p.s.i. (DIN 53454)

Rcrack: 89 N/mm² - 13.000 p.s.i. (DIN 53454)

Adhesion to steel: 15,90 N/mm2

Specific volume
629 ccm per kilogramme (40,2 cu inch/kg)

Temperature resistance

Corrosion and heavy load:	60°C (140°F)
Light load or no load:	100°C (212°F)
As filler:	160°C (320°F)

Chemical resistance
After curing, the Wencon UW Putty will be resistant to oil, water, saltwater, most diluted acids and a range of solvents.

Shelf life
@ 20°C (68°F): 3 years

Handling precautions
Read the instructions for use and the material safety data sheet.

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No. 2 - 01.04.2013

Wencon Ceramic Cream

The epoxy compound for repair and rebuilding of deteriorated metal parts, exposed to excessive wear.

- Strong adhesion to all metal surfaces
- High wear resistance
- High temperature resistance
- Easy mixing and application
- High abrasion resistance

Wencon Ceramic Cream is a basic two-component, epoxy compound with a wide range of applications for repair and rebuilding of worn, damaged, cracked and corroded metal parts.

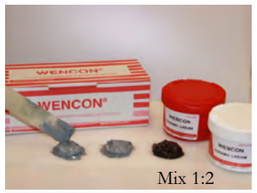
Wencon Ceramic Cream has a high abrasion resistance, making it suitable for applications on propeller nozzles, rudders, thruster tunnels and housings. In addition, the product also offer high temperature resistance, which makes it ideal for applications on gas scrubbers, condensers and end-covers.

Wencon Ceramic Cream exhibits many of the characteristics of metals, which together with outstanding adhesion to all metallic surfaces makes the repair compound highly suitable for repair of corroded and worn metals.

Wencon Ceramic Cream is non conducting and can therefore not corrode or bi-metallic corrode. After curing the compound is resistant to oil, water, saltwater and most diluted acids and a range of solvents. Heat resistance ranges from 200° C (392° F) in corrosive and heavy load environments and up to 300° C (572°F) when applied as a filling compound.

Wencon Ceramic Cream has a paste consistency and is easily applied by spatula also to vertical surfaces.

Wencon products are designed to be simple to use and cost effective. Easy mixing ratios (1:2 by volume) reduce waste to a minimum and high specific volumes give high coverage rates.



Mix 1:2

Product numbers:		IMPA no.	ISSA no.
No. 1016	Wencon Ceramic Cream, 1 kg (2,2 lb) unit	812592	N/A

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Product Information

General description

Two component solvent free paste consistency epoxy repair compound for rebuilding of deteriorated metal parts, exposed to excessive wear.

Surface preparation

The surface must always be clean and degreased

Applying to new steel surface:

- shot blasting to SA 2,5
- if shot blasting is not possible use grinding
- after grinding the surface must be degreased with Wencon Cleaner

Repairing old steel surface:

- shot blasting to SA 2,5
- sweat out water and salts
- shot blasting to SA 2,5 again
- profile 75 microns

Mixing Ratio

Mix by volume 1:2. Mix until an even colour is obtained.

Applying

Wencon Ceramic Cream can be applied by spatula.

Pot Life

Depending on amount mixed and temperature. Mixed in small amounts, the pot life is approximately 30-40 minutes at 20°C (68°F)

Curing time

Curing will take place in 10-15 hours at 20°C (68°F)

Reduced curing time with infrared

This product is tested with and suitable for infrared curing. Curing with infrared radiation can reduce curing time significantly. Result can vary, depending on circumstances and equipment used.

Technical Data

Hardness Shore D: 80 (DIN 53505)

Tensile strength: 25,8 N/mm² - 3671 p.s.i. (DIN 53454)

Compressive strength:

Modulus of elasticity: 2799 N/mm² - 398.000 p.s.i. (DIN 53454)

Rcrack: 65 N/mm² -9.500 p.s.i. (DIN 53454)

Adhesion to steel: 30,80 N/mm2

Abrasion Resistance (Taber wear test): 25.6 (ISO 7784-1)

Specific volume

538 ccm per kilogramme (34,4 cu inch/kg)

Temperature Resistance

Corrosion:	200°C (392° F)
Light load:	250°C (482°F)
As filler:	300°C (572°F)

Chemical Resistance

The compound is resistant to oil, water, saltwater and most diluted acids and alkalis as well as a range of solvents.

Shelf life

@ 20°C (68°F): 3 years

Handling Precautions

Read the instructions for use and the Material Safety Data Sheet.

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No. 2 - 01.04.2013

Wencon Ceramic Coating

The versatile and cost effective coating product for general repair, maintenance and protection of surfaces, exposed to excessive wear.

- Strong adhesion to all metal surfaces
- High wear resistance
- High temperature resistance
- Efficient double coat system
- High coverage rate

Wencon Ceramic Coating is a two-component, liquid epoxy coating suitable for a wide range of applications. It provides a smooth non porous surface, which is resistant to bi-metallic corrosion, light chemical aggression, corrosion and erosion as well as impingement.

Typical applications are coating of surfaces rebuild after deterioration and protection against wear, corrosion and bi-metallic corrosions. Wencon Ceramic Coating has a high abrasion resistance, making it suitable for applications on propeller nozzles, rudders, thruster tunnels and housings. In addition, the product also offer high temperature resistance, which makes it ideal for applications on gas scrubbers, condensers and end-covers.

Wencon Ceramic Coating offers resistance to oil, water, saltwater and most diluted acids and alkalis as well as a range of solvents. Heat resistance ranges from 220° C (428°F) in corrosive and heavy load environments and up to 320° C (608°F) when applied as a filling compound.

Wencon Ceramic Coating is a double coat system and is consequently supplied in two different colours, brown and green. The product is liquid and is applied by brush, roller or spatula.

The Wencon products are designed to be simple to use and cost effective. Easy mixing ratio (1:2 by volume) reduce waste to a minimum and high specific volumes give high coverage rates.

Mix 1:2

Product numbers:		IMPA no.	ISSA no.
No. 1017	Wencon Ceramic Coating, brown 0,5 kg (l,l lb)	812593	N/A
No. 1018	Wencon Ceramic Coating, green 0,5 kg (l,l lb)	812594	N/A

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WENCON®

Product Information

General description

Two component solvent free liquid epoxy coating for general repair, maintenance and protection of surfaces exposed to excessive wear.

Surface preparation

The surface must always be clean and degreased

Applying to new steel surface:

- rounding (blunting) with radius 2mm
- shot blasting to SA 2,5
- profile 75 microns

Repairing old steel surface:

- rounding (blunting) with radius 2mm
- shot blasting to SA 2,5
- sweat out water and salts
- profile 75 microns

Mixing Ratio

Mix by volume 1:2. Mix until an even colour is obtained.

Applying

Wencon Ceramic Coating can be applied by spatula or brush.

Overcoating

Wencon Ceramic Coating is a double coat system. The overcoating time can vary from one to three hours depending on temperature. The second coat must be applied whilst the first coat is still tacky. If full curing has occurred a light sandblasting or grinding is necessary prior to the second coat

Pot Life

Depending on amount mixed and temperature. Mixed in small amounts, the pot life is approximately 20-30 minutes at 20°C (68°F)

Curing time

Curing will take place in 10-15 hours at 20°C. (68°F)

Reduced curing time with infrared

This product is tested with and suitable for infrared curing. Curing with infrared radiation can reduce curing time significantly. Result can vary, depending on circumstances and equipment used.

Technical Data

Hardness Shore D: 81
Tensile strength: 25,4 N/mm² - 3614 p.s.i. (DIN 53454)

Compressive strength

Modulus of elasticity: 3030 N/mm² - 431,000 p.s.i. (DIN 53454)

Rcrack: 124 N/mm² - 18,000 p.s.i. (DIN 53454)

Adhesion to steel: 28,90 N/mm2

Abrasion Resistance (Taber wear test): 21.9 (ISO 7784-1)

Specific volume

658 ccm per kilogramme (42 cu inch/kg)

Coverage rate

Theoretical: 0,91 kg per m² (0,19 lb/sq. ft.) at 600 microns

Practical: 1,2 kg per m² (0,25 lb/sq. ft.)

Temperature Resistance

Corrosion:	220°C (428°F)
Light load:	260°C (500°F)
As filler:	320°C (608°F)

Chemical Resistance

The coating is resistant oil, water, saltwater, most diluted acids and a range of solvents

Shelf life

@ 20°C: 3 years (68°F)

Handling Precautions

Read the instructions for use and the Material Safety Data Sheet.

Quality test

Poretest and test of layer thickness can be testet with normal electronic instrument like high voltage and high frequence

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Wencon Accessories

The complementary range of products and tools required for a successful application.

- Wencon Cleaner
- Wencon Release Agent
- Wencon Reinforcement Tape
- Wencon Aggregate
- Wencon Mixed Filler
- Wencon Application Tools

No. 4 - 01.04.2013

Wencon Accessories are high quality products carefully selected and designed to contribute to make your repair application successful. During an emergency repair, or when planning a scheduled repair or maintenance job, it is important to make sure that you have all the necessary components, tools and aids required at hand before you start.

The application data sheet in the Wencon Repair Manual clearly lists all the products required for the individual application.

The degreasing agent (Wencon Cleaner) that guarantees you the best possible adhesion to surface and the greasy cream (Wencon Release Agent) that makes sure that the compound or coating does not adhere, where it is not suppose to.

Sometimes you need to strengthen your repair, by combining the repair compound or coating with a bandage (Wencon Reinforcement Tape) or with a wear resistant granulate (Wencon Aggregate).

Wencon Mixed Filler is a custommade filler to be mixed with epoxy products, if you need to improve durability, such as in Water jets or Suction Wells.

Finally, having the right tools for mixing and applying (Wencon Application Tools) will also contribute to a quick and successful repair application.

Product numbers:

		IMPA no.	ISSA no.
No. 1100	Wencon Cleaner, 0,5 litre unit	812349	75.553.01
No. 1110	Wencon Release Agent, 50 g unit (0,07 lb)	812350	75.553.60
No. 1120	Wencon Reinforcement Tape 0,05 x 10 m (400 inch)	812339	75.553.50
No. 1122	Wencon Reinforcement Tape 0,10 x 20 m (800 inch)	N/A	N/A
No. 1140	Wencon Aggregate No. 16, 1,5 kg unit (3,3 lb)	N/A	N/A
No. 1150	Wencon Aggregate No. 24, 1,5 kg unit (3,3 lb)	N/A	N/A
No. 2805	Wencon Application Tools	812595	75.553.80
No. 1170	Wencon Mixed Filler	N/A	N/A

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Product Information

Wencon Cleaner
General description

Wencon Cleaner is a tetrachloroethylene based degreasing agent, which is used for cleaning purposes prior to application of the Wencon repair compounds and coatings.

Handling precautions

Wencon Cleaner is non-flammable.

Use only in large or well ventilated rooms.

Read the instructions for use and the Material Safety Data Sheet

Wencon Reinforcement Tape
General description

Wencon Reinforcement Tape is a flexible fibre tape used for reinforcing repairs made with Wencon Cream, Rapid, Coating or Hi-Temp.

Typical applications include pipe repairs, cracks or holes in engine blocks, oil sumps, etc.

Wencon Release Agent
General description

Wencon Release agent is used in applications where you want to prevent adhesion between the Wencon repair compound, coating or putty and the substrate.

Wencon Mixed Filler
General description

Wencon Mixed Filler is a custommade filler to be mixed with epoxy products. The Mixed Filler contains 1/3 Silicon Carbide P100, 1/3 Silicon Carbide P280, 1/3 Zirkon Korund 0,2 - 0,4. Weight 850gr.

Wencon Aggregate
General description

Wencon Aggregates are silica carbide based granulates, which are used for both non-slip surfacing and for wear resistant coating applications.

Wencon Aggregate can be mixed with Wencon Cream, Rapid, Coating or Hi-Temp.

Wencon Aggregate is supplied in two different types:

- No. 16 coarse granulates
- No. 24 fine granulates

Wencon Application Tools
General description

Wencon Application Tools are quality products regularly used in connection with mixing and application of Wencon repair products.

The kit contains:

- 4 spatulas for application of compounds and coatings.
- 4 brushes for application of coatings.
- 4 mixing knives for mixing of Wencon two component.
- 1 pair of scissors for cutting Wencon Reinforcement Tape, Pipe Tape and other soft material.
- 4 pairs of nitrile-gloves.

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WENCON®

Product Information

Wencon Repair Kits for Marine

Wencon Repair Kits are available in different sizes, depending on the size and age of the vessel.
Covers most aspects of emergency repairs and long lasting maintenance. Suitable for all ships, where repairs and maintenance are carried out frequently.
This on-board first aid kit contains a technical manual with detailed application data sheets, which support you fully with repairs, planned maintenance and improvements on board the vessel.

No. 5 - 01.03.2014

Product No.	The 4 standard Wencon Repair Kit contains:	Kit 1	Kit 2	Kit 3	Kit 4	Your kit
1010	Wencon Cream, 1 kg	1 set				
1000	Wencon Rapid, 1 kg	1 set	1 set			
1005	Wencon Rapid, 8 x 125 g	1 set	1 set	1 set	1 set	
1020	Wencon Coating, white, 0,5 kg	2 set	1 set	1 set		
1030	Wencon Coating, blue, 0,5 kg	2 set	1 set	1 set		
1050	Wencon Hi-Temp, yellow, 0,5 kg	1 set				
1060	Wencon Hi-Temp, green, 0,5 kg	1 set	1 set	1 set		
1040	Wencon Putty, 8 x 125 g	1 set	1 set	1 set	1 set	
1044	Wencon Pipe Tape 2 unit, 10 x 350 cm					
1045	Wencon Pipe Tape 5 unit, 5 x 150 cm	1 set	1 set	1 set	1 set	
1046	Wencon Pipe Tape 4 unit, 5 x 350 cm	1 set	1 set			
1070	Wencon Exhaust Repair Kit, 2 x 250 g	1 set	1 set	1 set	1 set	
1014	Wencon UW Cream, 0,5 kg	1 set				
1035	Wencon UW Coating, 0,5 kg	1 set				
1043	Wencon UW Putty, 1 kg					
1016	Wencon Ceramic Cream, 1 kg					
1017	Wencon Ceramic Coating, brown 0,5 kg					
1018	Wencon Ceramic Coating, green, 0,5 kg					
1100	Wencon Cleaner, 0,5 l	3 set	2 set	1 set	1 set	
1110	Wencon Release Agent, 30 g	1 box	1 box	1 box	1 box	
1120	Wencon Reinforcement Tape, 5 cm	3 roll	2 roll	2 roll	1 roll	
1122	Wencon Reinforcement Tape, 10 cm					
1150	Wencon Aggregate No. 24, 1,5 kg					
2805	Wencon Application Tools	1 set	1 set	1 set	1 set	
	Wencon Manual	1 nos.	1 nos.	1 nos.	1 nos.	
1250	Perago single					
1252	Perago duo					
1254	Perago tris					
	Plywood Box	1 large	1 medium	1 small	1 small	

The Wencon Repair Manual is available for free download from our web page, in different languages.
The manual contains application datasheets for several repair jobs, technical data sheets and instruction for use, as well as detailed information about surface preparation.
The Wencon Repair Kit is supplied in a strong plywood box suitable for shipping and storage on board.

Product numbers:		IMPA no.	ISSA no.
No. 8700	Wencon Repair Kit No. 1	812341	75.553.70
No. 8704	Wencon Repair Kit No. 2	812331	75.553.71
No. 8708	Wencon Repair Kit No. 3	812332	75.553.72
No. 8712	Wencon Repair Kit No. 4	812333	75.553.73

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WENCON PRODUCTS

No. 1010 Wencon Cream, 1 kg unit IMPA No. 812335 ISSA No. 75.553.20
Wencon Cream is a basic two-component, epoxy compound with a wide range of applications for repair and rebuilding of worn, damaged, cracked and corroded machine and metal parts. Typical applications are corroded tanks, pump housings, impellers, valves, pipes, flange faces, roller bearing seats, worn shafts, hydraulic rams and heat exchangers.

No. 1000 Wencon Rapid, 1 kg unit IMPA No. 812347 ISSA No. 75.553.21
No. 1005 Wencon Rapid 8, 8x125 g unit IMPA No. 812343 ISSA No. 75.553.22
Wencon Rapid is a fast curing, two-component, epoxy compound with a wide range of applications for emergency repairs and maintenance. Typical applications as for Wencon Cream.

No. 1020 Wencon Coating, white, 500 g unit IMPA No. 812337 ISSA No. 75.553.10
No. 1030 Wencon Coating, blue, 500 g unit IMPA No. 812338 ISSA No. 75.553.11
Wencon Coating is a two-component, liquid epoxy coating suitable for a wide range of applications. Typical applications are coating of surfaces rebuilt after deterioration, protection of tanks, pumps, valves, wet liners, cooler end covers etc. against corrosion and bi-metallic corrosion.

No. 1050 Wencon Hi-Temp, yellow, 500 g unit IMPA No. 812345 ISSA No. 75.553.12
No. 1060 Wencon Hi-Temp, green, 500 g unit IMPA No. 812346 ISSA No. 75.553.13
Wencon Hi-Temp is a high performance two-component, liquid epoxy coating developed for applications in high load areas.

No. 1040 Wencon Putty, 8x125 g unit IMPA No. 812342 ISSA No. 75.553.40
Wencon Putty is a very quick curing, two component, epoxy compound supplied in a practical and easy to use stick format. This multipurpose epoxy paste is ideal for wide range of emergency repairs where an ultra quick curing and mouldable compound is required.

No. 1044 Wencon Pipe Tape, 2 units (10x350 cm)
No. 1045 Wencon Pipe Tape, 5 units (5x150 cm) IMPA No. 812344 ISSA No. 75.553.30
No. 1046 Wencon Pipe Tape, 4 units (5x350 cm) IMPA No. 812348 ISSA No. 75.553.31
Wencon Pipe Tape is a fast curing pipe repair bandage especially formulated to make quick and effective repairs of cracks, leaks, fractures, and corrosion porosity in piping carrying water, oil, steam, most gases and even solvents.

No. 1070 Wencon Exhaust Repair Kit, 2x250g IMPA No. 812340 ISSA No. 75.553.25
Wencon Exhaust Repair is a one component steel cold weld product that can be used to repair cracks and holes in equipment that is exposed to temperatures up to 1300° C. Typical applications include engine heads, blocks and manifolds, as well as furnaces and boilers.

No. 1014 Wencon UW Cream, 500 g unit IMPA No. 812334 ISSA No. 75.553.91
Special epoxy based cream for applying under water or direct on wet surfaces.

No. 1035 Wencon UW Coating, 500 g unit IMPA No. 812336 ISSA No. 75.553.92
Special epoxy based coating for applying under water or direct on wet surfaces.

No. 1043 Wencon UW Putty, 1 kg unit IMPA No. 812591 ISSA No. N/A
Special epoxy based putty for applying under water or direct on wet surfaces, typical applications are corroded hulls and under water parts of vessels, structures, tanks, pipes, flange faces etc.

No. 1016 Wencon Ceramic Cream, 1 kg unit IMPA No. 812592 ISSA No. N/A
Epoxy compound for repair and rebuilding of deteriorated metal parts exposed to excessive wear

No. 1017 Wencon Ceramic Coating brown, 500g unit IMPA No. 812593 ISSA No. N/A
No. 1018 Wencon Ceramic Coating green, 500g unit IMPA No. 812594 ISSA No. N/A
The cost effective coating product for general repair, maintenance and protection of surfaces exposed to excessive wear.

No. 1100 Wencon Cleaner, 0,5 litre unit IMPA No. 812349 ISSA No. 75.553.01
Degreasing agent used prior to application of epoxy compounds and coatings.

No. 1110 Wencon Release Agent, 30 g unit IMPA No. 812350 ISSA No. 75.553.60
Special grease used to prevent adhesion of epoxy compounds and coatings.

No. 1120 Wencon Reinforcement Tape, 0,05 x 10 m IMPA No. 812339 ISSA No. 75.553.50
No. 1122 Wencon Reinforcement Tape, 0,10 x 20 m IMPA No. N/A ISSA No. N/A
Fiber tape used for reinforcing repairs made with epoxy compounds and coatings.

No. 1150 Wencon Aggregate No. 24, 1,5 kg IMPA No. N/A ISSA No. N/A
Silica carbide based granulates for non-slip surfacing and wear resistant coating applications.

No. 2805 Wencon Application Tools IMPA No. 812595 ISSA No. 75.553.80
Selection of tools for use when mixing and applying of Wencon repair products.

Wencon Perago

The Wencon Perago rotating blasting disc is a product for removal of rust, epoxy, layers of dirt like glue, paint etc.

- Excellent surface preparation
- Needle hammering with electric drill
- Best alternative to blasting
- Easy to use
- Long durability/service life

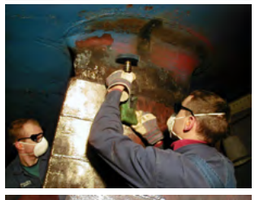
Perago is a rotating disc for removal of rust, dirt, paint, epoxy etc. from various materials, such as steel, iron, metals, stone and concrete. The result after surface preparation with Perago is almost the same as with shotblasting and the best way of surface preparation when blasting is not possible.

The Perago is a rubber disc with 12 steel pins vulcanised in it. In the middle of the Perago disc is an ax, for use in a handdrilling machine. The steel pins are made of special hard metal steel pins, mounted with conical shape. The disc is made of 96% natural rubber and is, due to that, very flexible. When the disc is rotating the pins are moving in different directions and the Perago pins will hammer directly on the surface. The result is like a sandblasted surface with the appropriate texture suitable for the application of a new protective coating. The hammer effect creates no heat, so tough materials such as tar, adhesives and sealants will be easily removed.

The best result is achieved at 2500-3000 rpm. At a lower rpm the effect will be less, but the disc will then become more flexible and gives the opportunity to reach difficult places like corners. In this situation 1200 rpm is recommended.

The Perago discs are available as Single, Duo and Triss discs for handdrilling machines.

The Single disc is for use at small surfaces and in corners. Duo and Triss discs are for use at bigger surfaces.



Product numbers:		IMPA no.	ISSA no.
No. 1250	Perago Single, Metal	-	-
No. 1252	Perago Duo, Metal	-	-
No. 1254	Perago Triss, Metal	-	-

WENCON®

Product Information

No. 3 - 01.04.2013

Technical Specification

Size:

Disc Diameter:	126mm + / - 0.8mm
Disc Thickness:	6.7mm + / - 0.3mm
Stud Record:	8 mm

Material:

Rubber:	Natural rubber with binder and 50 Shore A hardness.
Tungsted Carbide / Hard Metal:	Hardness 1500HV

Use and safety:

- ALWAYS wear safety goggles, working gloves, dust mask and protective clothing
- Maximum speed 4000 rpm
- Recommended speed between 2500 and 3000 rpm; DIRECTION = clockwise
- Disc should never be used on: edges, raised surfaces etc.

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Index - Chapter 2

General Application Specification Sept. 2012

General specification for the use of Wencon systems for refurbishing and/or preserving metal structures.

The **WENCON** products are used for refurbishing and/or preventive coating of pumps, valves, coolers, heat exchangers, pipes, tanks, filters, strainers, etc. (See Chapter 5 in the WENCON Manual, Internet: www.wencon.com)
The system is built in three layers.
First layer is the actual rebuilding of the deteriorated surface Fig. 1. If the machine part is new, you can leave out this first layer.
The two next layers consist of a coating that shall prevent the substrate from being deteriorated again in the near future. Normal paint will protect metal surfaces for a few months, the WENCON coatings will protect for many years. Fig. 2 and 3.

First layer.
First layer is applied in order to retain the original thickness and/or shape of the surface of the deteriorated machine part. The actual product, used for this application depends on the situation. Basically there are three options: Wencon Cream, for standard applications, Wencon UW Cream for under water applications and Wencon Ceramic Cream for abrasion resistant applications.

Second and third layer.
The two layers of coating, that shall be applied wet in wet, just after the previous layer has semi cured, but still tacky, shall be chosen among the variety of Wencon Coatings. The parameters that helps you choose, will be temperature, above or under water, abrasion condition, chemical condition, spray or brush applying, etc. Use the Wencon Manual to find the right Coating for the job, or ask your Wencon representative.

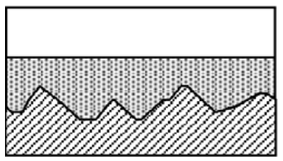
fig. 1

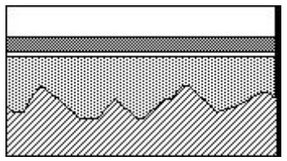
fig. 2

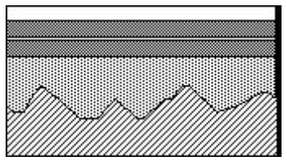

fig. 3

Surface preparation acc. to ISO 12944
Before any application can take place, the surface must be prepared. The adhesion of the chosen Wencon product depends on the surface preparation. However, the situation indicates what is possible and what is needed. Here will be given the full range of the surface preparation.

Shotblasting. Shotblast the area to be treated to min.SA 2,5 acc. to ISO 12944
Test the surface for salt content acc. to ISO 12944. Remove salt if any.
Round any sharp edges to radius 3 mm
Apply heat if item is too cold to stay dry during the operation (see: conditions for application below)
Repeat the shot blasting to min. SA 2,5 with a sharp profile of min. 75 µ acc. to ISO 12944

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Instruction for use

Conditions for application.
The temperature of the item and the climatic conditions must be prepared, so the surface at any time during the application and the curing of the Wencon products is min. 3 degrees above dew point, acc. to ISO 12944.

Apply the chosen Wencon products according to specification and instructions for use.

Quality control.
Each application shall be checked after curing, in order to examine the quality of the job. Even small failures, that are easy to correct just after the application, may have huge effect on the result of the job.

Visual check.
Check carefully for visual defects, areas, where the last coat is missing, or the like.

Thickness test.
In order to verify, that the minimum required layer thickness is obtained, a NDT test shall be carried out with a thickness tester. This will tell you the total thickness of the Wencon layers. In some areas, the tester may not give a value. This may very well be because the total thickness of the Wencon products exceeds the measuring capacity of the measuring equipment.

Pore test.
A pore test will reveal weak spots in the coating, most often arising from air entrapment in the coating. Basically, there are two types of pore testers, low voltage, wet sponge equipment, and high voltage metal brush equipment.

Adhesion test.
A Dyna pull test (ISO 12944) can be made to control the adhesion of the Wencon system used.

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Wencon Cream

General Description

Wencon Cream is a two-component product, curing at room temperature. After curing, Wencon Cream will exhibit a wide range of the characteristics of metals, which together with outstanding adhesion makes the system most suitable as a repair compound for repairing corroded and worn metal. Wencon Cream is non conducting and can neither corrode nor bi-metallic corrode.

Typical applications are corroded tanks, pump housings and impellers, valves, tubes, pipes, heat exchangers, flange faces, roller bearing seats, worn shafts, hydraulic rams, keyways, etc. It is also excellent for filling gaps.

Surface Preparation

Before applying, the surface must be clean. If possible shot blasted to Swedish Standard SA 2 1/2. Where impregnation of oil or salt is possible, the item is either left for 10-20 hours or heated to 30-40°C (86-104°F) in order to sweat out the oil or salt. Then the shot blasting is repeated. In some applications sandblasting is not possible and thorough grinding must take place to clean metal.

N.B. Steel brushing is not advisable as it gives a smooth surface. After grinding Wencon Cleaner is used for degreasing.

Mixing Ratio

Mixing ratio 1:1 by volume. Mix until even color is obtained.

Pot Life

30 - 60 minutes at 20°C (68°F), depending on amount.

Applying

Wencon Cream is applied using the spatula supplied with the kit.

Curing

Curing time depends on the temperature and the thickness applied. At 20°C (68°F) 10 -15 hours. If faster curing is required, heat can be added. At 100°C (212°F) curing time is reduced to 15-20 minutes.

Machinability

After curing the Wencon Cream can be machined, drilled, etc. like metal.

Chemical Resistance

After curing, the Wencon Cream will be resistant to oil, water, saltwater, most diluted acids and a range of solvents.

Temperatur Resistance

Corrosion and heavy load:	60°C (140°F)
Light or no load:	120°C (248°F)
As filling compound	up to 250°C (482°F)

Specific Volume

775 ccm/kg (49,5 cu inch/kg)

Hardness

Shore D 75.

Handling Precautions

Read the instructions on the pack and the Material Safety Data Sheet.

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Wencon Rapid

General Description

Wencon Rapid is a fast curing, two-component product, curing at room temperature. After curing, Wencon Rapid will exhibit a wide range of the characteristics of metals, which together with outstanding adhesion makes the system most suitable as a repair compound for repairing corroded and worn metal. Wencon Rapid is non conducting and can neither corrode nor bi-metallic corrode.

Typical applications are corroded tanks, pump housings and impellers, valves, tubes, pipes, heat exchangers, flange faces, roller bearing seats, worn shafts, hydraulic rams, keyways, etc. It is also excellent for filling gaps.

Surface Preparation

Before applying, the surface must be clean. If possible shotblasted to Swedish Standard SA 2 1/2. Where impregnation of oil or salt is possible, the item is either left for 10-20 hours or heated to 30-40°C (86-104°F) in order to sweat out the oil or salt. Then the sandblasting is repeated. In some applications sandblasting is not possible and thorough grinding must take place to clean metal.

N.B. Steelbrushing is not advisable as it gives a smooth surface. After grinding Wencon Cleaner is used for degreasing.

Mixing Ratio

Mixing ratio 1:1 by volume. Mix until even color is obtained.

Pot Life

10-20 minutes at 20°C (68°F), depending on amount.

Applying

Wencon Rapid is applied using the spatula supplied with the kit.

Curing

Curing time depends on the temperature and the thickness applied. At 20°C (68°F) 40-90 minutes. If faster curing is required, heat can be added. At 100°C (212°F) curing time is reduced to 10-15 minutes.

Machinability

After curing the Wencon Rapid can be machined, drilled, etc. like metal.

Chemical Resistance

After curing, the Wencon Rapid will be resistant to oil, water, saltwater, most diluted acids and a range of solvents.

Temperatur Resistance

Corrosion and heavy load:	60°C (140°F)
Light or no load:	120°C (248°F)
As filling compound: up to	250°C (482°F)

Specific Volume

709 ccm/kg. (45,3 cu inch/kg)

Hardness

Shore D 81.

Handling Precautions

Read the instructions on the pack and the Material Safety Data Sheet.

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Wencon Coating

General Description

Wencon Coating is a two-component product, curing at room temperature. After curing, Wencon Coating will provide a smooth non-porous coating, which is resistant to bi-metallic corrosion, light chemical attack, corrosion and impingement. Wencon Coating contains no solvents.

Typical applications are coating of surfaces rebuilt with Wencon Cream or Rapid, coating of new tanks, pumps, valves, wet liners, cooler end covers and other items to be protected against corrosion and bi-metallic corrosion.

Surface Preparation

Before applying, the surface must be clean. If possible shot blasted to Swedish Standard SA 2 1/2. Where impregnation of oil or salt is possible, the item is either left for 10-20 hours or heated to 30-40°C (86-104°F) in order to sweat out the oil or salt. Then the sandblasting is repeated. In some applications sandblasting is not possible and thorough grinding must take place to clean metal. N.B. Steelbrushing is not advisable as it gives a smooth surface. After grinding Wencon Cleaner is used for degreasing.

Mixing Ratio

Mixing ratio 1:2 by volume. Mix the contents of the two tubs until an even colour is reached.

Pot Life

20-30 minutes at 20°C (68°F), depending on amount.

Applying

Wencon Coating is applied using the spatula supplied with the kit or a brush with half the length of the bristles cut away.

Overcoating

Wencon Coating is applied in two operations. It is therefore supplied in two different colours, white and blue. The overcoating time depends on the temperature. The second coat must be applied whilst the first coat is still tacky. The time will vary from one to two hours. If full curing has occured a light shot blasting is necessary prior to the second coat.

Curing

Curing will take place in 10-48 hours. If the coating shall be exposed to chemicals, let it cure for 7 days before the exposure.

Machine-ability

After curing the Wencon Coating can be machined, drilled, etc. like metal.

Chemical Resistance

After curing, the Wencon Coating will be resistant to oil, water, saltwater, most diluted acids and a range of solvents.

Temperatur Resistance

Corrosion and heavy load:	60°C (140°F)
Light or no load:	120°C (248°F)
As filling compound:	up to 250°C (482°F)

Specific Volume

730 ccm/kg. (46,7 cu inch/kg)

Coverage

1 kg/m^2 (0,2 lb/sq. ft.) in 600 micron.

Hardness

Shore D 80.

Handling Precautions

Read the instructions on the pack and the Material Safety Data Sheet.

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Wencon Hi-Temp

General Description

Wencon Hi-Temp is a two-component product curing at room temperature. After curing the Wencon Hi-Temp will provide a smooth non porous coating, which is resistant to bi-metallic corrosion, medium chemical attack, corrosion and erosion and impingement. Wencon Hi-Temp contains no solvents.

Typical applications are coating of surfaces rebuilt with Wencon Cream, coating of new tanks, pipes, pumps, valves, wet liners, cooler end covers and other parts exposed to temperatures up to 160°C to be protected against corrosion.

Surface Preparation

Before applying the surface must be clean. If possible shot blasted to Swedish Standard SA 21/2. Where impregnation of oil or salt is possible the part is either left for 10-20 hours or heated to 30-40°C (86-104°F) in order to sweat out oil or salt. Then shot blasting is repeated. In some applications shot blasting is not possible and a thorough grinding must take place to clean metal.

N.B. Steel brushing is not advisable as it gives a smooth surface. After grinding Wencon Cleaner is used for degreasing.

Mixing Ratio

Mixing ratio 1:2 by volume. Mix the contents of the two tubs until an even colour is reached.. At low temperatures, the base part is very stiff. Apply heat for better mixing (up to 25°C).

Pot Life

20-40 minutes at 20 °C (68°F).

Applying

Wencon Hi-Temp is applied using either the spatula supplied with the kit or a brush with half the length of the bristles cut away.

Overcoating

Wencon Hi-Temp is applied in two operations. It is therefore supplied in two different colours. The overcoating time depends on the temperature. The second coat must be applied whilst the first coat is still tacky. The time will vary from one to three hours. If full curing has occured a light shot blasting is necessary prior to the second coat.

Curing

Curing will take place in 10 - 24 hours at 20 °C (68°F). If high chemical resistance is required, the item should cure for up to 7 days. Elevated temperatures will shorten the curing time.

Machine-ability

After curing the Wencon Hi-Temp can be machined, drilled etc. like metal.

Chemical Resistance

After curing the Wencon Hi-Temp will be resistant to oil, water, salt water, most diluted acids and a number of solvents. It is advised to test the product for suitability.

Temperatur Resistance

Corrosion and heavy load:	160°C (320°F)
Light or no load:	220°C (430°F)
As filling compound:	up to 300°C (570°F)

Specific Volume

680 ccm/kg. (43,5 cu inch/kg)

Hardness

Shore D 82.

Coverage

Approx. 1 kg/m^2 (0,2 lb/sq. ft.) in 600 micron.

Handling Precautions

Read the instructions on the pack and the Material Safety Data Sheet.

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Wencon Putty

General Description

Wencon Putty is a two component product curing at room temperature. It is supplied in small 125 grammes units containing base and hardener.

Typical applications are leaking pipes and tanks, corroded flange faces, corroded division bars in tube coolers, O-ring seats, etc. Also ideal for modeling small models or small parts of larger models. After curing it is fully machinable.

Surface Preparation

Use grinder, emery cloth, etc. to achieve a clean, dry metal surface and degrease using Wencon Cleaner.

When repairing leaking pipes, it is possible to apply Wencon Putty direct into the leak and retain with a clip. This allows the area surrounding the leak to be ground and cleaned. Wencon Cream or Rapid is then applied in conjunction with Wencon Reinforcement Tape to encapsulate the Wencon Putty and the clip.

Mixing Ratio

Tear or cut equal amounts of base and hardener off the unit and knead or roll it in the hands until even colour develops. Each unit contains both base and hardener. Apply to clean and dry surface.

Pot Life

3-6 minutes at 20°C (68°F)

Applying

After mixing, place the Wencon Putty on to the prepared surface and massage it into the surface using the fingers. Heat cold items for better flow and adhesion.

Curing

Curing time depends on the temperature and the thickness applied. If faster curing is required, heat can be added.

At 20°C (68°F)	6 min.
Inital Set:	15 min.
Machining:	30 min.
Full Mechanical:	2 hours

Machinability

After curing the Wencon Putty can be machined, drilled, etc. like metal.

Chemical Resistance

After curing, the Wencon Putty will be resistant to oil, water, saltwater, most diluted acids and a range of solvents.

Temperatur Resistance

Corrosion and heavy load:	60°C (140°F)
Light or no load:	120°C (248°F)
As filling compound:	up to 250°C (482°F)

Specific Volume

500 ccm/kg. (30 cu inch./kg)

Hardness

Shore D 85.

Handling Precautions

Read the instructions on the pack and the Material Safety Data Sheet.

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Instruction for use

Wencon Pipe Tape

General Description

Wencon Pipe Tape is a fast curing pipe repair bandage especially formulated to make quick and effective repairs of cracks, leaks, fractures, and corrosion porosity in piping carrying water, oil, steam and most gases and solvents. Wencon Pipe Tape has good pressure, temperature and chemical resistance.

Surface Preparation

Prepare the surface by cleaning and abrading the area surrounding the damage.

Degreasing with Wencon Cleaner can improve adhesion.

Mixing Ratio

No mixing is required

Wencon Pipe Tape is pre impregnated with polyurethane resin and is water activated.

Applying

- Select the correct size Wencon pipe Tape
- Prepare the surface by cleaning and abrading the area surrounding the damage
- Soak the Wencon pipe Tape it in water for 10 seconds
- Wrap the Wencon Pipe Tape firmly around the pipe with 50% overlap, extending 50mm beyond the damage.
- Continue by wetting the outside of the bandage in the direction of the wrap until the bandage begins to set.

Pot Life

3-6 minutes depending on air and water temperature.

The bandage hardens in 10 minutes and is fully cured within 1 hour at 20°C (68°F)

Curing time

No post curing machining necessary

Machine-ability

Pipe pressure without Wencon Putty: 10 Bar*)

Technical Data

Pipe pressure with Wencon Putty: 50 Bar*)

Flexural strength: ASTM D709 111 N/mmsq.

Tensile strength: ASTM D638 172 N/mmsq.

Compression strength: ASTM D695 180 N/mmsq.

Adhesion at one-inch single overlap: 19 N/mmsq.

Dielectric strength: 16 KV/mm

Temperature Resistance

Continuous: 120°C (248°F)

Peak: 190°C (374°F)

Chemical Resistance

Water, salt water, oil, diluted acids and alkalis.

Handling Precautions

Read the instructions for use and the Material Safety Data Sheet

*) Laboratory tests have shown much higher values, but the mentioned values will count for repairs done in situ. Users are advised to make their own tests if in doubt.

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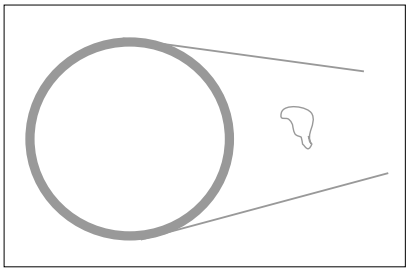
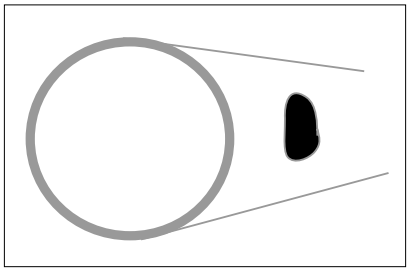
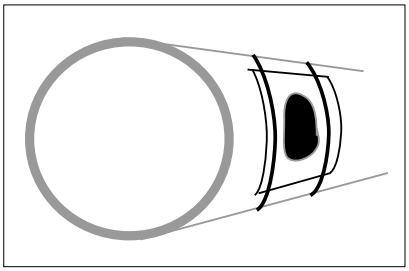
WENCON®

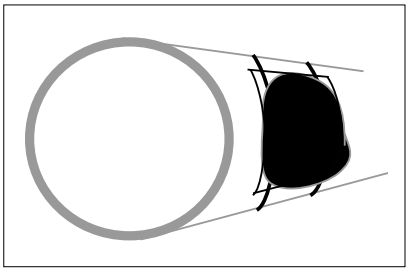
Instruction for use

Wencon Exhaust Repair Kit









Cracks or leaks in exhaust systems can only be repaired by using a product with a very high temperature resistance.

Wencon Exhaust System Repair Compound is a one component product, with a temperature resistance of 1.300°C (2400°F). That will cover by far the most systems. Follow these simple guidelines.

1. Grind and clean/degrease the affected area and the surrounding area. Use Wencon Cleaner.

2. Open one of the tubs containing the product (remember this is a one component). Stir it to an even consistency. Apply a suitable amount in and around the leak.

3. Cut a suitable piece of the metal mesh and fix it to the repair area using steel band or steel wires.

4. Apply second layer of the compound and leave it for initial curing for 3-4 hours, depending on temperature and humidity.

   When the compound has turned hard, heat it up slowly to approx. 95°C (200°F) and leave it at that temp. for 15 minutes to fully cure.

Remarks

It is important to note, that this product is designed for emergency repairs of leaks. It is not designed as for instance an internal lining for turbo charger housings.

Read the instructions on the pack and the Material Safety Data Sheet.

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Instruction for use

Wencon UW Cream for wet surfaces or under water application

General Description

Wencon UW Cream is a two-component product, to be applied under water or on a wet surface, and curing at room temperature. After curing, Wencon UW Cream will exhibit a wide range of the characteristics of metals, which together with good adhesion makes the system most suitable as a repair compound for repairing corroded and worn metal. Wencon UW Cream is non conducting and can neither corrode nor bi-metallic corrode.

Typical applications are corroded hulls and all under water parts of ships and structures, tanks, pipes, flange faces. It is also excellent for filling gaps under water.

Surface Preparation

Before applying, the surface must be clean from loose paint, scales, under water growth, etc. A mechanical cleaning will do, but even better, if possible, hydro-jetting.

Mixing Ratio

Mixing ratio 1:2 by volume. Mix well until an even color is obtained. The mixing must take place above water. After mixing, the product can be taken into the water.

Pot Life

25 - 35 min. at 20°C (68°F), depending on the amount mixed and temperature.

Applying

Wencon UW Cream is applied using the spatula supplied with the kit. Work the product well into the surface of the area to be treated, in order to obtain a close contact. As an option, you can fill the product into an empty cartridge, and inject it from this. This often helps you keep the working place more clean and thereby prevent contamination of the water.

Curing

Curing will take place in 10-18 hours, in the right temperature. Curing requires a temperature of at least 10°C (50°F), but better at 17-23°C (62-73°F) or higher. If the product shall be exposed to chemicals, let it cure for 7 days before the exposure.

Chemical Resistance

After curing, the Wencon UW Cream will be resistant to oil, water, saltwater, most diluted acids and a range of solvents.

Temperatur Resistance

Corrosion and heavy load:	60°C (140°F)
Light or no load:	100°C (212°F)
As filling compound:	up to 160°C (320°F)

Specific Volume

526 ccm/kg. (33,6 cu inch./kg)

Handling Precautions

Read the instructions on the pack and the Material Safety Data Sheet.

Remarks

If thick layers shall be applied, the consistency may allow you only to apply part of the required thickness in one application (especially if the temperature is high). The overcoating time will depend on temperature and thickness, but as soon as you can apply next layer without disturbing the previous one, that is while the previous layer is still tacky, the next layer shall be applied.

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WENCON®

Instruction for use

Wencon UW Coating for wet surfaces or under water application

General Description

Wencon UW Coating is a two-component product, to be applied under water or on a wet surface, and curing at room temperature. After curing, Wencon UW Coating will provide a smooth non-porous coating, which is resistant to bi-metallic corrosion, light chemical attack, corrosion and impingement. Wencon UW Coating contains no solvents.

Typical applications are coating of surfaces rebuilt with Wencon UW Cream and coating of steel surfaces under water like hulls and/or other submerged structures, tanks, pipes. The UW Coating is ideal for repair of ballast- and cooling pipes, in connecton with Wencon reinforcement tape. Excellent for repair jobs which, due to high humidity, have to be done in wet conditions.

Surface Preparation

Before applying, the surface must be clean from loose paint, scales, under water growth, etc. A mechanical cleaning will do, but even better, if possible, hydro-jetting.

Mixing Ratio

Mixing ratio 1:2 by volume. Mix well until an even color is obtained. The mixing must take place above water. After mixing, the product can be taken into the water.

Pot Life

25-35 minutes at 20°C (68°F), depending on amount.

Applying

Wencon UW Coating is applied using either a brush or a roller. If temperature is low, use brushes with short bristles, if temperature is high, use long bristles. The best roller type will also depend on temperature. Normally the thick, lamb´s skin type is good. The initial wetting of the brush and/or roller shall take place above water. Hereafter you can bring both the mixed product and the brush/roller into the water. Apply in a thickness of totally 300-350µ. Depending on temperature this thickness can be achieved in 2-3 layers.

Overcoating

Wencon UW Coating is applied in 2-3 operations. The overcoating time depends on the temperature. The second coat must be applied whilst the first coat is still tacky. The time will vary from two to six hours.

Curing

Curing will take place in 10-18 hours, but only if temperature allows it to cure. Curing requires a temperature of at least 10°C (50°F), but better at 17-23°C (62-73°F) or higher. If the coating shall be exposed to chemicals, let it cure for 7 days before the exposure.

Chemical Resistance

After curing, the Wencon UW Coating will be resistant to oil, water, saltwater, most diluted acids and a range of solvents.

Temperatur Resistance

Corrosion and heavy load: 60°C (140°F)

Light or no load: 100°C (212°F)

As filling compound: up to 160°C (320°F)

Specific Volume

535 ccm/kg. (34,2cu inch./kg)

Coverage:

approx. 2 msq. per kg per coat.

Handling Precautions

Read the instructions on the pack and the Material Safety Data Sheet.

Remarks

If thick layers shall be applied, the consistency may allow you only to apply part of the required thickness in one application (especially if the temperature is high). The overcoating time will depend on temperature and thickness, but

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Instruction for use

Wencon UW Putty for wet surfaces or under water application

General Description

Wencon UW Putty is a two-component product, to be applied under water or on a wet surface. After curing, Wencon UW Putty will exhibit a wide range of the characteristics of metals, which together with good adhesion makes the system most suitable as a repair compound for repairing corroded and worn metal. Wencon UW Putty is non conducting and can neither corrode nor bi-metallic corrode.

Typical applications are filling corroded hulls and all under water parts of vessels and structures. Used to stop leaking tanks and pipes etc. UW Putty is excellent to filling gaps and holes under water or on wet surfaces.

Surface Preparation

Before applying, the surface must be clean from loose paint, scales, under water growth, etc. A mechanical cleaning will do, but even better, if possible, hydro-jetting.

Mixing Ratio

Mixing ratio 1:1 by volume. Mix well until even color is obtained. The mixing must take place above water. After mixing, the product can be taken into the water.

Pot Life

Approximately 60 min. at 20°C (68°F), depending on amount mixed and the temperature.

Applying

Wencon UW Putty is applied using your hands or a spatula supplied with the kit. Work the product well into the surface of the area to be treated, in order to obtain a close contact. As an option, you can fill the product into an empty cartridge, and inject it from this. This often helps you keep the working place more clean and thereby prevent contamination of the water.

Curing

Curing will take place in 12-18 hours, but only if temperature allows it to cure. Curing requires a temperature of at least 10°C (50°F), but better at 17-23°C (62-73°F) or higher. If the product shall be exposed to chemicals, let it cure for 7 days before the exposure.

Chemical Resistance

After curing, the Wencon UW Putty will be resistant to oil, water, saltwater, most diluted acids and a range of solvents.

Temperatur Resistance

Corrosion and heavy load:	60°C (140°F)
Light or no load:	100°C (212°F)
As filling compound:	up to 160°C (320°F)

Specific Volume

629 ccm/kg. (40,2 cu inch./kg)

Handling Precautions

Read the instructions on the pack and the Material Safety Data Sheet.

Remarks

If thick layers shall be applied, the consistency may allow you only to apply part of the required thickness in one application (especially if the temperature is high). The overcoating time will depend on temperature and thickness, but as soon as you can apply next layer without disturbing the previous one, that is while the previous layer is still tacky, the next layer shall be applied.

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Wencon Ceramic Cream

General Description

Wencon Ceramic Cream is a two-component product, curing at room temperature. After curing, Wencon Ceramic Cream will exhibit a wide range of the characteristics of metals, which together with outstanding adhesion makes the system most suitable as a repair compound for repairing corroded and worn metal. Wencon Ceramic Cream is non conducting and can neither corrode nor bi-metallic corrode.

Wencon Ceramic Cream has a high abrasion resistance, making it suitable for applications on propeller nozzles, rudders, thruster tunnels and housings. In addition, the product also offer high temperature resistance, which makes it ideal for applications on gas scrubbers, condensers and end-covers.

Surface Preparation

Before applying, the surface must be clean. If possible shot blasted to Swedish Standard SA 2 1/2. Where impregnation of oil or salt is possible, the item is either left for 10-20 hours or heated to 30-40°C (86-104°F) in order to sweat out the oil or salt. Then the shot blasting is repeated. In some applications sandblasting is not possible and thorough grinding must take place to clean metal.

N.B. Steel brushing is not advisable as it gives a smooth surface. After grinding Wencon Cleaner is used for degreasing.

Mixing Ratio

Mixing ratio 1:2 by volume. Mix until even color is obtained.

Pot Life

30-40 minutes at 20°C (68°F), depending on amount.

Applying

Wencon Ceramic Cream is applied using the spatula supplied with the kit.

Curing

Curing time depends on the temperature and the thickness applied. At 20°C (68°F) 10 -15 hours. If faster curing is required, heat can be added. At 100°C (212°F) curing time is reduced to 15-20 minutes.

Chemical Resistance

After curing, the Wencon Ceramic Cream will be resistant to oil, water, saltwater, most diluted acids and a range of solvents.

Temperatur Resistance

Corrosion and heavy load:	200°C (392°F)
Light or no load:	250°C (482°F)
As filling compound	up to 300°C (572°F)

Specific Volume

538 ccm/kg (34,4 cu inch/kg)

Hardness

Shore D 80.

Handling Precautions

Read the instructions on the pack and the Material Safety Data Sheet.

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Wencon Ceramic Coating

General Description

Wencon Ceramic Coating is a two-component product, curing at room temperature. After curing, Wencon Ceramic Coating will provide a smooth non-porous coating, which is resistant to bi-metallic corrosion, light chemical attack, corrosion and impingement. Wencon Ceramic Coating contains no solvents.

Typical applications are coating of surfaces rebuild after deterioration and protection against wear, corrosion and bi-metallic corrosions. Wencon Ceramic Coating has a high abrasion resistance, making it suitable for applications on propeller nozzles, rudders, thruster tunnels and housings. In addition, the product also offer high temperature resistance, which makes it ideal for applications on gas scrubbers, condensers and end-covers.

Surface Preparation

Before applying, the surface must be clean. If possible shot blasted to Swedish Standard SA 2 1/2. Where impregnation of oil or salt is possible, the item is either left for 10-20 hours or heated to 30-40°C (86-104°F) in order to sweat out the oil or salt. Then the sandblasting is repeated. In some applications sandblasting is not possible and thorough grinding must take place to clean metal. N.B. Steelbrushing is not advisable as it gives a smooth surface. After grinding, Wencon Cleaner is used for degreasing.

Mixing Ratio

Mixing ratio 1:2 by volume. Mix until even color is obtained.

Pot Life

20-30 minutes at 20°C (68°F), depending on amount.

Applying

Wencon Ceramic Coating is applied using the spatula supplied with the kit or a brush with half the length of the bristles cut away.

Overcoating

Wencon Ceramic Coating is applied in two operations. It is therefore supplied in two different colours, brown and green. The overcoating time depends on the temperature. The second coat must be applied whilst the first coat is still tacky. The time will vary from one to two hours. If full curing has occured a light shot blasting is necessary prior to the second coat.

Curing

Curing will take place in 10-15 hours. If the coating shall be exposed to chemicals, let it cure for 7 days before the exposure.

Chemical Resistance

After curing, the Wencon Ceramic Coating will be resistant to oil, water, saltwater, most diluted acids and a range of solvents.

Temperatur Resistance

Corrosion and heavy load:	220°C (428°F)
Light or no load:	260°C (500°F)
As filling compound:	up to 320°C (608°F)

Specific Volume

658 ccm/kg. (42 cu inch/kg)

Coverage

1 kg/m^2 (0,2 lb/sq. ft.) in 600 micron.

Hardness

Shore D 81.

Handling Precautions

Read the instructions on the pack and the Material Safety Data Sheet.

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Wencon Accessories

Wencon Cleaner

General Description

Wencon Cleaner is a tetrachloroethylene based degreasing agent, which is used for cleaning purposes prior to application for the Wencon products.

Wencon Cleaner is non-flammable.

Use only the Wencon Cleaner in large or well ventilated rooms.

Wencon Cleaner is supplied in half litre units.

Wencon Release Agent

General Description

Wencon Release Agent is used in applications where you want to prevent adhesion between Wencon and the substrate.

The release agent is applied in a thin layer and left for drying in ten minutes. Remove excess material using a cloth.

Examples:

When repairing an oversized roller bearing house by casting the Wencon Cream or Rapid around the bearing, the Wencon Release Agent is applied to the roller bearing itself.

When repairing a corroded flange face, it can be done by applying Wencon Cream or Rapid to one flange and Wencon Release Agent to the other. Before curing of the Wencon the two flanges are assembled. The use of release agent assures possibility for disassembly.

Wencon Release Agent is supplied in 30 g units.

Wencon Reinforcement Tape

General Description

Wencon Reinforcement Tape is a fiber tape used for reinforcing the Wencon repair. I.e. pipe repairs and repairs of cracks or holes in engine blocks, oil sumps, etc.

After having mixed i.e. the Wencon Cream, cut off a length of reinforcement tape.

Place it on the mixing board and apply a 2-5 millimetre thick layer of Wencon Cream on top of it using the mixing knife.

Then wrap the impregnated Wencon Reinforcement Tape around the pipe having the Wencon Cream on the inner side.

The length of the tape should enable it to go 3-4 times around the pipe.

Wencon Reinforcement Tape is supplied in 10 m units.

Wencon Aggregate

General Description

Wencon Aggregate are silica carbide based granulates, which are used for both the Wencon Non-Slip surfacing and the Wencon Wear Resistant Coating (see special instructions for use).

Wencon Aggregate is supplied in two different types, No 16 is a coarse type, No 24 is the fine type.

Wencon Aggregate is supplied in sets containing 1,5 kg.

Wencon Accessories

Wencon Mixed Filler

General Description

Wencon Mixed Filler is a custommade filler to be mixed with epoxy products. For jobs, where there is a demand for an extra wear protection and if you need to improve durability,

For ektra abrasion resistance, mix Wencon Mixed Filler with Wencon Cream, Wencon Rapid or Wencon Coating.

Mix up to 1 tin (500ml) Wencon Mixed Filler with 1 kg Wencon Cream, Rapid or Coating.

Before applying the mixture, apply a thin layer of Wencon Cream, Wencon Rapid or Wencon Coating on the surface (without Wencon Mixed filler). This will increase the adhesion.

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Index - Chapter 3

Wencon Physical properties - S.I. metric system

	Wencon Cream	Wencon Rapid	Wencon Coating	Wencon Hi-Temp	Wencon Putty	Wencon Pipe Tape	Wencon Exhaust Repair kit	Wencon UW Cream	Wencon UW Coating	Wencon UW Putty	Wencon Ceramic Cream	Wencon Ceramic Coating
Max temperature	+60 - +250°C	+60 - +250°C	+60- +250°C	+160- +300°C	+60- +250°C	+120°C	Up to 1300°C (2400°CF)	+60- +160°C	+60- +160°C	+60- +160°C	+200- +300°C	+220- +320°C
Consistency	paste	paste	fluid	fluid	putty		fluid	paste	fluid	putty	paste	fluid
Mixing ratio vol.	1:1	1:1	1:2	1:2	-		No mixing. Just stir the contens before use.	1:2	1:2	1:1	1:2	1:2
Apply with	Spatula	spatula	spatula/brush	spatula/brush	hand/spatula	Hand	See prod. sheet	Spatula	spatula/brush	Hand/spatula	Spatula	spatula/brush
Potlife at 20°C	30-60 min. mixed in small amounts	10-20 min. mixed in small amounts	20-30 min. mixed in small amounts	20-40 min. mixed in small amounts	3-6 min. mixed in small amounts	4-6 min.		25-35 min. mixed in small amounts	25-35 min. mixed in small amounts	50-60 min. mixed in small amounts	30-40 min. mixed in small amounts	20-30 min. mixed in small amounts
Curing time	10-15 hours	40-90 min	10-15 hours	10-24 hours	10-20 min.	10-30 min.	Initial curing 3-4 hours	10-18 hours	10-18 hours	12-18 hours	10-15 hours	10-15 hours
Machineability	yes	yes	yes	yes	yes	No post curing machining necessary.	yes	yes	yes	yes	no	no
Hardness shore D	75	81	80	82	85			79	79	66	80	81
Tensile strength Rcrack	14,30 N/mm2	9,20 N/mm2	12,90 N/mm2	13,80 N/mm2	4,60 N/mm2	172,00 N/mm2		35,80 N/mm2	37,50 N/mm2	11,50 N/mm2	25,80 N/mm2	25,40 N/mm2
Compressive strength Rcrack	58 N/mm2	112 N/mm2	95 N/mm2	96 N/mm2	35,14 N/mm2	180 N/mm2		134 N/mm2	133 N/mm2	89 N/mm2	65,10 N/mm2	124 N/mm2
Compressive strength modulus of elasticity	1.689 N/mm2	2.891 N/mm2	2.199 N/mm2	4.284 N/mm2	NA			2.631 N/mm2	3.117 N/mm2	563 N/mm2	2.799 N/mm2	3.030 N/mm2
Adhesion steel	14,40 N/mm2	20 N/mm2	16,20 N/mm2	22,40 N/mm2	4,50 N/mm2	19 N/mm2		33 N/mm2	31,90 N/mm2	15,90 N/mm2	30,80 N/mm2	28,90 N/mm2
Specific volume	775 cm3 / kg	709 cm3 / kg	730 cm3 / kg	680 cm3 / kg	500 cm3 / kg		330 cm3 / kg	526 cm3 / kg	535 cm3 / kg	629 cm3 / kg	538 cm3 / kg	658 cm3 / kg
Heat Resistance												
Corrosion	60°C (140°F)	60°C (140°F)	60°C (140°F)	160°C (320°F)	60°C (140°F)	120°C (248°F) peak 190°C (374°F)		60°C (140°F)	60°C (140°F)	60°C (140°F)	200°C (392°F)	220°C (428°F)
Light or no load	120°C (248°F)	120°C (248°F)	120°C (248°F)	220°C (430°F)	120°C (248°F)			100°C (212°F)	100°C (212°F)	100°C (212°F)	250°C (482°F)	260°C (500°F)
For filling only	250°C (482°F)	250°C (482°F)	250°C (482°F)	300°C (570°F)	250°C (482°F)			160°C (320°F)	160°C (320°F)	160°C (320°F)	300°C (572°F)	320°C (608°F)
Dielectric strength	10 KV/mm	10 KV/mm	10 KV/mm	10 KV/mm	NA	NA		10 KV/mm	10 KV/mm	10 KV/mm	10 KV/mm	10 KV/mm

Hardness	Shore D, DIN 53505
Tensile strength	N/mm2 (10 kg/cm2) DIN 53454
Compressive strength	N/mm2 DIN 53454
Adhesion	N/mm2 (10 kg/cm2) 4 cm sq.double overlap ISO 4624
Specific volume	cm3 per kilogramme

Formulars geometri

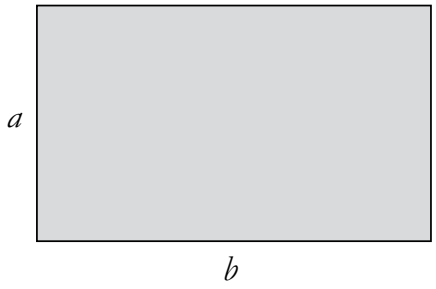
Rectangle

Area:

$A = a \times b$

Round:

$R = 2 \times a + 2 \times b$



Triangle

Round:

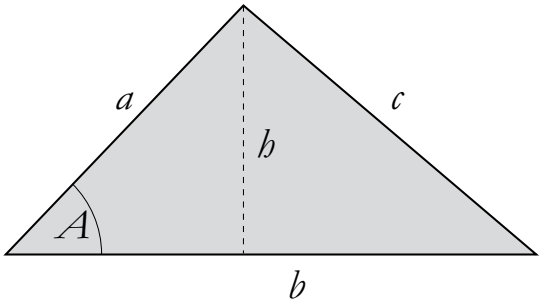
$R = a + b + c$

Area = ½ x h x b

Area = ½ a x b x sin A

Area = $\sqrt{s\,(s-a)\,(s-b)\,(s-c)}$

s = ½ (a + b + c)



Circle

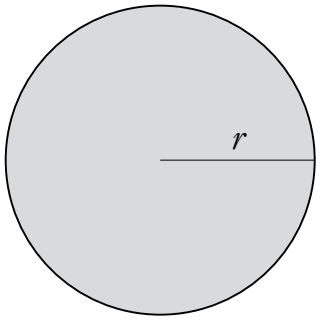
Area:

$A = \pi \times r^2$

Round:

$R = 2 \times \pi \times r$

$\pi = 3{,}14$



Regular box

Lenght a

Height b

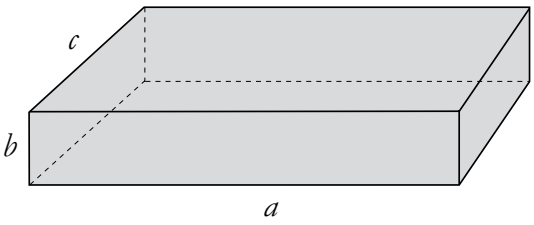
Wide c

Volume:

$V = a \times b \times c$

Surface:

$S = 2 \times (a \times b + a \times c + b \times c)$



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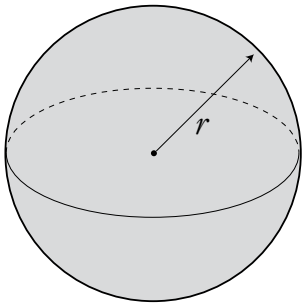
Formulars geometri

Ball with radius r



Volume:

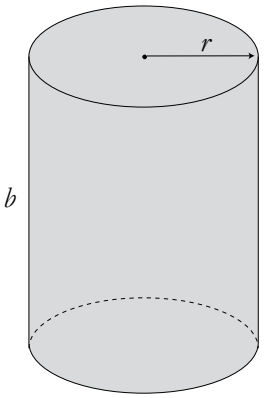
$V = 4/3 \times \pi \times r^3$

Surface:

$S = 4 \times \pi \times r^2$

$\pi = 3{,}14$

Rectangular cylinder



with radius r & height h

$\pi = 3{,}14$

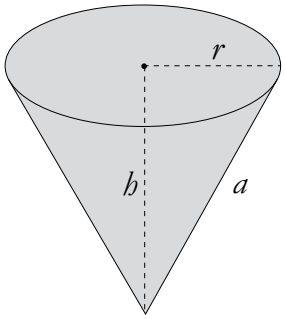
Volume:

$V = \pi \times r^2 \times h$

Bending surface:

$S = 2 \times \pi \times r \times h$

Cone



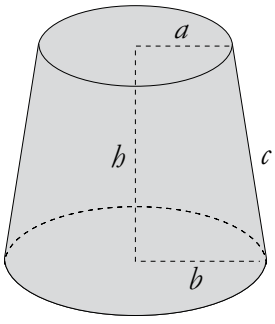
Volume:

$V = \frac{1}{3} \times \pi \times r^2 \times h$

Bending surface:

$S = \pi \times r \times \sqrt{r^2 + h^2} = \pi \times r \times a$

Truncated cone



Volume:

$V = \frac{1}{3} \times \pi \times h \times (a^2 + a \times b + b^2)$

Bending surface:

$S = \pi \times (a+b) \times \sqrt{h^2 + (b-a)^2} = \pi \times (a + b) \times c$

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How to calculate

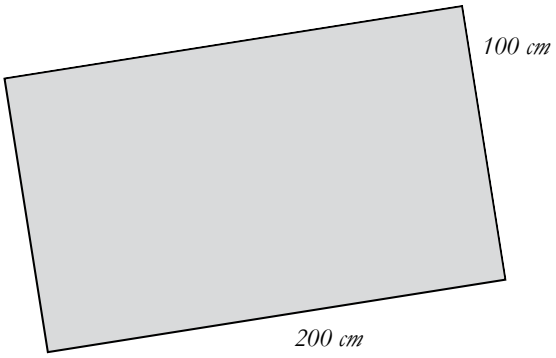
Coating a surface

You can coate either a flat surface, or a bended surface (pipe, round tank etc.).

You have to decide what layer thickness you want. For a coating, Wencon recommend 600-800 microns (0.6 - 0.8 mm).

To calculate the consumption of Wencon Coating, you can use the examples shown below.

Example 1: Coating a flat surface



Layer thickness (t)= 800 microns (0,08 cm)

Volume of coating = 200 cm x 100 cm x 0,08 cm = 1600 cm^3

Specific volume of Wencon Coating Blue or White

1 kg = 745 cm^3

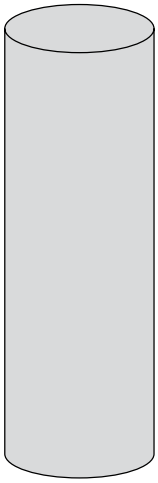
$$\frac{1600\ cm^3}{745\ cm^3} = 2{,}15\ kg$$

2.15 kg is the theoretical value. In practice you have waist (mixing, potlife, variation in layer thickness etc.) In practice you have to multiply with a waistfactor varying from 1.2 to 2 according to your own experience.

In our documentation we calculate with a waste of 25 % This means that when the theoretical coveredge in 600 micron is 0,8 kg/m^2, the practical coverage will be 0,8/kg/m^2 + 25% = 1 kg/ m^2.

How to calculate

Example 2: Coating a tank



Layer thickness (t) 800 microns (0,08 cm)

Cylinder part:

$2 \times \pi \times r \times h \times t = 2 \times 3{,}14 \times 50 \times 300 \times 0{,}08 = 7536 cm^3$

Top and bottom plates:

$\pi \times r^2 \times 2 \times t = 3{,}14 \times 50^2 \times 2 \times 0{,}08 = 1256\ cm^3$

Total coating volume is $7536\ cm^3 + 1256\ cm^3 = 8792\ cm^3$

Specific volume for Wencon Coating 1 kg = $745\ cm^2$

$$\text{consumption} = \frac{8792\ cm^3}{745\ cm^3} = 11{,}8\ kg\ (\text{theoretical})$$

In practice 11,8 kg x 1,25 (or other weightfactor - see x 1) = 14,75 kg

Example 3: Coating a pipe outside - **examples calculated per m pipe.**

Below is a table showing the theoretical consumption of Wencon Reinforcement Tape and Wencon blue / white coating at different pipe diameters, applying 3 rounds or 5 rounds of Reinforcement Tape. All values calculated per m pipe.

The same table can be used for Wencon HiTemp Coating and Wencon UW Coating by adding 8 % to the consumption of blue/white coating.

Important: The shown values are theoretical, and you have to multiply with a waste factor (1,2 - 2 according to your own experience) to reach the practical consumption.

Pipe diameter	3 Rounds	5 Rounds
1 mtr x 20 mm	0,13 kg - 8 m	0,22 kg - 13 m
1 mtr x 30 mm	0,20 kg - 12 m	0,32 kg - 19 m
1 mtr x 50 mm	0,32 kg - 19 m	0,53 kg - 32 m
1 mtr x 60 mm	0,38 kg - 23 m	0,64 kg - 38 m
1 mtr x 70 mm	0,45 kg - 27 m	0,74 kg - 44 m
1 mtr x 80 mm	0,51 kg - 31 m	0,85 kg - 51 m
1 mtr x 90 mm	0,57 kg - 34 m	0,95 kg - 57 m
1 mtr x 100 mm	0,64 kg - 38 m	1,10 kg - 63 m
1 mtr x 120 mm	0,76 kg - 46 m	1,30 kg - 76 m
1 mtr x 160 mm	1,02 kg - 61 m	1,70 kg - 101 m
1 mtr x 200 mm	1,30 kg - 76 m	2,10 kg - 126 m
1 mtr x 250 mm	1,60 kg - 95 m	2,70 kg - 157 m
1 mtr x 300 mm	2,00 kg - 113 m	3,20 kg - 189 m

Wencon test methodes

All Wencon Epoxy products ares tested according to below mentioned methodes.

Only the test, important for calculation of which product to choose for which application, are mentioned below:

1. All tests are with the exception of the determination of the heat resistance, executed at room temperature 20°C (68°F).
2. The potlife and "highest temperature during reaction" are determined with 100 grams mixed material. The rise of temperature is measured with the aid of a digital thermometer.
3. For the determination of the heat resistance, the products are coated on steel plates and stored during seven days at room temperature. After those seven days they are stored at elevated temperature and reviewed every 24 hours.
4. Compressive strength:
   - curing time: 14 days
   - dimensions of the cubes: 13 x 13 x 13 mm
   - used testing machine: Wolpert, type TT 1220 25 kN
   - testing speed: 5 mm / min

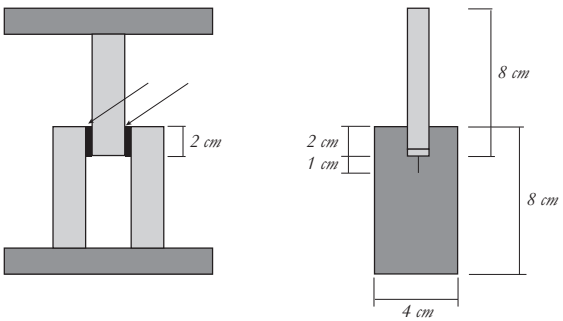
   Modulus of elasticity: A calculated factor showing the relationship between the press on the material and the defomation.

   R_{crack}: The point where the material breaks apart
5. Tensile strength:
   - Curing time: 14 days
   - used testing machine: Wolpert, type TT 1220 25 kN
   - Testing speed: 15 mm / min

   Modulus of elasticity: A calculated factor showing the relationship between the press on the material and the defomation.

   R_{crack}: The point where the material breaks apart
6. Shear adhesion to steel:

The shear adhesion is determined according to the subjoined drawings:



The test bars are sandblasted to optimise the adhesion of the applicated Wencon product. After the surfaces were glued tohether with the several Wencon products, they are cured seven days at room temperature. The shear adhesion is determined using the following testing machine: Wolpert, type TT 1220 25 kN.

The shear adhesion is calculated according the following formula:

$X = P / A$

X: shear adhesion (N/mm^2)

P: pressure at break (N)

A: total of the glued area (mm^2)

Test of resistance to liquid pressure

Test of resistance to liquid pressure for Wencon

Product: WENCON RAPID

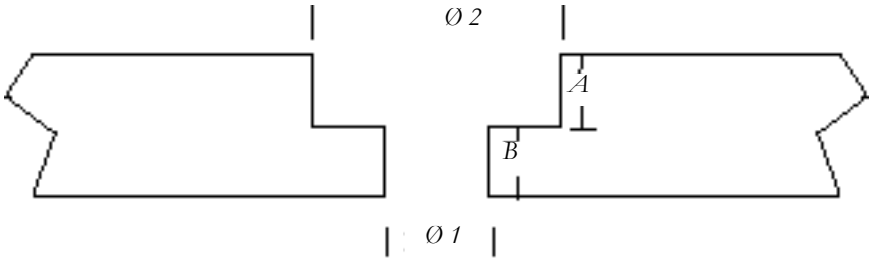
Test issued by: Flådestation Frederikshavn (The Danish Navy) being accredited test facility for pressure tests.

Objective: To establish a description for the product´s ability for use in repairing holes and leaks in pressure vessels, pipes, etc.

Description: Two specimens were made, having holes as shown in ill.

1. Ø 1 = 11,2 mm, Ø 2 = 50,0 mm, A = 5 mm, B = 7 mm, reinforcement.: None.
2. Ø 1 = 16,0 mm, Ø 2= 50,0 mm, A = 10,0 mm, B = 9 mm , reinforcement : 2 layers of fiber tape

The water pressure was given from the side, where Ø 2 is situated.



The test pieces were made and were left for curing in 48 hours. Hereafter they were subjected to water pressure.

1. Test piece No. 1 was mounted in the test stand, sealed with klingerit seal for 25 bar. The pressure was raised to 60 bar, at which pressure the seal was blown out. The test stand was renovated and O-ring seats were machined in stead. The test was repeated.

In the second test, the pressure was raised to 160 bar, at which pressure the flange was deformed to an extent, where the O-rings were blown out.

Conclusion:

At a pressure of 160 bar, there was no sign of damage to the repaired area of Testpiece 1.

2. Test piece No. 2 was mounted in the test stand, and the pressure was raised to 425 bar, at which pressure the flange was deformed to an extent, where the O-rings were blown out.

Conclusion:

At a pressure of 425 bar, there was no sign of damage to the repaired area of Testpiece 2.

16.05.95

Force-Dantest certificate

DANAK Reg. No. 8

Test Report

FORCE-Dantest CERT

File No. 133224/m1493-681
Date 2000-03-01
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Enclosure 0
KG/BR

FORCE INSTITUTE

Wencon ApS
Jyllandsvej 15
DK-5400 Bogense

FORCE Institute hereby informs you about the result of the testing of 5 pieces of steel pipe delivered to us on 16th February 2000.

The pipes had an outside diameter of approx. 50 mm and a length of approx. 260 mm and they were numbered 2, 3, 5, 6 and 8 respectively.

The pipes were closed in both ends with a welded end plate - one solid and one with a threaded hole, and each pipe had a wrapped bandage with a total width of approx. 90 mm. According to statement the bandages were placed to cover bored holes with diameter 5 mm.

To each pipe an increasing internal water pressure was applied up to 240 bar at room temperature.

All the bandages leaked water at a pressure lower than 240 bar but after releasing the pressure of 240 bar no visible defects were observed on the bandages.

The pressures where the bandages showed leakage are stated in the table below.

Pipe No.	Leakage occurred at
2	155 bar
3	160 bar
5	175 bar
6	169 bar
8	158 bar

FORCE Institute
Inspection and Testing

Kjeld Grønfeldt
B.Sc. (Mech. Eng.)

Declaration of Asbestos-Free Products

Manufacturer / Supplier

Company name:	Wencon ApS
Street:	Jyllandsvej 15
ZIP code:	5400
City:	Bogense
Country:	Denmark
Name of authorized representative:	Erik Wendelin
Position:	CEO
Phone:	+45 6481 1010

We declare in accordance with the SOLAS Regulation II-I/3-5, New Installation of Asbestos in connection with IMO MSC.1/Circ.1374 and 1379:

All materials, products and components
for supply by our company are completely free of asbestos.

On behalf of:	Wencon ApS (Company name)
Date:	August 14, 2013
Signature / company stamp:	

Chemical resistance list

Inorganic Acids	Arsenic acid	2
	Carbonic acid	2
	Hydrobromic acid (0-10%)	2
	Hydrochloric acid (0-10%)	2
	Hydrochloric acid (10-20%)	1
	Hydrochloric acid (above 20%)	0
	Nitric acid (0-10%)	2
	Nitric acid (10-20%)	1
	Nitric acid (above 20%)	0
	Nitrous acid (0-10%)	2
	Oleum	-
	Phosphoric acid (0-5%)	2
	Phosphoric acid (5-10%)	1
	Sulfuric acid (0-10%)	2
	Sulfuric acid (10-20%)	1
Organic Acids	Acetic acid (0-10%)	2
	Acetic acid (10-20%)	2
	Acetic acid (above 20%)	0
	Benzoic acid	2
	Carbolic acid	0
	Chloroacetic acid	0
	Chlorosulphonic acid (dry)	0
	Chlorosulphonic acid (wet)	0
	Creosote oil	0
	Cresylic acid	-
	Fatty acid (high mol.w)	2
	Formic acid (0-10%)	1
	Formic acid (above 10%)	0
	Lactic acid (0-10%)	1
	Linoleic acid	2
	Maleic acid	2
	Malic acid	2
	Oleic acid	2
	Phenol (100%)	-
	Phthalic acid	2
	Phthalic anhydride	2

Chemical resistance list

Alcohols	The test for alcohols show good resistance, but from experience in the industry it is advised to make a test for each application.	
Alkalis	Ammonia, anhydrous	2
	Ammonia, solution	2
	Barium hydroxide	2
	Calsium hydroxide	2
	Magnesium hydroxide	2
	Potassium hydroxide (0-20%)	2
	Potassium hydroxide (above 20%)	1
	Soap solutions (stearates)	2
	Sodium Hydroxide (0-20%)	2
	Sodium hydroxide (above 20%)	1
Oils	The system seems to be resistant to all types of oil, vegetable, animal and mineral types as well as hydrocarbons except for the halogenated ones.	
Key	Very good	2
	Good	1
	Fair	0
	Not good	-
	It is always advisable before entering large applications to test the product against the medium.	
	THIS RESISTANCE LIST IS ONLY FOR INTERNAL USE AND IS NOT MEANT AS A PART OF THE BROCHURES. LAB. TESTS DO NOT ALWAYS SHOW RELIABLE FIGURES. THE WENCON COMPANY TAKES NO RESPONSIBILITY FOR APPLICATIONS MADE.	

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Index - Chapter 4

1. Blasting

There are basically two different methods of blasting. Wet blasting and dry blasting. Shot-blasting, sand-blasting and grit-blasting employ different types of blasting material, but are essentially the same. In this manual we will use the word blasting.

For small applications we can recommend our Wencon Blaster (dry blasting). See chapter I in this Manual.

1.1. Dry Blasting

Dry blasting is the most common kind of blasting. There are a large number of companies who use dry blasting and the way we become involved is usually to specify. Blasting is not only used for cleaning metal surfaces, but also for cleaning houses before painting them. Blasting is also very much used before painting steel constructions, etc. Blasting is without doubt the best way of preparing the surface for Wencon applications. It offers the best physical adherence, and is by far the most efficient way of cleaning the part. Accordingly, whenever possible we advise our customers to use blasting prior to an application.
If blasting is impossible, other ways of surface preparation must be adopted. Machine parts that have been in use, for instance in sea water, will have quite an amount of water and salt penetration into the metal structure. This penetration should be removed before application, or, said in another way, sufficient salt and water should be removed to ensure salt and water do not come to the surface of the substrate before the Wencon repair material has cured. If the surface of a machine part shortly after blasting turns black, or perhaps very dark, it is a sign of salts sweating from the substrate. A way of accelerating the sweating out of the salts is by heating up the part or leaving it in a warm place for at least 12 hours. The most efficient way of removing water from the substrate is by using dehumidification units. (See Wet Blasting) In many instances it may be a good idea to use written specifications. This may sound rather formal, but does not need to cover more than indicated below.

Specification for Dry Blasting

1. Blast the machine part to SA 2 ½ using sharp-edged blasting media, to a roughness of min. 75 microns.

2. Leave the part for sweating out salts in a warm place for at least 12 hours or heat it up to 30 - 40 °C (86-104 °F) using gas torches.

3. Blast again to SA 2 ½ immediately prior to the application.

4. For parts containing lots of water and salt it may be necessary to repeat 2. and 3. until the surface remains light grey for at least 2 hours after blasting. Most companies will understand a specification like this, but it may be necessary to check the blasting prior to application. If there are any signs of salts sweating out, the parts must be blasted again.

1.2. Wet Blasting

Some applications do not allow dry blasting due to dust coming from the process. For instance when the application should take place on site and you have lots of motors, pumps, valves etc. in close proximity, your customer may not be too happy about dry blasting. The reason being that dust will enter roller bearings, etc. even inside the motors. Under such conditions the answer may very well be wet blasting. Wet blasting is carried out in almost the same manner as dry, but using water in union with air and grit. We use the same standards as for the dry blasting (SA 2.5, SA 3 etc.). There are two problems that will often follow dry blasting. The first being that the technique leaves the substrate wet, the other being the fact that a wet surface will oxidize before getting dry.

Dehumidification. Prior to application on a surface that has been wet blasted, a dehumidification must take place. Dehumidification units can be hired from many firms who rent out machines. Be sure to get the firm to help you to choose the correct type and size for the application. After dehumidification a light dry blasting may be necessary. It may be done using equipment that retrieves the blasting material and dust by means of vacuum suction.

2. Perago

Using a Perago disk is a little like blasting, but without sand.

Perago is a rubber disk with hard steel spikes mounted on the perifericke. Perago can be mounted in a normal drilling machine, and gives a surface close to a blasted surface - clean and rough with sharp edges. Perago dishes can be ordered at Wencon and all Wencon distributor.

3. Grinding

For small repair jobs we can often meet too many objections to blasting. Wheel grinding is an acceptable way in cases, where it is possible to grind the entire surface. Most often when repairing mechanical damages. Corroded areas are often in a state where a wheel grinder will only be able to cover part of the surface, and is therefore not advisable here. When grinding use a coarse stone. Use the Wencon Cleaner before and after grinding. Grinding with sandpaper or emery cloth is only advisable when, for example, carrying out shaft-repair on a lathe.

4.1. Needle Gunning

Needle gunning is a method that has almost been forgotten in recent years. Or should we say is mostly used for very rough cleaning or removal of rust. It is possible to do a very nice job using a needle gun, but it takes time and should be closely supervised. It is essential that the marks from the sharp needles cover the whole surface so that none of the original surface remains. It is recommendable to steam clean the surface before needle gunning. (see steam cleaning)

4.2. Turning

When carrying out mechanical repair jobs, turning is often the best and easiest way of preparing the surface. When, for instance repairing a worn shaft damaged by a loose roller bearing, turning to a rough standard should be done prior to degreasing and application.

4.3. Steam cleaning

An effective method of removing salt and oil remaining in the substrate is to use steam cleaning. Steam cleaners are available from most plant hire firms. Use steam temperature of approx. 95 °C and repeat the process three times, leaving the substrate to dry for some 15 minutes between each cleaning. Steam cleaning is not sufficient in itself. It must be followed by blasting or one of the other surface preparation methods.

5. Dehumidification

A very simple and effective method of removing moisture, whether it be moisture in the metal or from wet shot-blasting, is dehumidifying. Even parts which appear to be completely dry can contain large quantities of moisture. When coating tanks, or other totally or partly enclosed parts - large pumps, pipes, etc. - dehumidification is recommended, as humidity emanating from the persons doing the work can condense on the part and reduce its physical adherence. Dehumidification units (DU) can be hired in most towns, and plant hire firms are very helpful in advising the type and capacity of the unit.

Position the DU close to the substrate to be treated and insert the tube carrying dry air into the tank or part. If the parts to be treated are numerous and small, make a tent of plastic sheets and feed the tent. Usually a few hours of dehumidification is enough to obtain a dry and good surface ready for the application.

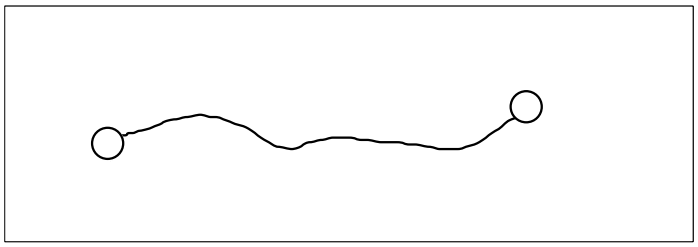
A quality requirement of dehumidification is that during the coating process there must be a temperature of minimum 3°C above the point of condensation. The point of condensation temperature is the highest the part must have, when moisture from the surroundings falls on the part and condenses. The point of condensation is thus dependent upon the temperature of the part, the ambient temperature, and the relative humidity of the air. Instruments exist for measuring these values, and where the repair of large parts is concerned, conditions should be laid down regarding this, if the application is to be done by subcontractor or customer.

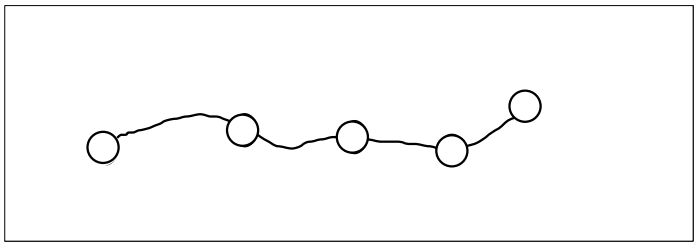
6. Steel brushing

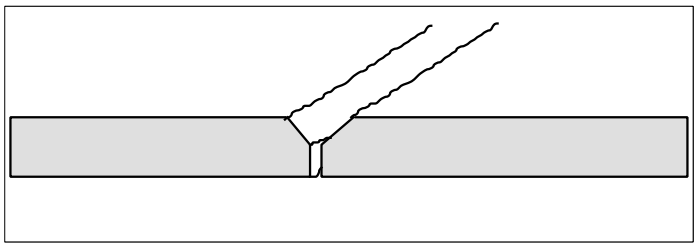
Cleaning by using a steel brush (by hand or on a machine) we can not recommend. A steel brush leaves a polished surface which will reduce the adhetion of Wencon or other products - paint etc.

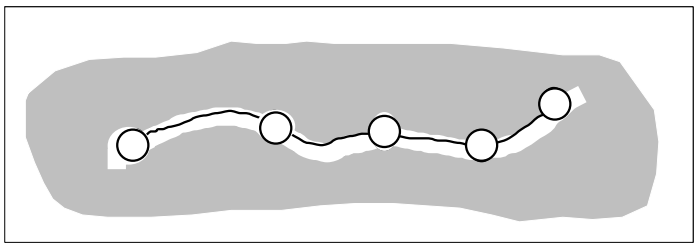
Index - Chapter 5

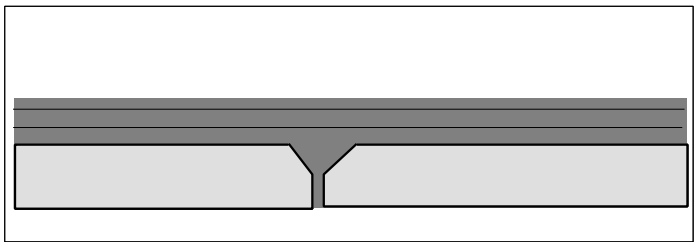
Repairing cracks in cast iron











1. Drill a hole in each end of the crack to prevent the crack elongating.

2. Drill holes (at least one) at 5 cm (2 inch) intervals, directly in the crack. Place a self-tapping screw in each hole (except for the two extreme positions) to prevent the crack from moving.

3. With an angle-grinder, grind a "V" directly in the crack. Also grind away the screw-heads.

4. Grind the surface in a wide belt round the repair area. Ensure grinding is as rough as possible. Now clean thoroughly with Wencon Cleaner.

5. Apply a thin layer (approx. 1 mm) of Wencon Cream (or Rapid). Place a piece of Wencon Reinforcement Tape in the layer, and apply 2-5 additional layers of Wencon with Wencon Reinforcement Tape between the layers. Allow curing.

It is important to recognize that this repair only aims to seal the crack, not provide physical strength.

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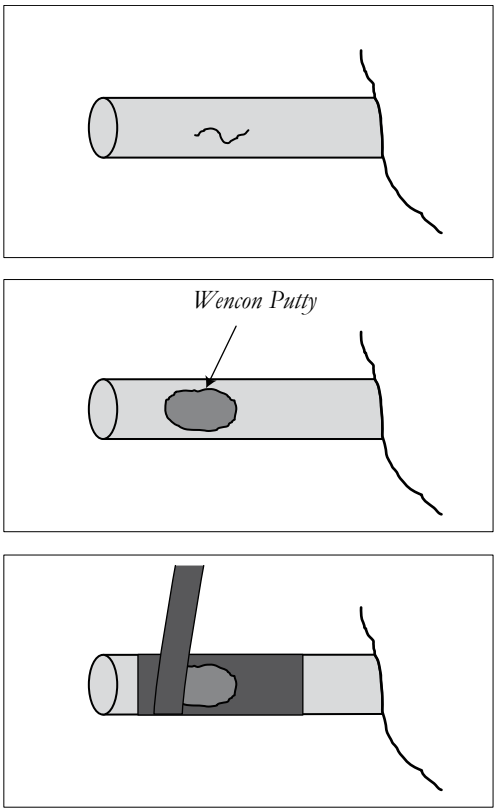
Pipe repair - sea water pipe



On all pipe repairs you have to consider - temperature and pressure during operation. This will help you to choose the right Wencon product and the right application datasheet.

In general for normal temperatures use Wencon Cream or Rapid. If you want a top coat use Wencon blue / white coating. For high temperature pipes use Wencon Hi-Temp, which can take temperature up to 160°C (320°F) in corrosive conditions and up to 300°C (570°F) used as a filler. If the surface is wet (ballast pipes) use Wencon UW Cream and Wencon UW Coating as the top coat.

Wencon UW Cream and Wencon UW Coating will have a good adhesion on a wet surface - even under water.

1. If possible drain the pipe. Clean and dry the repair area and determine the size of the leak.
2. With an angle grinder, a Perago dish or coarse emery cloth, grind a belt around the pipe over an area 10-15 cm (4-6 inch) wider than the leak. Clean the repair spot thoroughly with Wencon Cleaner.
3. If liquid is still coming out of the leak mix and apply a suitable amount of Wencon Putty directly into the crack, to stop the leak. Clean again with Wencon Cleaner.
4. Mix an adequate amount of Wencon Cream or Rapid.
5. Apply the first layer of Wencon Cream or Rapid, using a brush or a spatula. 0,3-0,5 mm (0.01-0.02 inch).
6. Wrap the Wencon Reinforcement Tape tight around the pipe with 50% overlap. Make sure the Reinforcement Tape is fully impregnated with Wencon.
7. Again apply a layer of Wencon, and repeat until you have 3 layers of Wencon.
8. For repairs that shall last for a longer period, we recommend to apply 2 layers of Wencon Coating on top of the Cream or Rapid after same method.

Curing time can be speeded up by heating up - Halogen lamps or like.

To see the theoretical consumption of Wencon material and Wencon Reinforcement Tape, see chapter 1 in the Wencon Repair Manual.

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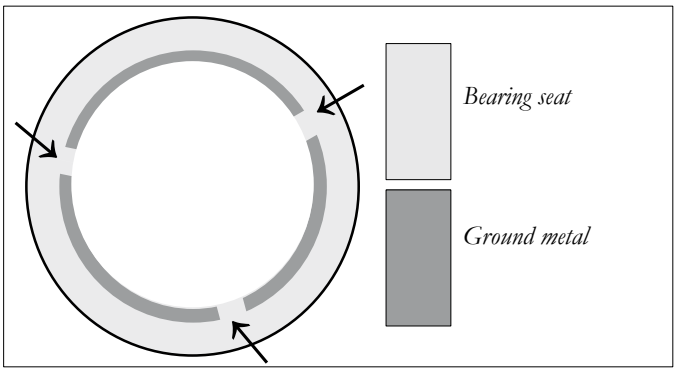
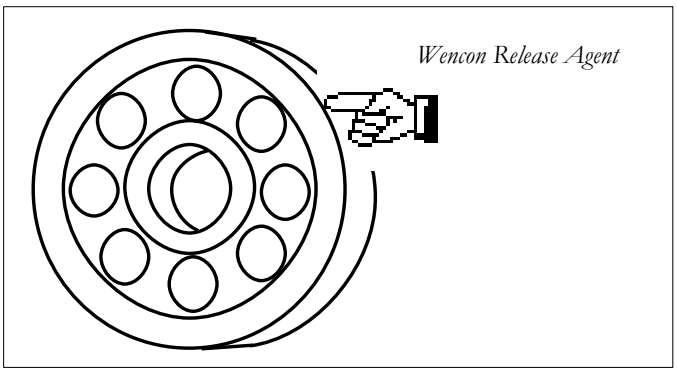
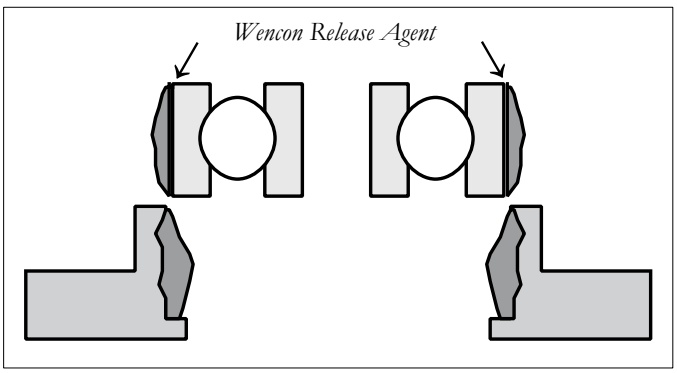
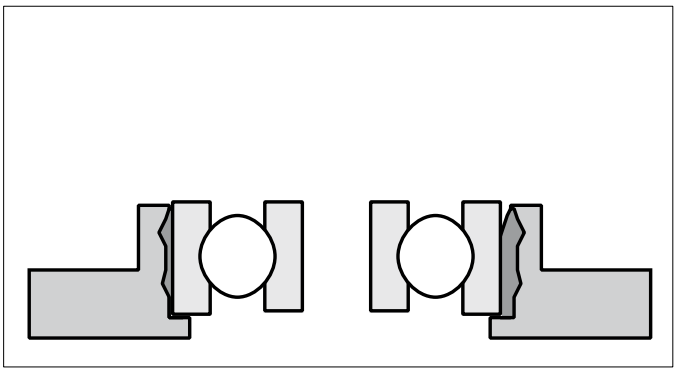
Repair of over-sized bearing seat









1. Remove the old bearing. Degrease the bearing seat with Wencon Cleaner. Mark out three locations (note the arrows) which must not be grinded. The purpose of these marks is to ensure good centering. Grind between these locations approx. 0.5-1,0 mm (0,02-0,04 inch) into the metal. Clean again thoroughly with Cleaner.

2. Apply a thin layer of Wencon Release Agent to the new bearing. Allow to dry for approx. five minutes, then wipe clean until only a film is left.

3. Mix and apply an adequate layer of Wencon Cream or Rapid to both the bearing seat and the bearing itself.

4. Position the bearing correctly in the seat and allow curing. Please refer also to directions for use.

The repaired bearing seat has a compressive strength 7-12 times higher than normally required.

Variations:

Seats for bushings are repaired in the same way.

This type of work can also be carried out in a turning lathe. All Wencon products are fully machinable after curing.

In some cases it may be an advantage to use a purpose-made mandrel to cast from.

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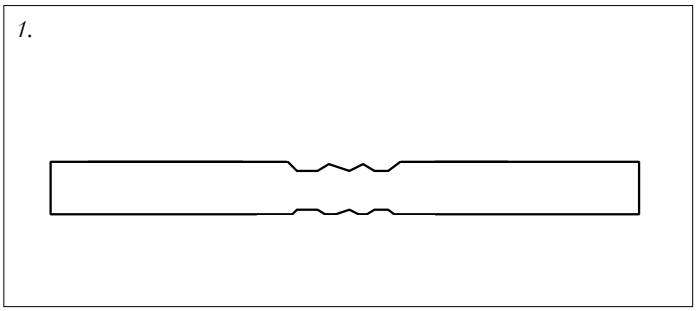
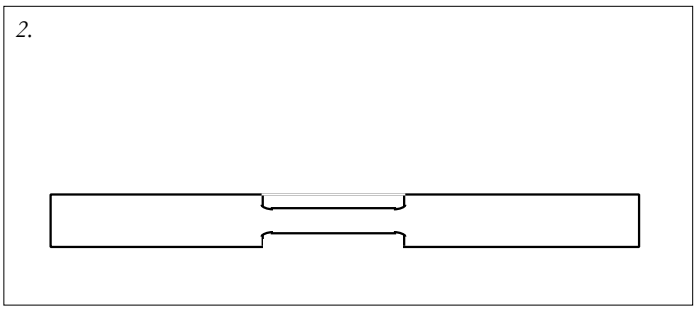
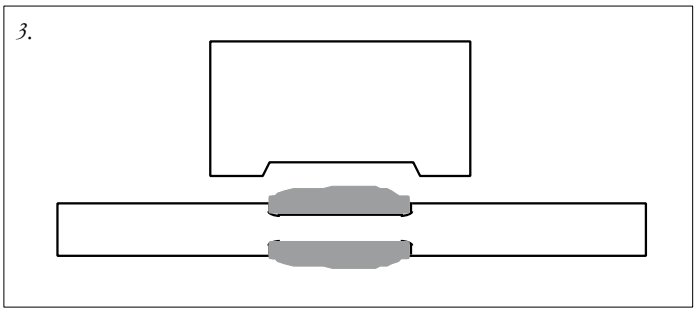
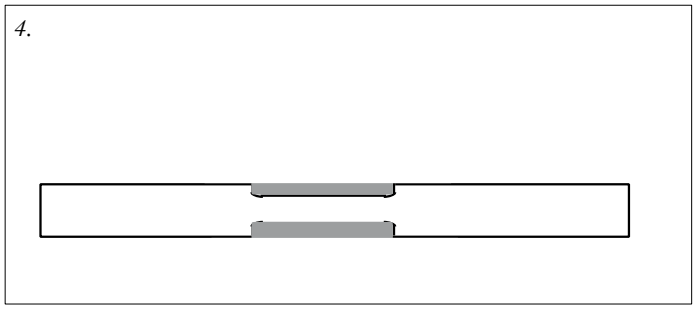
Repair of damaged shafts









In cases where damage is caused by an object which was meant to be fixed to the shaft, but has rotated, the chances of successful repair are good. Any repair presupposes that the shaft is of adequate mechanical strength.

1. Place the shaft in the turning lathe.

2. Turn the shaft as shown. Finish off with a rough turning or a thread.

3. Mix a suitable amount of Wencon Cream or Rapid and apply one layer to the shaft. If necessary, make a spatula as shown.

4. When cured, turn to final size. If so desired, an interference fit can be machined, or the bearing can be glued on.

Variations:

Rather than using the turning lathe, the first turn can be replaced by grinding with an angle-grinder. A couple of bushes must also be made with the internal diameter of the final size required. These bushes should be approx. twice the length of the damaged area, and be used for casting of the new surface on the bearing site. The bushes must be treated with Wencon Release Agent prior to casting.

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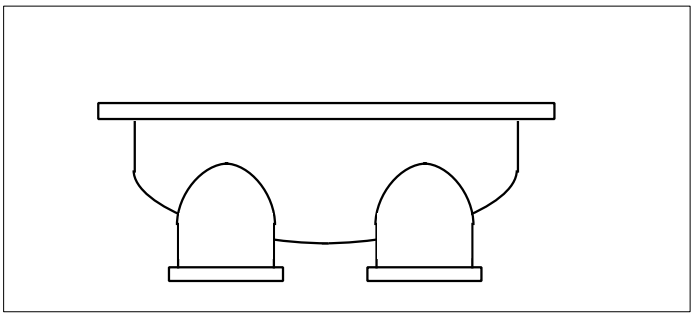
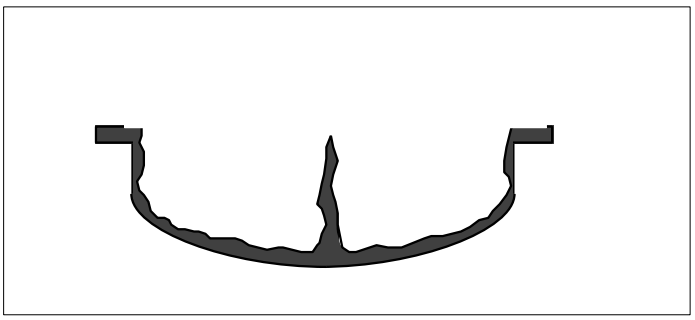
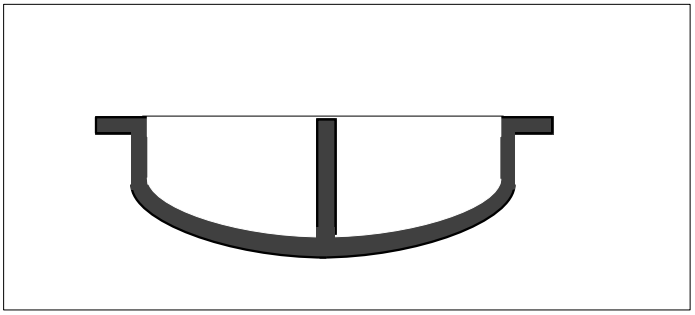
Repair of corroded cooler end cover







Corroded cooler end covers are very common problems on board a ship. There are several ways of dealing with this. A temporary repair can be made, or the repair can be of a longer lasting nature. The latter method necessitates shot blasting, which as a rule is undertaken ashore. Grinding or needle gunning are other means of carrying out the preparatory work. It is important to remove the graphite as the aim is to obtain a clean metal surface. The inlet and outlet end cover is shown here.

1. Disassemble the end cover and carry out the preparatory work. Finished by cleaning with Wencon Cleaner.

2. Build up the end cover to its original shape with Wencon Cream or Rapid. If there are holes in the metal, whether in the outer sides or in the division bar, it will be an advantage to reinforce the repair with either Wencon Reinforcement Tape or a piece of metal mesh. The metal mesh is particularly advantageous with big holes as the rigidity of the mesh makes application easier.

   Apply the Wencon well beyond the edges, and after curing grind away the surplus with a wheel grinder.

3. Build up also the edge of the division bar and prior to curing fit and tighten in place a piece of angle iron or the like, on the flanges, in such a manner that the division bar is given its required shape. The iron rail is treated with Wencon Release Agent before tightening in place.

After rebuilding and partial curing brush a layer of Wencon Coating, white over the entire end cover. Allow to cure for 1-2 hours, then finish with a coating of Wencon Coating, blue.

Alternatives.

If the end cover is corroded only on the packing surface of the division bar, the repair is done by grinding and cleaning this, applying thereafter a coat of Wencon Rapid, followed by a coat of release agent on the tube end plate. Mount the end cover before curing takes place. The packing surface will then be shaped automatically.

Re. curing times. Please refer to the appropriate directives.

NOTE ! Be careful with the coating. If there are holes in the coating, these will give risen to bi-metallic corrosion.

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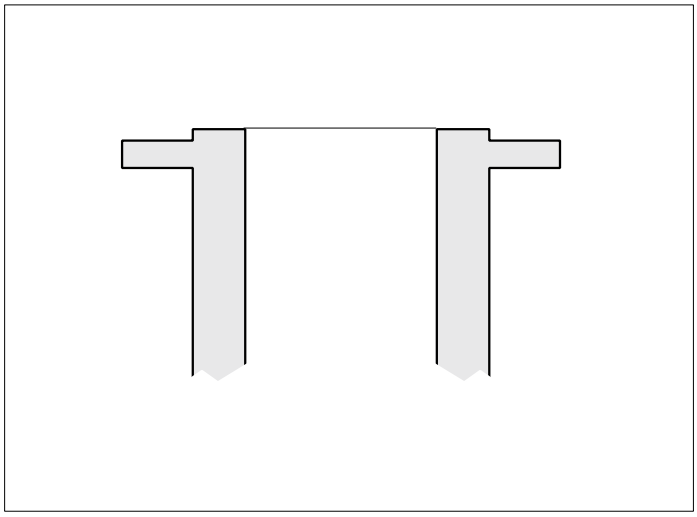
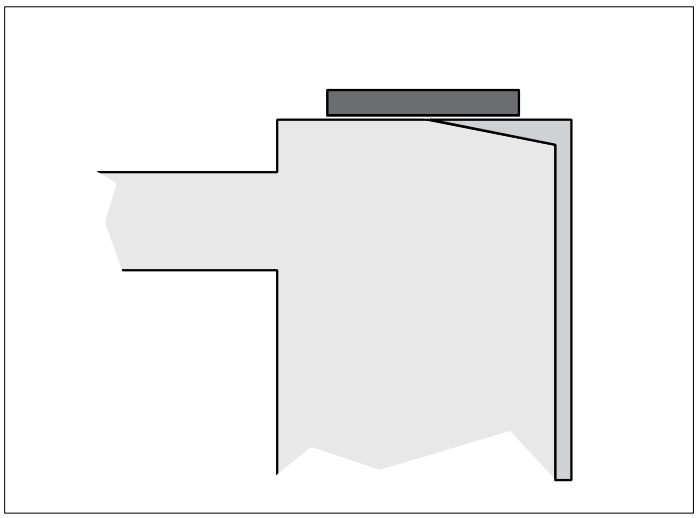
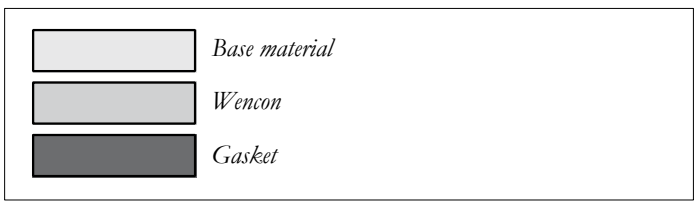
Coating of pipe ends and flanges







To extend their lifetime it is often a good idea to coat the pipe ends internally. It is very important to do this carefully, as the applied coating would otherwise do more harm than good.

1. Determine how far into the pipe the coating has to be applied. Clean the pipe by shot blasting, grinding or the like.

2. Before applying the Wencon Coating the innermost edge of the packing surface must be ground as shown in the diagram. It is important that the seal and the coating overlap, so as to avoid the untreated portion of the packing surface becoming wet. Apply the coating as shown in the diagram. Please refer also to the directions for use of Wencon Coating.

After curing, grind or turn to obtain a smooth packing surface.

This operation can be obviated if, before curing, a mandrel is fitted tightly on to the flange. This mandrel must be given a coat of Wencon Release Agent or be made of plastic.

When assembling the pipe it is of great importance that the gasket does not press on the innermost edge of the flange (see diagram).

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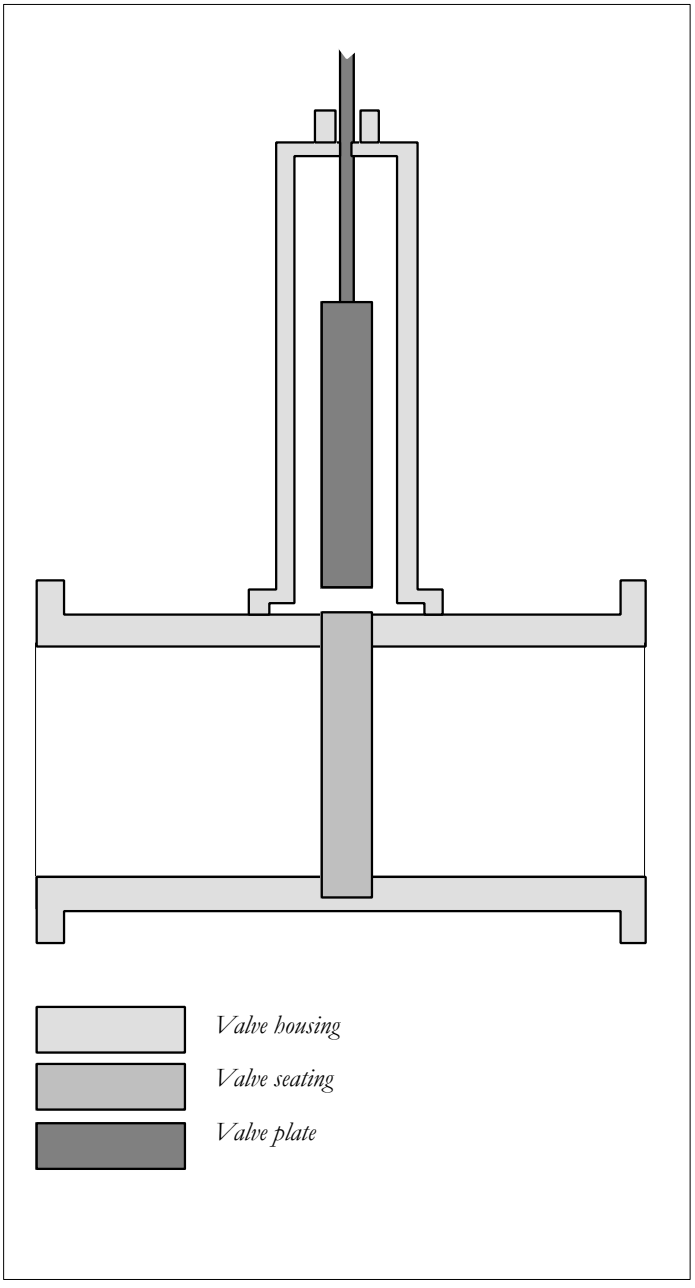
Repair of corroded valve seatings



Leakages in valves are often due to corrosion in the seatings. As a rule the valve is a construction of a number of different metals. Therefore there is every possibility of light acidic agents, such as sea water, causing bimetallic corrosion.

This application deals only with emergency repair of corroded seatings. Complete renovation of valves is dealt with in another application sheet. Whether the valves in question are plate valves or butterfly and non-return valves, the method of application is much the same.

Clean the corroded seating with Wencon Cleaner and work down to clear metal by grinding, shot blasting or needle gunning (sharp needles). Clean once again.

Apply a coat of Wencon Release Agent to the valve plate. This will prevent adhesion. Mix and apply an adequate amount of Wencon Cream or Rapid to the valve seating and close the valve immediately afterwards.

When curing is completed open the valve and grind the seating edges to shape. Wencon adheres to all metals. Wencon retains its form and size during curing.

Please refer also to the application instructions accompanying the Wencon product.

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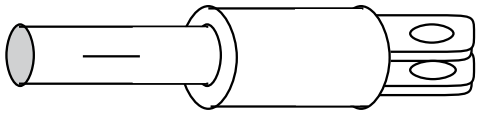
Repair of scores in hydraulic rams

1.



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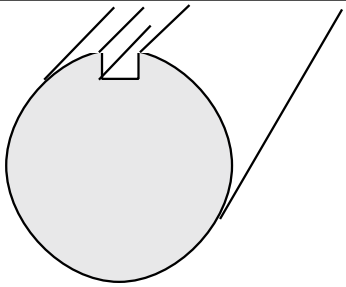

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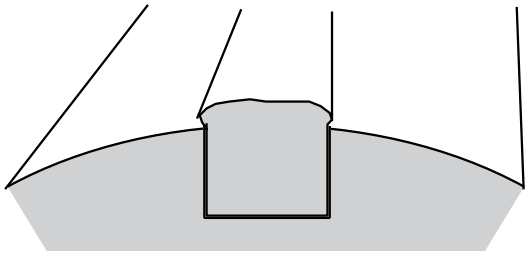

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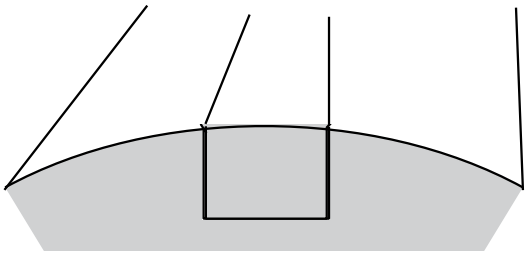

1. Clean the ram thoroughly with Wencon Cleaner.

2. Grind the score down with a wheel grinder, until the grinding score is more or less as wide as it is deep. Clean again thoroughly. To aid cleaning, the ram can be heated, but only to approx. 40° C using hot air or oxygen/gas. Again clean thoroughly with Wencon Cleaner.

3. Mix and apply an adequate amount of Wencon Cream or Rapid (see diagram). Allow the Wencon to semi harden and cut off the superfluous material with a sharp knife. Allow the Wencon to harden completely and then grind the surface clean with a fine grained emery cloth.

4. To have a grinding tool in the right shape, you can use a hardened brick of Wencon Putty to hold the emercy cloth. Apply a thin layer of Wencon Release Agent to a not damaged area of the ram. Mix and apply some Wencon Putty on the ram where you have applyed the Release Agent, and let it cure. After it is cured you can break it of and use it as a tool to hold the emercy cloth.

Variations:

The damage can also be due to a blow, or can be sore arising from contact with electric cables.

If the damage is a result of normal wear and tear and covers a large area, the repair described above is not particularly suitable.

In such cases machining must be recommended after Wencon material has cured. In special cases it is an advantage to turn a mandrel, especially if the ram has a large diameter.

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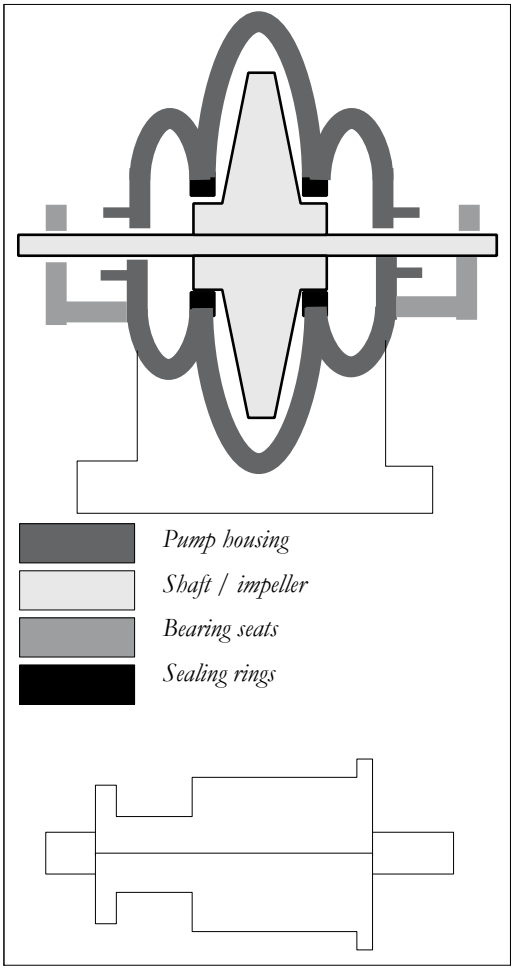
Repair of corroded split-case pump - sealing rings



Apart from the simple and easy repair of the corroded inner surface of the pump housing of this type of pump there are two good reasons for choosing a Wencon application!

These are corroded sealing ring seatings and stuffing box housings.

These two are normally repaired by welding and line boring, but it is a long and costly process which is not in the interest of the owner.

By using the Wencon system we utilize the casting technique which provides the possibility of obviating the necessity of a subsequent boring.

1. Disassemble the upper part of the pump housing and the impeller. Leave the bearings on the shaft.

2. Fit new sealing rings on the impeller placing a layer of foil or paper paper between the ring and the impeller. This ensures centering of the ring. Apply a coat of Wencon Release Agent on the outer side of the ring.

3. Clean the seatings in the lowest part of the pump. Mix and apply Wencon Cream to the seatings and the outer sides of the sealing rings. Assemble the impeller and mount the bearing seats. This moulds the ring seatings to an exact fit to the rings.

4. After curing remove the impeller, finish grind the edges, treat the rings surfaces of the upper part with release agent, and mould the upper part of the housing in a corresponding manner. Remember to insert the gasket during this second moulding.

5. Stuffing box housings are cast in a similar manner, possibly at the same time. The casting template is made of two pipe shells (see diagram) which are tightened on the shaft. These must have the same shape as the stuffing box house is to have. Treat the shells with Wencon Release Agent before casting.

A very big advantage with this method of repair, apart from the cost is the quickness the repair can be made, and the fact that the new rings seatings and stuffing box housings cannot corrode in the future.

Also the roller bearing seatings can sometimes become damaged. These can be renewed to shape by using the same method as above.

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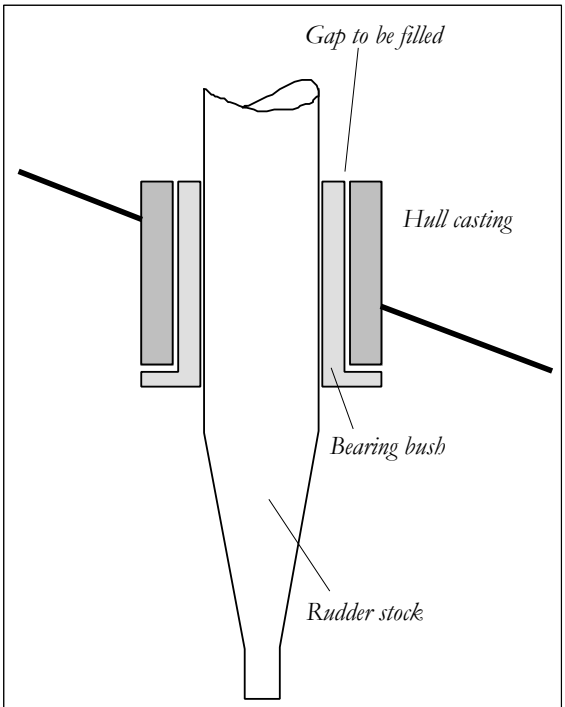
Casting of seat for rudder stock bearing



The compressive strength of Wencon Cream is 860 kg/cm²

Before making an application of this type it is highly recommendable to contact the local Wencon supplier and the classification society in charge.

There are many different types of rudder stock bearings, and the best way to do the application should be found.

The following is the way most of the applications take place.

1. Shot blast the seat for the bearing to SA 2,5. During winter time apply heat.

2. Machine the bushing leaving min. 3 mm (0,12 inch) space to be filled. If the bushing is mounted as shown on the figure, apply Wencon Release Agent to the surface of the bushing. If no bolts are being used to secure the bushing, do not use release agent.

3. Drill injection holes in the hull casting. Four holes in the bottom approx. 30 mm (1,2 inch) from the bottom (spread around the circle), four holes in the middle, and two or four venting holes in the top.

4. Mount the bushing. The shown type can be mounted without use of the stock. Other types can be mounted by help of the rudder stock.

5. Make sure, that the gap is filled in the bottom to prevent injected material to get out. Use Wencon Rapid.

6. The appropriate amount of Wencon Cream or Coating is mixed and injected using compressed air cartridges in a mastic gun. Fill from the bottom and continue until material gets out of the venting holes in the top. Mount a self cutting screw in the holes when not using them anymore.

7. Curing. If the temperature is low, apply heat to the heel 30-40°C (86-104°F). Do not apply heat to the bearing. After approx. 8 hours at min. 20°C (68°F) the work can proceed.

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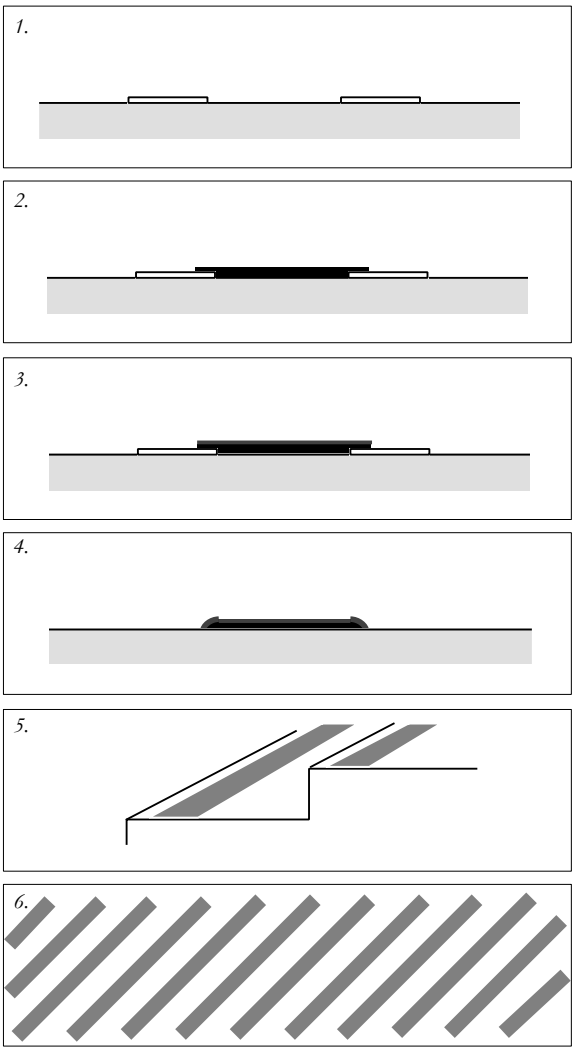
Non-slip surfacing floors - stairs - drive rollers etc.



Wencon Coating and Aggregate are used to ensure non-slip surfaces in different situations. Most common applications are non-slip surfacing of floors, steps, stairs, passages etc. It is of equal interest to name conveyor belt drive rollers, forks on fork-lift trucks, rear loading ramps on lorries, and steps on cars or other transport machines. The system is very simple to use. Apply Wencon Coating to the surface to be treated, and sprinkle Wencon Aggregate on top.

1. Clean the surface as described in the instructions for use. Required patterns can be formed by using a covering strip tape.

2. Mix and apply a thin coat of Wencon Coating.

3. Immediately after applying the coating, sprinkle a layer of Wencon Aggregate on the uncured surface.

4. Remove the tape before curing in order to obtain a nice round edge.

5. When non-slip treating stairs it is important that the strip is placed a few centimeters from the edge of each step, otherwise it is easy to scrape ones legs.

6. In many cases it is not necessary to cover the whole surface. Non-slip can be applied in strips, as shown. A strip width of 3 to 4 cm (1,2-1,6 inch), and intervals of 6 to 8 cm (2,4-3,2 inch) could be a starting point.

When non-slip surfacing drive rollers it is advised to treat the whole surface.

Wencon non-slip surfaces are resistant to oil, salt water, pure water and to most diluted acids.

Wencon Aggregate is normally supplied in two variations, No. 16 and No. 24 (the finer one). It can however be supplied in other variations for special purposes.

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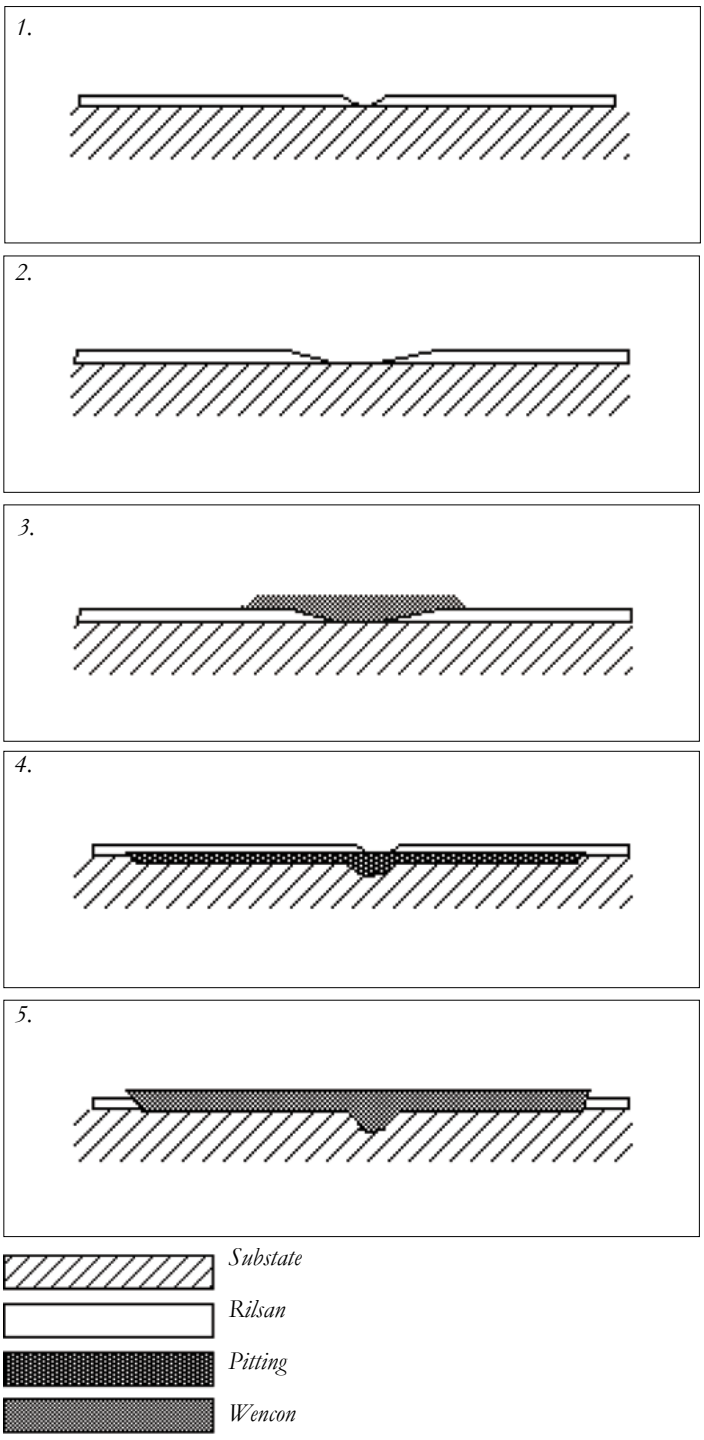
Repair of damages in rilsan coatings



1. Damaged Rilsan or other polyester and/or epoxy powder coating often require a quick solution if substancial damage to the substrate shall be avoided.

2. Grind or shot blast the surface in and around the crack and in an overlab zone. Clean the the area thoroughly using the Wencon Cleaner.

3. Mix and apply a suitable amount of Wencon Hi-Temp. If a quick curing is required, heat the area using a hot air gun.

Variations.

If larger parts of the Rilsan coating has loosened, remove all the loose coating before the application is made.

If the damage is deeper than approx. 1 mm, use Wencon Cream or Rapid to build up the surface prior to coating with Wencon Hi-Temp.

If the damaged area is near a flange, see Application Data Sheet No. 106 for further instructions.

Wencon Hi-Temp is resistant to water, salt water, oil and the most diluted acids and alkalis.

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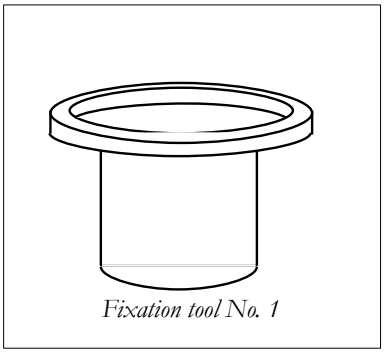
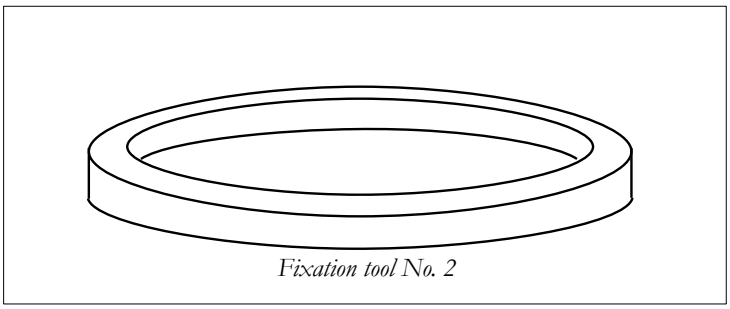
Rudder stock cone application



Fixation tool No. 1



Fixation tool No. 2

Problem:

Corrosion and/or bimetallic corrosion attack on inner surface of rudder blade cone and/or rudder stock cone (with key and key way).

Solution:

Building up a new surface in the inside of the rudder blade cone.

Before anything else is done, it is important that two auxiliary tools are prepared. The tools shall make it possible to centrate the rudder stock and to keep the total length of the rudder stock/rudder blade.

Fixation tool No. 1.

The height is given from the space under the bottom of the stock. The diameter of the upper part is given from the diameter of the bottom part of the stock. After fabrication the tool is stick welded to the rudder.

Fixation tool No. 2.

The diameter of this ring is given from the diameter of the stock on the top side of the rudder. The ring shall be stick welded to the top of the rudder.

These tools will assure thar the WENCON material which is used for creating the new seat for the cone will be casted in an even thickness round the rudder stock.

Surface preparation.

The rudder blade cone shoul be shot blasted to SA 2,5.

Heat it up to a temperature of approx. 20°C (68°F)

Repeat the shot blasting

Take it back to the workshop and install it in an upright position.

If necessary, machine the rudder stock cone to remove corrosion.

Place the rudder blade cone.

Apply a thin layer of Wencon Release Agent on the rudder stock cone. Leave it for drying in at least five minutes and remove excess Wencon Release Agent leaving only a thin film.

The application:

Mix a suitable amount of Wencon Cream and apply it to both the surface of the rudder blade cone and the rudder stock cone. Make sure that enough material is applied.

continue page 2

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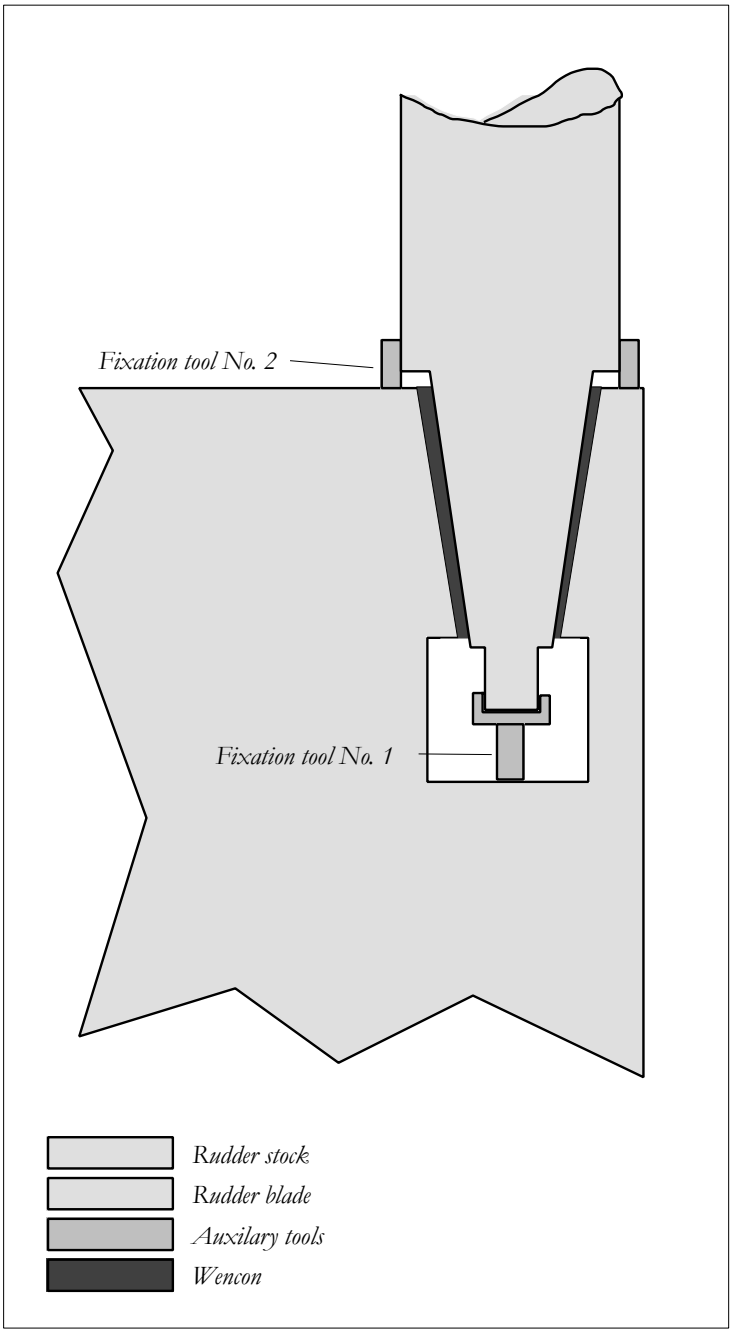
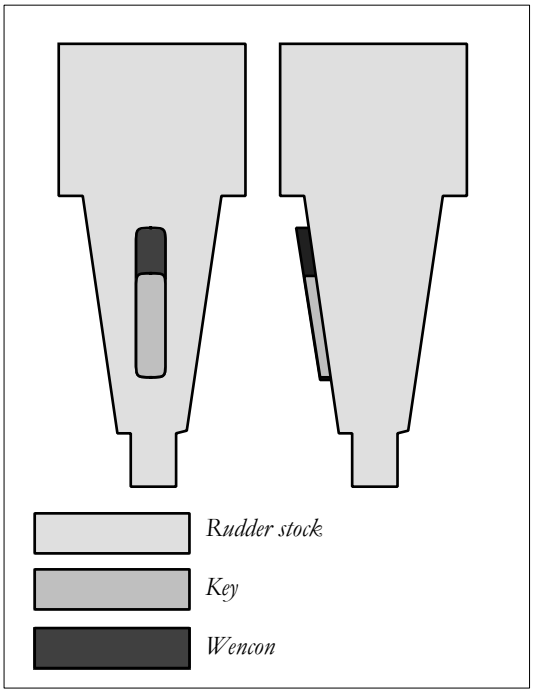
Rudder stock cone application





continue from page 1

Be careful during the application to avoid air entrapment within the Wencon material.

After having applied the Wencon Cream, put the rudder stock into position, leaving excess Wencon material to be squeezed out from the gap.

To ensure the curing within a reasonable time (at winter), apply heat from e.g. two hot air blowers, blowing the hot air onto the rudder blade (not the rudder stock. Leave the application for curing approx. 8 hours.

Variations:

To ensure a proper cast in the key way, it is advisable to extend the key, at least when doing the application. A temporary extension of the key can be modelled using Wencon Putty as shown. Apply release agent on top of it before casting.

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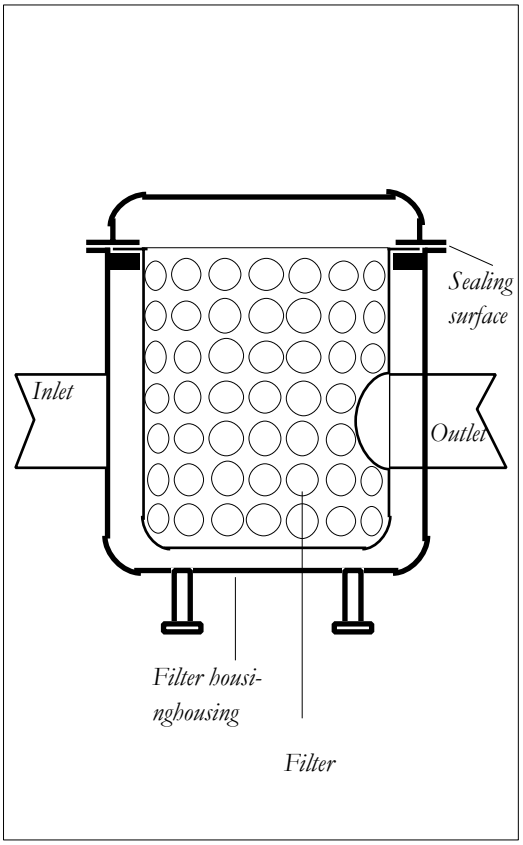
Repair and coating of sea water filters



Sea water filters are very varied in appearance, but despite this they contain the same components internally, viz. a filter housing, a filter, an inlet, an outlet, and last but not least, a sealing surface between filter and housing.

Sea water filters are naturally exposed to erosion / corrosion and bimetallic corrosion.

Before starting the repair it must be decided whether it is to be an emergency repair which can be done on the spot, or a long-lasting renovation which necessitates the filter being taken ashore for shot-blasting. The long-lasting renovation is described below.

1. Disassemble the filter and shot blast the internal surface of the housing to SA 2,5.

2. Heat up the filter housing to approx. 30-40°C (102-136°F) to sweat out the salt. Dry the filter housing for approx. 6 hours by means of a dehumidifier. Then shot blast again to SA 2,5.

3. Fill corroded spots with Wencon Cream or Rapid. If the sealing surface of the filter i corroded, make first an application of a thin layer of Wencon.

4. After the first layer has semi-hardened mix and apply Wencon Coating, white. Apply with a radiator brush from which a half of the bristles have been cut away. When the coat has cured to a sticky consistency, apply a final coat of Wencon Coating, blue.

5. Now clean carefully the sealing surface of the filter and give it a layer of Wencon Release Agent. Then apply a suitable layer of Wencon Cream or Rapid on the sealing surface of the filter housing and fit the filter into place. A new sealing surface is thus established. After curing, the filter can be lifted out again and a gasket can be fitted. In a number of cases the gasket will not be necessary.

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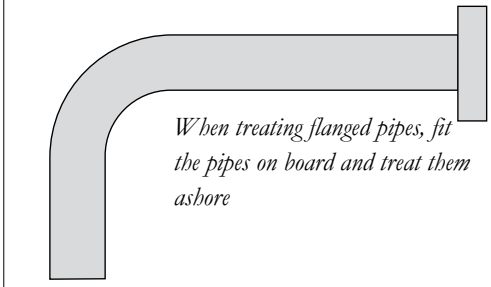
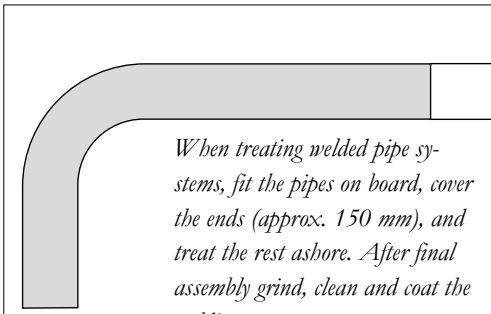
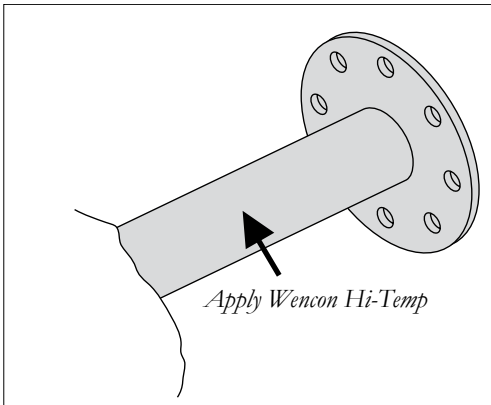
Protection of hot pipes (or cold)



When treating flanged pipes, fit the pipes on board and treat them ashore



When treating welded pipe systems, fit the pipes on board, cover the ends (approx. 150 mm), and treat the rest ashore. After final assembly grind, clean and coat the welding zones.



Apply Wencon Hi-Temp

Hot-water, hot-oil or steam pipes will often be exposed to corrosion on the outer side, due to moisture or water in the insulation. Wencon can eliminate this breakdown with a coat of Wencon Hi-Temp.

Wencon Hi-Temp is a two-component fluid. It can be applied with a paint brush, and quite exceptionally it can be applied at temperatures of over 120°C (248°F).

The cured coating can withstand temperatures up to 160-200°C (320-424°F) depending upon ambient influences.

The coating is very simple to apply and can be made either before or after the pipes have been installed. The most common method, especially with new buildings, is that the pipes are first fitted on board, then removed ashore to be shot-blasted and coated. The only hindrance to making this operation on board is the lack of space.

One of the big advantages with the coating is that damages on the finished coating are easily repaired. The repair is limited to grinding the damaged area and applying a new coat.

Consumption of material. See chapter 1 in the Wencon Repair Manual.

For this application use radiator brushes with half the bristles cut off. This makes the brush well suited to the consistency of Wencon Hi-Temp.

1. Grit blast or grind a belt around the area to be repaired, and clean with Wencon Cleaner.

2. Apply the first layer of Wencon Hi-Temp yellow and let it semicure.

3. While the first layer is still tacky, apply the next layer of Wencon Hi-Temp Green.

4. The repair can be reinforced by using Wencon Reinforcement Tape wrapped tight in the wet Hi-Temp.

5. The finished layer thickness shall be 600-800 microns.

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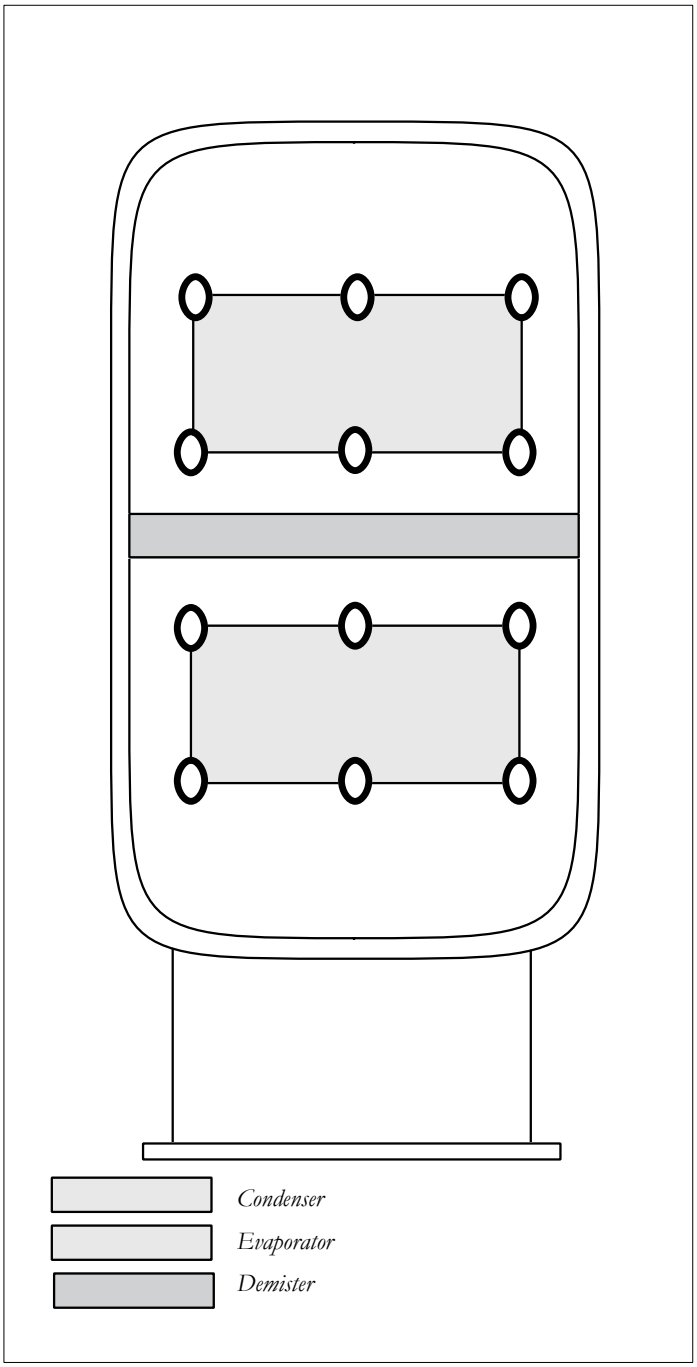
Repairing fresh water generators



Fresh water generators made of coated mild steel sometimes suffer from salt water penetration through the coating. The severe conditions inside the generator will eventually cause corrosion problems. It is ideal to have the coating repaired just after having noticed the damage.

Wencon Hi-Temp is meant for this repair, and it will adhere to all common coatings like epoxy, polyester and even thermo plastics.

1. Tear off loose and damaged coating.

2. Shot blast or grind the affected area including an overlap of min. 5 cm (2 inch).

3. Clean the area using Wencon Cleaner.

4. Apply the Wencon Hi-Temp as described in the instructions for use. Apply two times, each approx. 300 µ (3/10 of a millimeter).

5. After curing, the surfaces should be cleaned using the Wencon Cleaner, and the application is finished.

Variations.

If the generator body is badly corroded, apply the Wencon Cream or Rapid to rebuild the surface, before the Wencon Hi-Temp is applied.

The Wencon Hi-Temp is not approved for use in combination with potable water, but in cases, where there is a demand or requirement for such, apply a layer of approved two-component paint as a top coat. Apply this final layer before the Wencon Hi-Temp has fully cured to assure the best possible adhesion.

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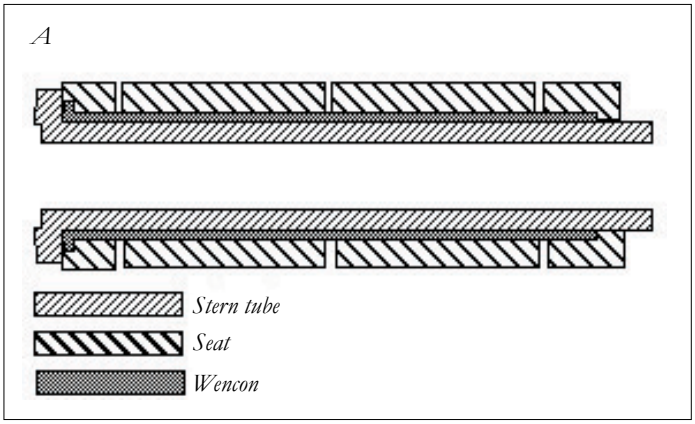
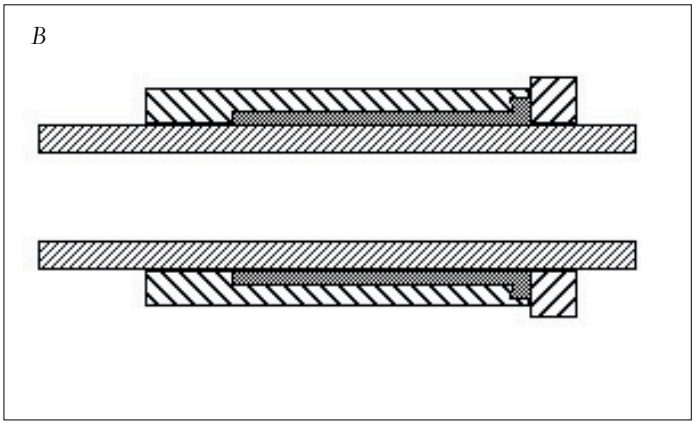
Casting of seats for stern tubes





Casting of seats for stern tubes becomes more and more popular. There are a number of advantages in the technique; better mating surfaces, no demand for line boring, just to mention a few.

The technique is very simple.

1. The seat shall be given a rough and clean surface. The diameter shall be approx. 8 mm (0,32 inch) larger than the stern tube.

2. Drill holes in the bottom of the seat (a) for injection. The number of holes depends on the length. Drill holes in the top for ventilation. All the holes may be tapped to make it easy to mount bolts after injection has been finished.

3. In the bottom (b) an O-ring or the like creates a seal to avoid casting material to escape.

4. Mount the stern tube in the desired position. Seal the outer flange with a sealant or with Wencon Rapid.

5. The temperature of the working area shall be 15-20°C (51-68°F). Avoid heating of the stern tube.

6. Use an air driven mastic gun for the injection.

7. Calculate the approx. consumption of casting material.

8. Mix one unit of Wencon Coating and fill it in an empty cartridge (can be supplied from Wencon) and inject into the rear hole. Repeat this until the casting has reached the next hole, plug the first hole and continue in the second. Repeat until the entire gap is filled.

The technique has been approved by B.V. and others.

The bottom drawing shows the other end of a stern tube that shall be treated the same way.

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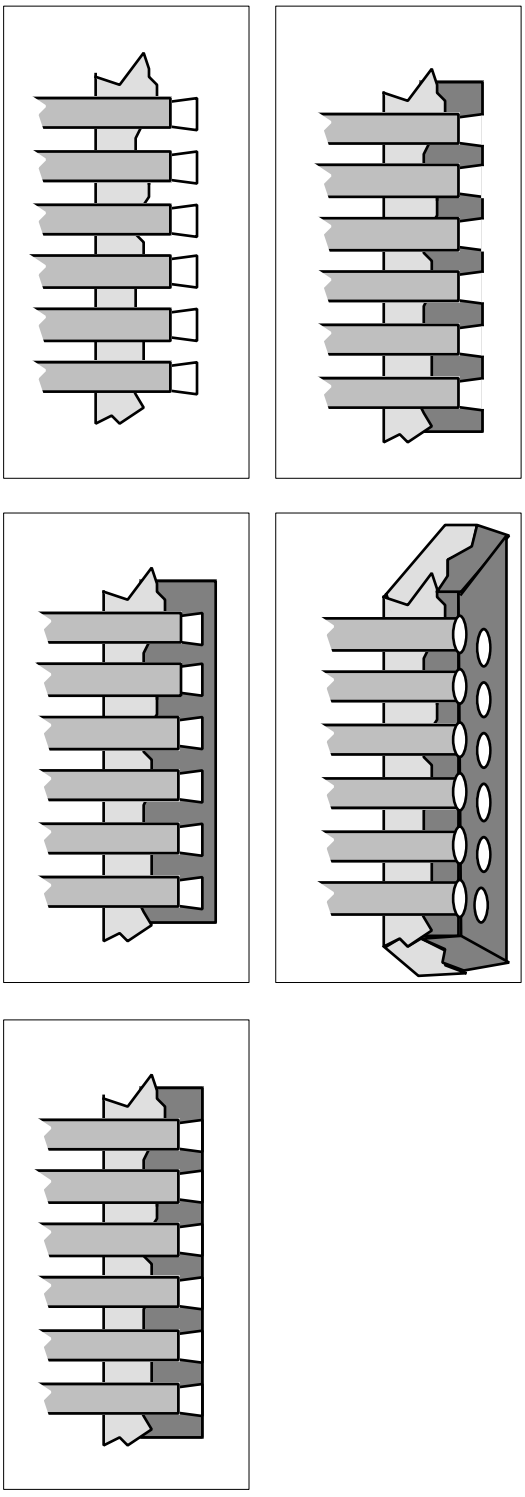
Repair of corroded tube end plates



Corroded tube end plates provide an excellent example of how a surface repair should be carried out. As in the many Wencon applications the accuracy of the preparatory work is of great importance.

1. Insert rubber plugs in the tubes to protect these when shot blasting. Shot-blast the tube end plate to SA 2,5. Then allow it to stand in warm and dry conditions (use dehumidifier) to sweat out salts and water. Repeat the shot-blasting to SA 2,5.

2. Replace the rubber plugs with cork plugs treated with Wencon Release Agent, and having a diameter 2 mm smaller at the one end than the inner diameter of the tube, 2 mm (0,08 inch) larger at the other end.

Insert the cork plugs in the tubes, and to ensure they sit level, knock into plan by using a piece of wood or the like and a hammer.

Mix and apply a thick layer of Wencon Cream, and cover the cork plugs completely.

3. After curing, grind the surface to develop the plugs again. Because of this grinding it is not recommended to rebuild a sealing surface which mates with the end cover, if the surface is not corroded. If, however the sealing surface is in need of repair, wait until the above application has been done, and then build up the sealing surface as follows. First apply a coat of Wencon Release Agent on the flange, then apply a coat of Wencon Cream on the sealing surface, and then fit the cover into position before curing.

4. Remove the plugs. Preferably by means of a wooden screw in a drilling machine that can rotate in both directions. You can also push them out from the opposite end with a rod, or use compressed air.

5. Finally, apply two coats of Wencon Coating (see instructions). Use a paint roller for this - a thin one with hard felt covering - to avoid coating material coming into the tube ends.

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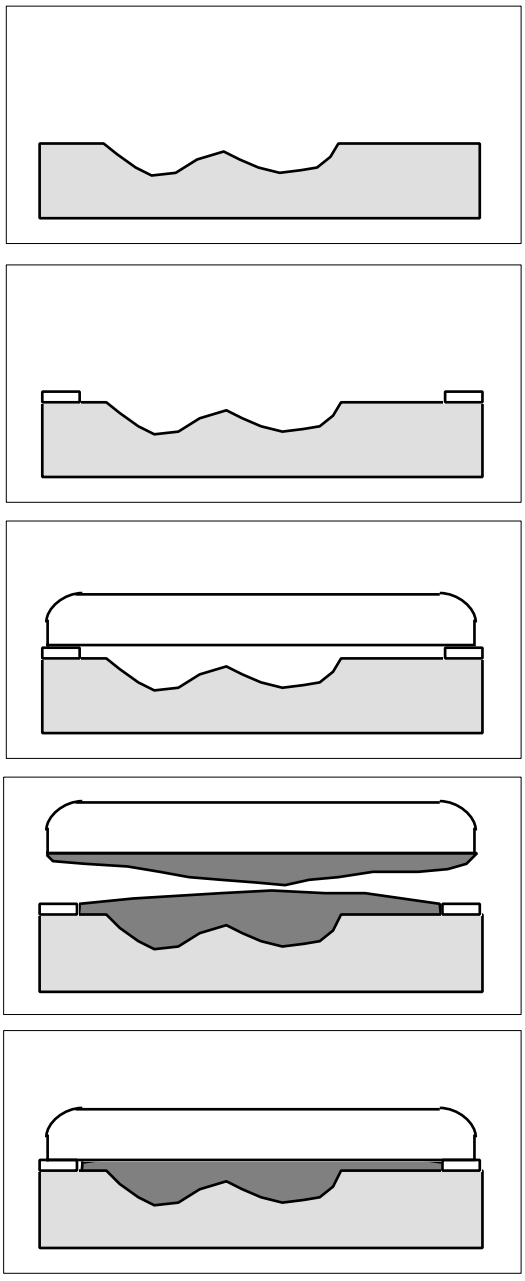
Casting support for wear plates



It is often the case that wear plates are replaced too late. This results in excessive wear of the surface of the seat for the plate. Welding and machining of this surface can be a costly affair. By using the Wencon application these surfaces can easily be built up to exact alignment with the wear plate. In many cases it is even possible to obviate the necessity of machining the rear side of the wear plates. The procedure is straight forward.

1. Clean the worn surface. The best degree of adhesion is obtained with shot blasting.

2. On each seat, fix four small iron shims to guide the wear plate during the casting. They must ensure a minimum casting height of 2 mm (0,08 inch), and must be removed after casting.

3. Before casting, check the plate for correct positioning. Then apply a film of Wencon Release Agent to the rear of the plate, to prevent adhesion between the plate and Wencon. Allow the release agent to dry for at least 5 minutes.

4. Clean the worn surface with Wencon Cleaner. Mix an adequate amount of Wencon Cream. Build up a layer, as shown in the diagram, on both the seat and the plate. Allow some 30% of the Wencon to be squeezed out when fitting in order to ensure a complete support.

5. Press down the plate on to the shims, either by means of the bolts that holds the plates or by means of a jack.

Thereafter remove the excess Wencon material and the job is finished. Curing time depends on temperature. At 20°C (68°F) Sit will be about 10-15 hours. Curing time can be shortened at higher temperatures. After curing, remove the shims, and retighten the plates to the required tension.

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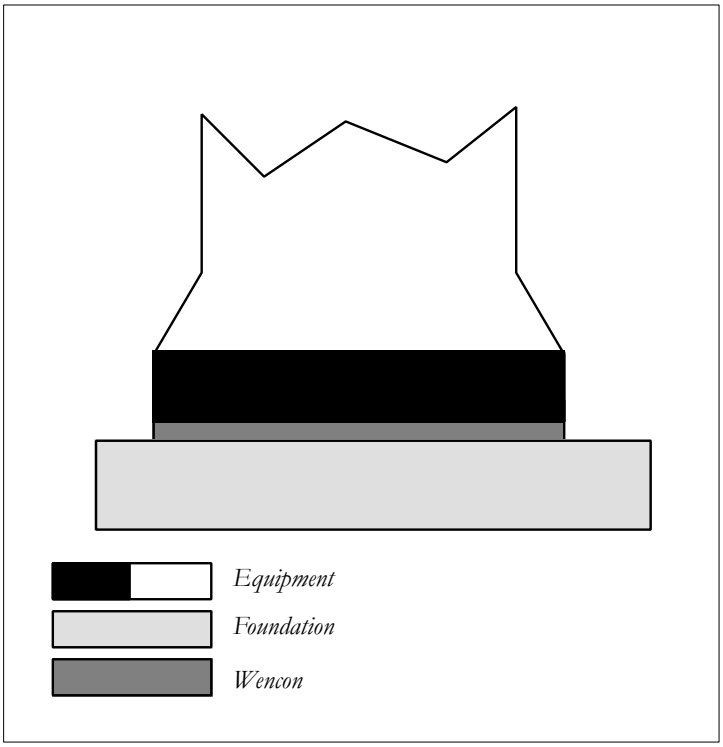
Shocking of engines, generators and other equipment



Shocking, casting of resins for the purpose of creating a total fitness between foundation and a piece of equipment has become more and more common in the marine industry during the past decade.

It is a very quick way of securing an engine, and specially when doing repair on a ship, the time consumption is of the greatest importance.

Wencon supplies a small and efficient range of products for these kind of applications. Wencon Cream is paste consistency for injection and Wencon Coating for pouring and injection.

The Wencon range is known for its quick curing and for the limited amount of product needed. Whilst most shocking compounds should be applied in a thickness of about 25-35 millimeters (1,0-1,4 inch), Wencon would do with only 4-5 mm (0,16-0,2 inch) and still cure perfectly within a short time.

Usually the most efficient way of shocking would be by drilling holes in the upper plate and inject the Wencon into the gap. This secures a perfect mould leaving no air entrapments in the resin.

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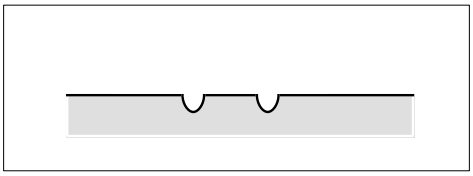
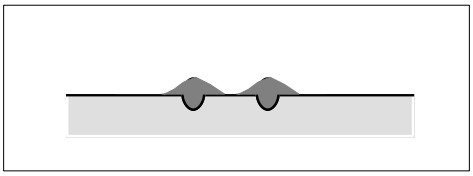
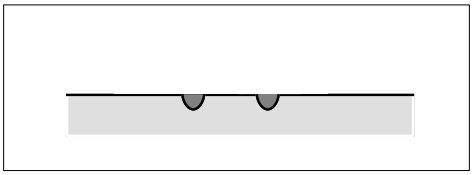
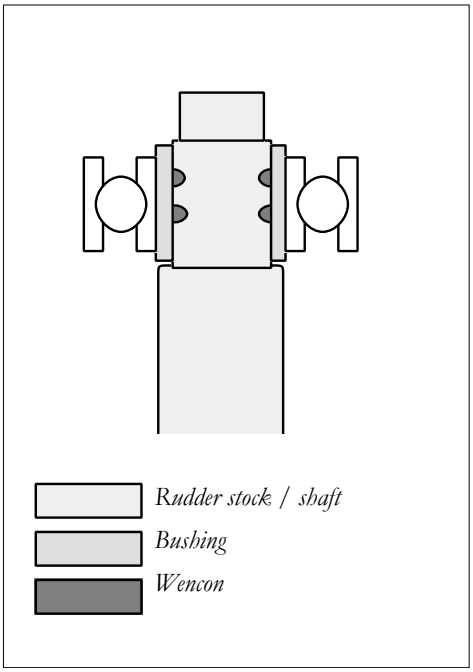
Repair of scored rudder stock / shaft









Whenever removing a bushing, especially a heat shrinked one, from a rudder stock or any other shaft, there might be created scores. In most instances, this damage can be repaired with Wencon.

The obvious advantage is the fact, that no heat is required for the application; unlike welding. The technique is very simple.

1. Grind the scores with a wheel grinder to bare metal (round shapes). Degrease the area with Wencon Cleaner.

2. Mix and apply a suitable amount of Wencon Cream or Rapid as shown in the fig.

3. After a couple of hours, most of the excess material can be cut away using a knife. After full cure, the surface can be ground with emery cloth.

When remounting the bushing, do not heat above 100°C (212°F).

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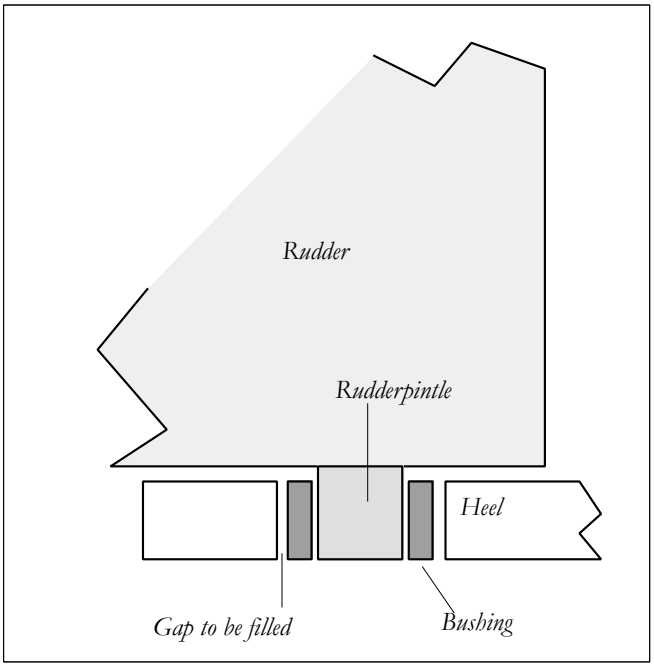
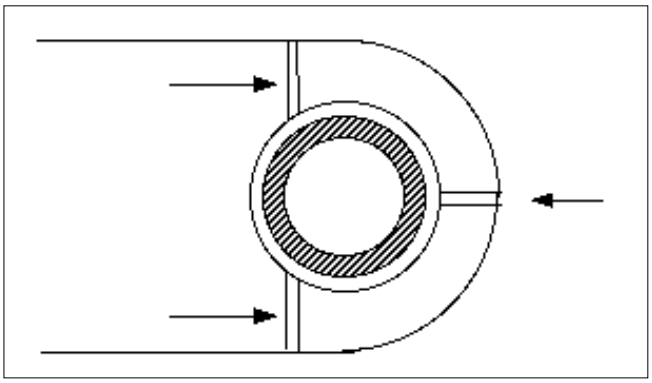
Casting of seat for rudder heel bushing





Oversized bearing houses for the rudder pintle bearing is very common. The deterioration of the seat is caused by bimetallic corrosion.

The Wencon solution offers the advantage of not getting the corrosion again. The Wencon cannot corrode.

Before making the application, consult the local Wencon supplier and the classification society.

1. Shot blast the bearing housing to SA 2,5. During winter time, apply heat.

2. Machine the bearing leaving min. 3 millimeter (0,12 inch) space to be filled.

3. Drill 2 or 4 injection holes in the heel.

4. Mount the bearing and secure it either using the rudder pintle or by stick welding it to the heel.

5. Make sure, that the gap is filled in the bottom to prevent injected material to get out. Use Wencon Rapid.

6. The appropriate amount of Wencon Cream or Coating is mixed and injected using compressed air cartridges in a mastic gun. Mount self cutting screws in the holes when not using them anymore.

7. Curing. If the temperature is low, apply heat to the heel 30-40°C (70-93°F). Do not apply heat to the bearing. After approx. 8 hours at min. 20°C (68°F) the work can proceed.

The same technique is used for creating fit between rudder pintle and its seat.

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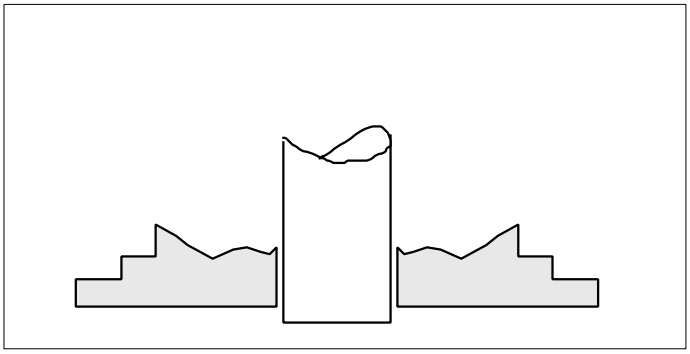
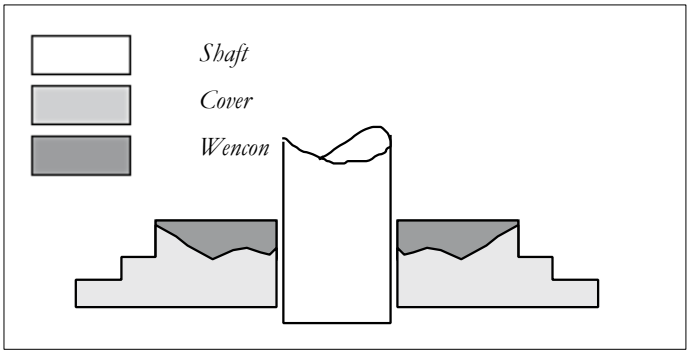
Repair of corroded pump casing cover





Corroded pump casing covers are very common problems. This problem can be solved very easily with Wencon at a fraction of the cost of replacement.

Procedures employed:

Surface preparation:

1. Work is shot blasted to SA 2,5.

2. Salt sweating by using a burner or leaving the part for 12-24 hours. Steam cleaning may also work.

3. Re-blasting to SA 2,5.

4. Cleaning with Wencon Cleaner.

Rebuilding:

1. Build up the work piece to it´s original shape using Wencon Cream or Rapid.

Coating:

1. After rebuilding and partial curing, brush apply a layer of Wencon Coating, White over the entire internal surface.

2. Finish with a coat of Wencon Coating, blue.

Options:

The center aperture may be casted using Wencon Release Agent on the casting piece (bearing bush) and reassembling the impeller shaft to provide centrifica-tion.

The space between the casting piece and the body may be filled up with Wencon Cream or Rapid and left to cure.

After curing, the impeller shaft and bearing may be disassembled.

A perfect cast on the body would then be achieved.

Alternately, the center shaft area can be overbuild with Wencon material, left to cure and hereafter machined to size.

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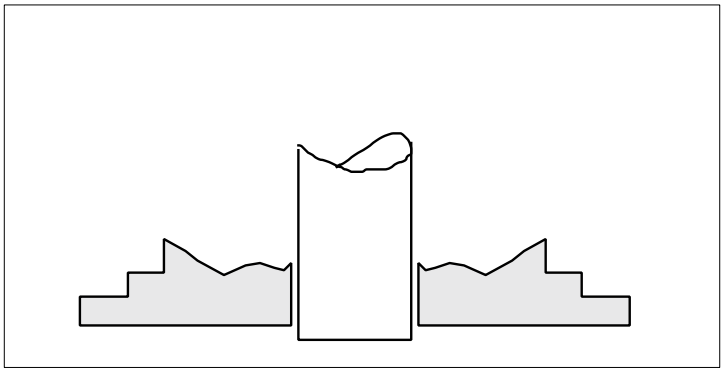
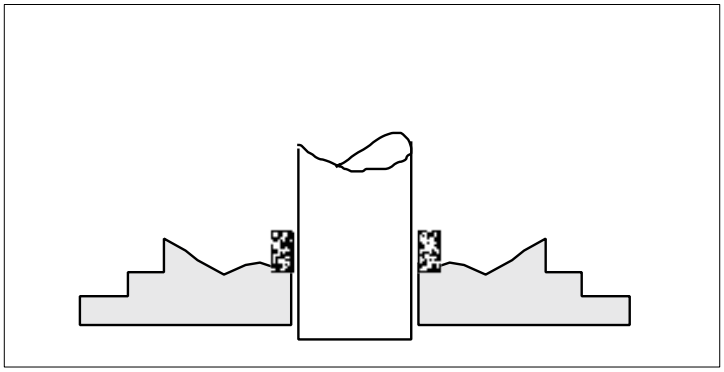
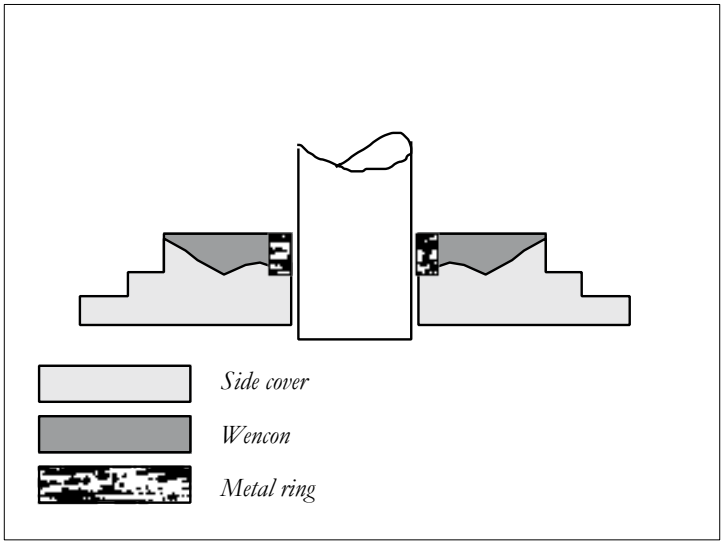
Repairing side cover in pump casing







When a pump housing suffers from deterioration, which is caused by some degree of wear, for instance in pumps pumping sand and stones, it is advised to use not only the Wencon material, but also to reinforce it using steel.

In this case, the side cover suffers from corrosion and wear in the inlet.

1. Shot blast the cover to SA 2,5. Heat it up to get out the salt, and re-blast it to SA 2,5.

2. Create a steel ring having the same inner diameter as the inlet, and weld it into the cover. After the welding, fill the space behind the ring with Wencon Cream or Rapid, filled with Wencon Aggregate in weight ratio up to 1:1. The Aggregate will increase the wear resistance of the Wencon material.

When repairing other parts of those pumps, be aware, that it is not likely, that the Wencon material will stand the impact of big stones, so if the inner surface of the pump shall be made, the Wencon should only act as a support for wear segments. See Application Data Sheet No. 119.

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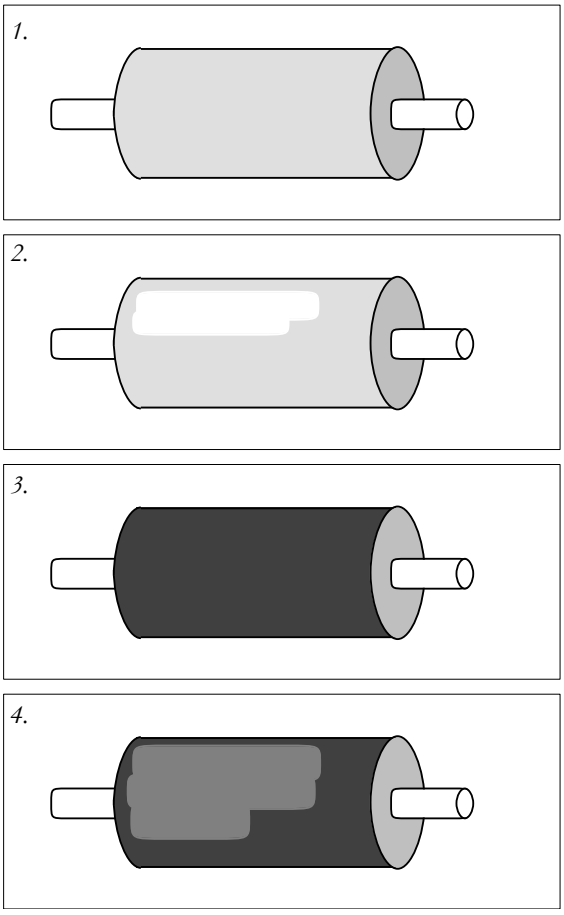
Non-slip coating of rollers



In many industrial units, there is an extensive use of rollers having a non-slip coating.

Repair or refurbishment of the coating requires most often dismantling and shipping of the roller outside the company. Costly and time consuming.

The benefits of using Wencon for this application include the fact, that most applications can be done on site, sometimes even without dismantling, which offers obvious advantages.

Furthermore, the Wencon coating can be repaired on site as well.

1. Surface preparation. Grit blasting to Swedish Standard SA 2 1/2 or grinding to bare metal. Grit blasting being the better, grinding being the only solution if the roller is not dismantled. After grinding, degrease the surface with Wencon Cleaner.

2. Apply a layer of Wencon Coating. Use spatula or brush (angled brush, cut off half the length of the bristles). The thickness applied shall correspond to the type of Wencon Aggregate used. Emphasize an even thickness.

3. Apply the Aggregate (No. 16, coarse or No. 24, fine) into the wet coating. If possible, rotate the roller during the application.

Leave the roller for curing. Curing time depends on temperature. The higher temp., the shorter curing time. Curing time at 20°C (68°F) is 24 hours, at 60°C (140°F) 4-6 hours.

4. If the finished surfaces is more rough than expected, you can apply a thin coat of Wencon Coating on top of the Aggregate. If you want to apply a very thin coat on top. you can thin the product, using up to 10% alcohol.

If you find the Aggregate either too coarse or too fine, you can ask for other types.

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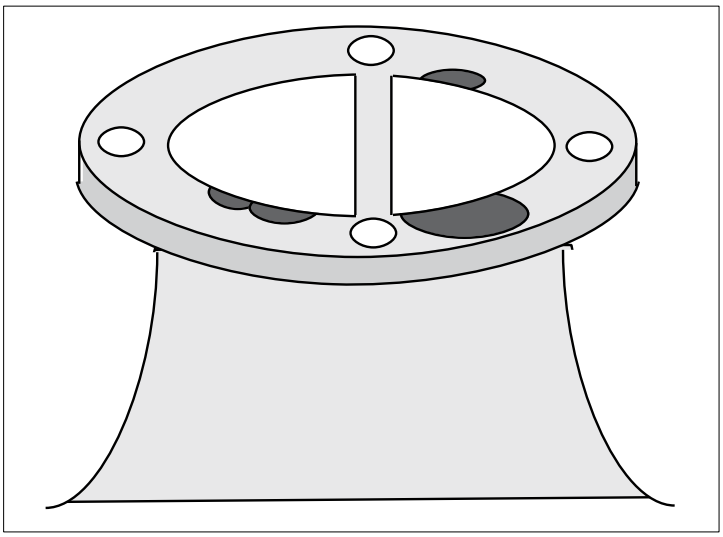
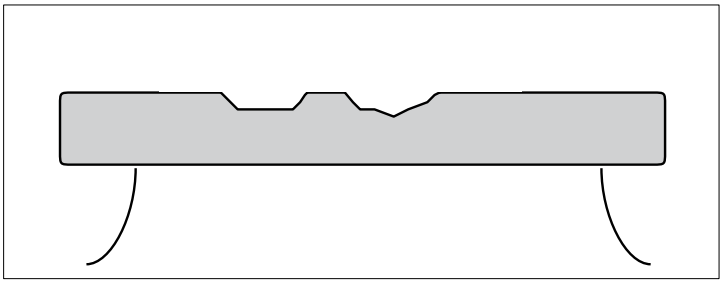
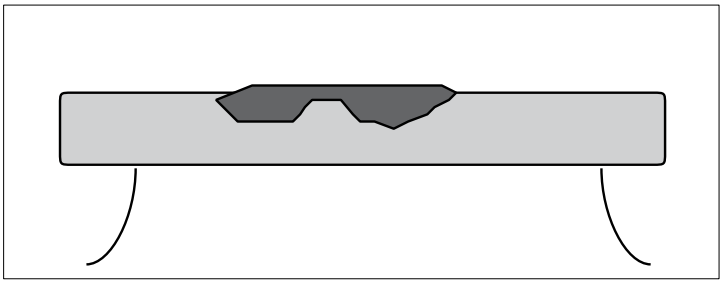
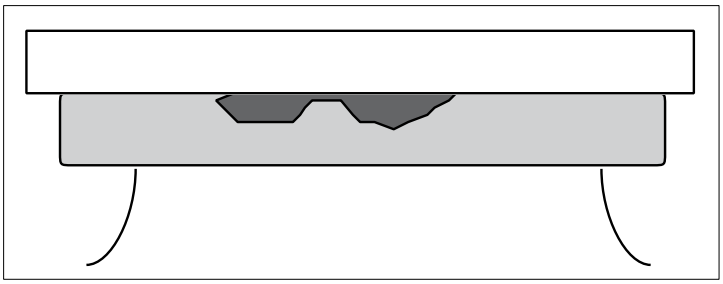
Repair of corroded flange









Corroded flanges can be repaired, using Wencon. The obvious way would be by shut blasting the flange, applying of Wencon, letting it cure, and machine the flange to size. This is not always possible, so here is a way to do it on site.

1. Dismantle the flange and clean it with Wencon Cleaner.

2. Prepare the corroded area by grinding or needle gunning (sharp needles).

3. Clean it though roughly with Wencon Cleaner and apply a suitable layer of Wencon Cream or Rapid on to the corroded area.

4. Mount and hold a template to the flange until full cure has occurred. The template can be made in thick plastic plate (polyethylene) to avoid the use of release agent. If it is made of metal, use Wencon Release Agent on the template to avoid adhesion.

After curing, remove the template, and form the holes in the flange by the use of a round file.

If a number of flanges on i.e. a manifold should be in line, use a big template covering all the flanges at the same time.

It is also possible to use the engine, being the mating surfaces as a template.

In this case, it is essential to dismantle the manifold after curing and remove excess material.

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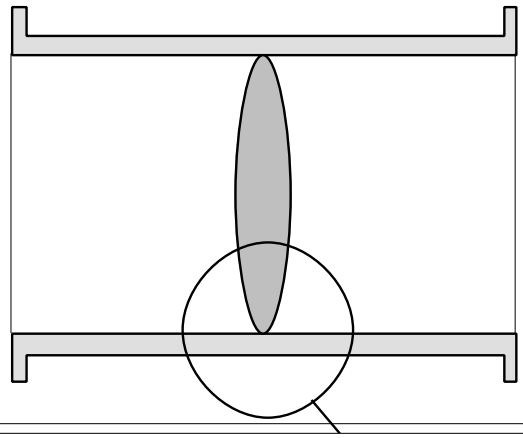
Repair of corroded butterfly valve

1.



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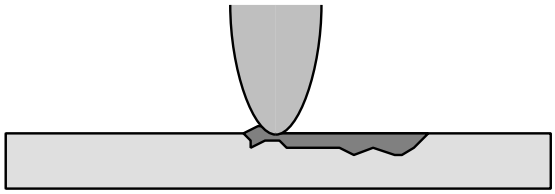

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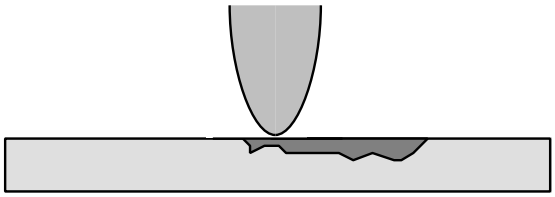

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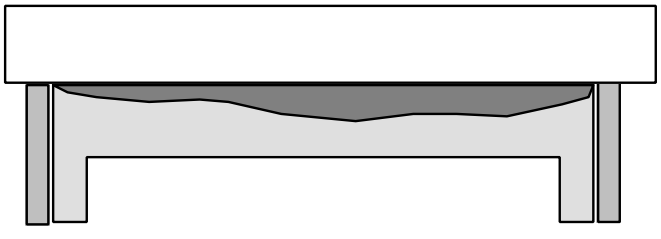

Valves are normally repaired because of either bimetallic corrosion or erosion / corrosion.

In both instances, the surface preparation is very important.

Grit blasting to Swedish Standard SA 2 1/2. If that is not possible, a thorough grinding followed by degreasing must take place.

Method 1.

Open the valve, and apply Wencon Release Agent on the valve plate.

Mix and apply a suitable amount of Wencon Cream or Rapid into the corroded area in the valve housing and close the valve.

A perfect fit between the plate and the housing is hereby created, see fig. 1. After curing, open the valve and grind away excess material.

If the plate is corroded, this must be repaired prior to the housing.

After the repair, the entire surface should be coated with Wencon Coating to prevent further corrosion.

Method 2.

Disassemble the valve, and grit blast the parts.

Apply Wencon Cream or Rapid to the corroded areas (or the whole internal surface), leave it for curing and machine it to the right measures.

After machining, apply Wencon Coating to prevent future damage.

If the housing is badly corroded, it can be advantageous to make two plywood "flanges" to help give the right surface inside.

Use a big template for the application see fig. 4.

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Pipes repair - emergency - Wencon Pipe Tape

1. Empty and clean the leaking pipe and grind it with emery paper or the like. For higher pressure, use Wencon Putty (se fig. 6)

2. Unpack the Wencon Pipe Tape and submerge it in water for 30-40 seconds.

3. Wrap the Wencon Pipe Tape tight around the pipe. (min. 9 circles)

4. Dip the gloves in water and smoothen the surface with your hands.

5. After 2 minutes the products semi cures, and after 15 minutes it is fully cured (@ 20°C (50-68°F).

6. If the pipe cannot be emptied, use the Wencon Putty. Eventually hold it in place with a small metal plate and a steel band, before applying the pipe tape.

Technical Data

Pipe pressure without Wencon Putty: 10 Bar*)
Pipe pressure with Wencon Putty: 50 Bar*)
Flexural strength: ASTM D709 111 N/mmsq.
Tensile strength: ASTM D638 172 N/mmsq.
Compression strength: ASTM D695 180 N/mmsq.
Adhesion at one-inch single overlap: 19 N/mmsq.
Dielectric strength: 16 KV/mm

Temperature Resistance

Continuous: 120°C (248°F)
Peak: 150°C (310°F)

Chemical Resistance

Water, salt water, oil, diluted acids and alkalis.

Handling Precautions

Read the instructions for use and the Material Safety Data Sheet

*) Laboratory tests have shown much higher values, but the mentioned values will count for repairs done in situ. Users are advised to make their own tests if in doubt.

Wencon Pipe Tape Usage Chart

Pipe Diameter	Pipe Circ.	9 x Circ.	Wencon Pipe Tape	Wencon Pipe Tape	Max pressure with Putty •)	Max pressure without Putty •)
mm	mm	mm	5 x 150 cm	5 x 350 cm	Bar/P.s.i.	Bar/P.s.i.
15	47	423	One		50/725	10/145
20	63	567	One		50/725	10/145
25	79	707	One		50/725	10/145
32	101	905	One		50/725	10/145
40	126	1131	One		50/725	10/145
50	157	1414	One		50/725	10/145
80	251	2262	Two	One	45/652	10/145
100	314	2828	Two	One	40/580	10/145
125	393	3535		One	35/510	10/145
150	471	4242		Two	30/430	8/120
200	628	5656		Two	25/360	5/70
250	786	7070		Two	20/290	5/70
300	943	8483		Three	10/145	5/70

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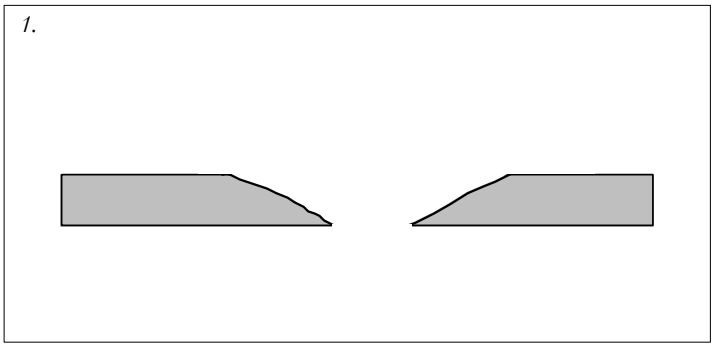
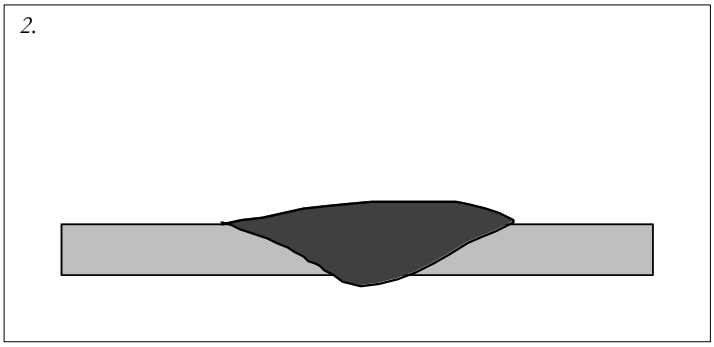
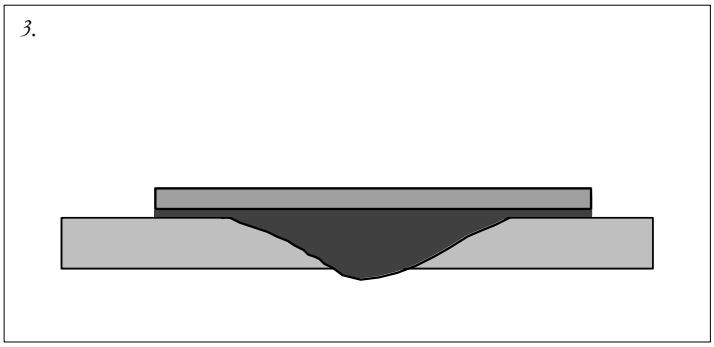
Repair of leaking tanks







There are many way of repairing leaking tanks.

Basically, the best result is obtained by repairing on the pressure side.

Often, when a tank is leaking, it is corroded not only where the leak is, but also in the surrounding area.

By repairing only the small area that leaks, often leads to further repairs in the near future.

1. Surface preparation. Grit blasting to SA 2 1/2 or thorough grinding to bare metal. Degrease the surface using Wencon Cleaner. Prepare an area larger than the damaged area. If the substrate is impregnated with oil or salt water or the like, heat the area with hot air gun or gas torch, and repeat blasting or grinding. Degrease again.

2. Mix and apply a suitable amount of Wencon Rapid. Make sure to get a good contact between the Wencon and the substrate. Avoid air entrapment.

3. For extra security, it is advisable to reinforce the application by the means of a steel plate, grit blasted or ground on one side, and fixed into the Wencon before curing. If the surface of the substrate is shaped, give the plate the approximate same shape before bedding it into the repair. Make sure, that the plate will get in good contact with the Wencon material.

4. To protect against further bimetallic corrosion, treat the entire surface with Wencon Coating, white and blue.

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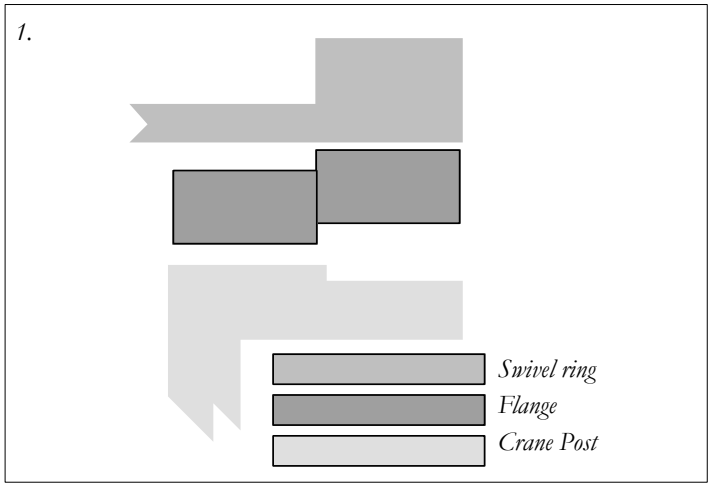
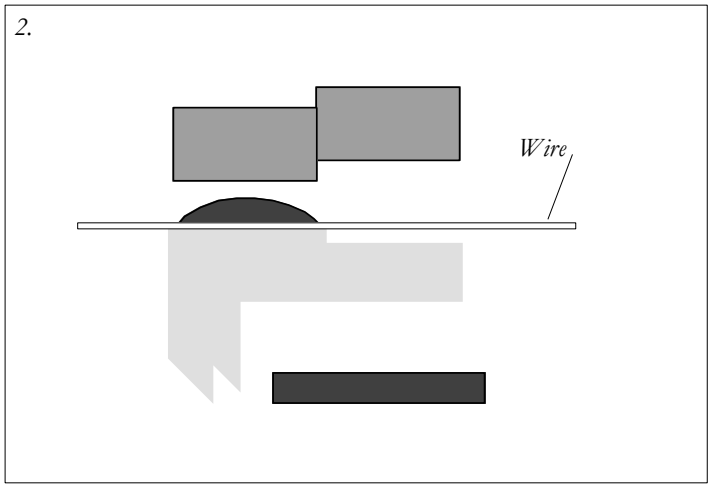
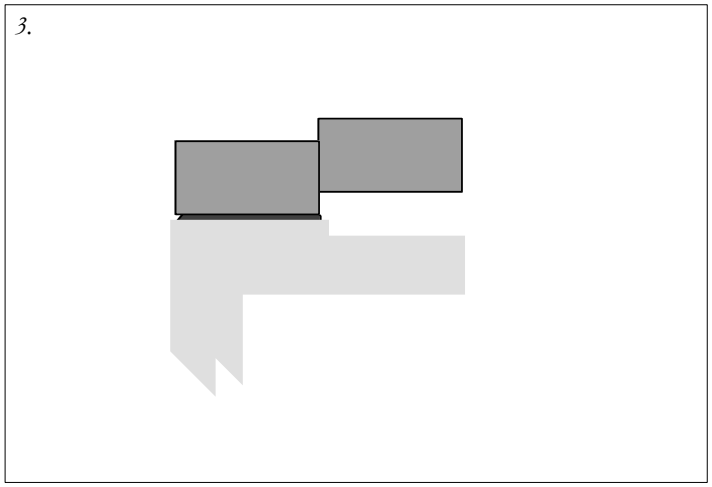
Casting support for swivel ring on cranes







There can be many reasons for gaps between a flange and the swivel ring to mate the surface of the flange. Poor machining, no machining, distortion arising from welding, corrosion, bimetallic corrosion etc.

1. Before we can consider the solution being a Wencon matter, we must know the compression of the swivel ring. Usually we would require at least 5 - 10 N/mmsq.

   Wencon Cream offer us a compressive strength of 86 N/mmsq., so in by far the most cases, a Wencon solution would be superior to any other solution.

2. The job is simple. Lift the swivel ring to enable grinding of the flange top. Clean the flange top using Wencon Cleaner.

   Apply Wencon Release Agent to the bottom surfaces of the swivel ring. Allow to dry for 5-10 min., and remove eccess. Also threat the bolts.

   Mix and apply a suitable amount of Wencon Cream. The final layer must be min. 2-3 mm (0,08-0,12 inch). To avoid air entrapment, apply thickest on the middle.

   For every 20 cm, place a 2 mm (0,08 inch) metal wire (welding electro de) across the flange to create an even casting.

3. Place the ring in position, and empty the bolt holes for Wencon material. Mount the bolts, but do not tighten them.

After curing, loosen the bolts, and take away the wire.

The job is done, and you can mount the swivel ring.

If you have got air entrapment, these can be repaired easily, by grinding the dent, and fill it with Wencon Cream, let it cure and grind away eccess material.

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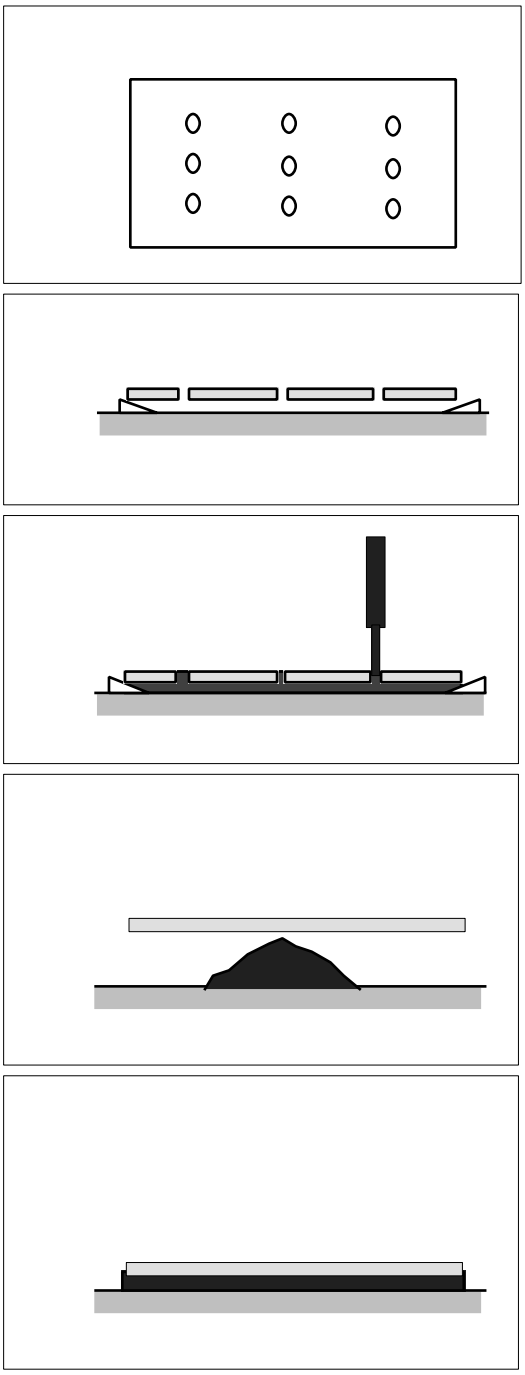
Fixation of doubler plates on deck



Often, it is not possible to fix a doubler by welding. For instance on a tank top.

Here is given two methods for the application.

Method 1.

1. Drill holes in the doubler 6-8 mm (0,24-0,32 inch) Ø for injection. Make one hole for every 400 cmsq. Grind or shot blast the mating surfaces to bare metal and degrease it with Wencon Cleaner.

2. Place the doubler on 4 wedges in the desired height min. 3-4 mm (0,12-0,16 inch).

3. Wencon Cream or Coating is mixed, filled into empty cartridges and injected through the holes. Begin in the middle area and work your way out. Make sure the gap being totally filled. After curing (see instructions leaflet) the job is finished.

Method 2.

4. The job can be done avoiding the drilled holes. Mix and apply Wencon Cream or Rapid as shown in fig. 4. Make sure, that there is enough material to be squeezed out from the gap during the mounting.

5. Mount the doubler in the wet material and make sure, that excess material is being squeezed out all way round the plate to be sure of total fixation. It may be advantageous to apply a very thin layer of Wencon on both mating surfaces initially. Let it cure before loading.

Method 2 is the quickest, but has limitations regarding the size of the doubler.

If method 2 is used on very irregular surface, it is recommended, that Wencon Cream or Rapid should be used to create an even surface before the mounting.

The larger doublers the more difficult it will be to press the plate in position.

Apply vibration by the means of a pneumatic hammer or the like on the top.

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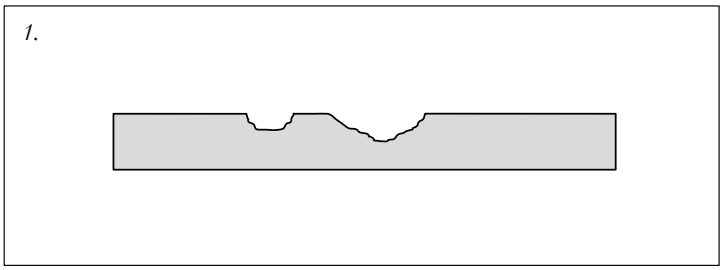
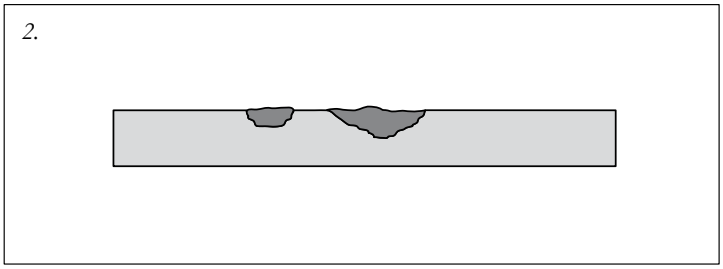
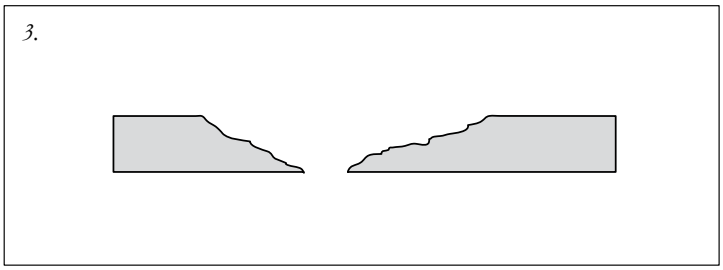
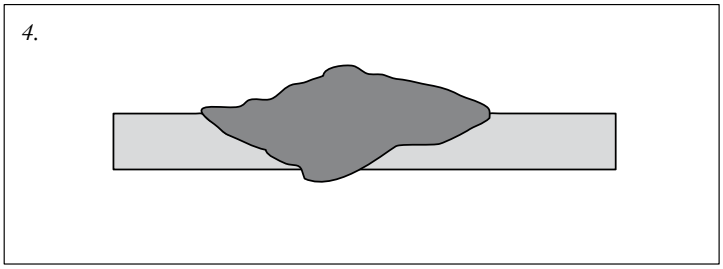
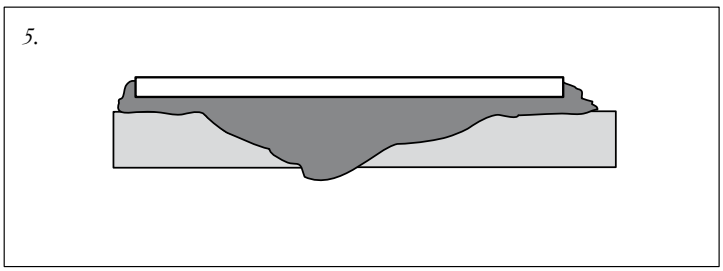
Repair of corrosion on deck











There are two good reasons to repair corrosion attack on deck using Wencon. Wencon material has a penetration time of over 15 years, and it has an outstanding adhesion to metals.

1. Prepare the surfaces to be treated with shot blasting to SA 2 1/2 if possible, or grind the surfaces to clean metal. Clean it using the Wencon Cleaner.

2. Mix and apply a suitable amount of Wencon Cream or Rapid, and leave it for curing. After curing 4 - 8 hours, it can be painted.

3. In situations, where the corrosion has come through the deck, it is advised to put on a doubler. Do the preparation as above.

4. Apply the Wencon as shown.

5. Press firmly a small steel plate, already ground and degreased on one side, into the uncured material, to provide strength.

Follow the instructions in the instruction for use, supplied with the material.

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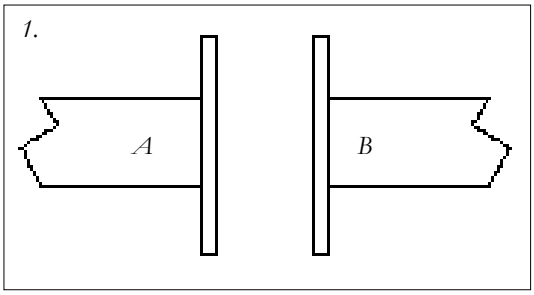
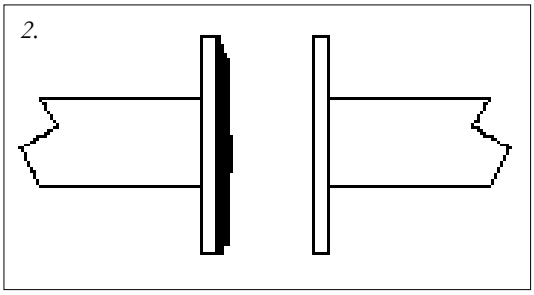
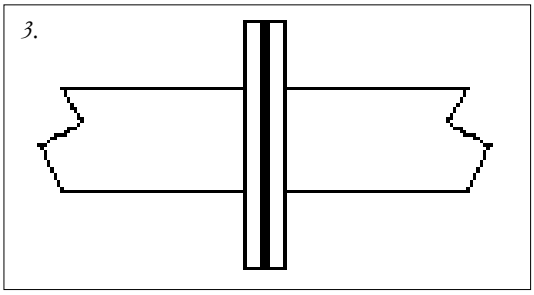
Hard seal for flange faces, gaskets, bushings etc.







Wencon provides a very simple, quick and long lasting technique for creating mating surfaces on i.e. flange faces, bushing seats, conical couplings of shafts and/or pipes, condensers, heat exchangers, bearing seats, etc.

Wencon is for this application supplied in four versions.

Wencon Cream, paste consistency long pot life, heat resis Wencon provides a very simple, quick and long lasting technique for creating mating surfaces on i.e. flange faces, bushing seats, conical couplings of shafts and /or pipes, condensers, heat exchangers, bearing seats, etc. Wencon is for this application supplied in four versions.

Wencon Cream, paste consistency, long pot life, heat resistance up to 80°C (152°F).

Wencon Rapid, paste consistency, high build, rapid curing, short pot life, heat resistance up to 80°C (152°F).

Wencon Coating. Fluid type, 0 - 0,5 mm (0-0,02 inch) build, pot life 20-40 min., heat resistance up to 80°C (152°F).

Wencon Hi-Temp. Fluid type, 0 - 1 mm (0-0,04 inch) build, pot life 20-40 min., heat resistance up to 300°C (570°F). Chemical resistant.

The technique is simple.

1. Clean flange A using a wheel grinder and the Wencon Cleaner. Clean flange B using only the cleaner.

2. Apply a thin film of Wencon Release Agent on flange B, and let it dry for ten minutes. Mix and apply a suitable amount of the product on flange A.

3. Put together the two flanges, and thereby squeeze out surplus material. After curing, which can be accelerated dramaticly with heat, the application is finished.

Read the instructions for use before applying.

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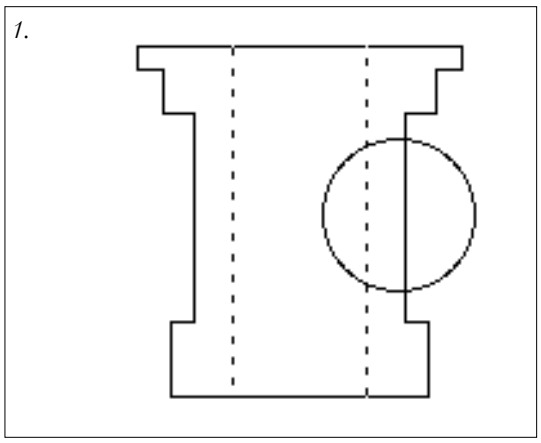
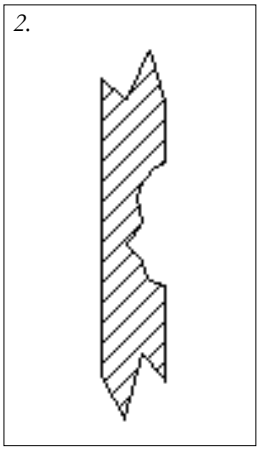
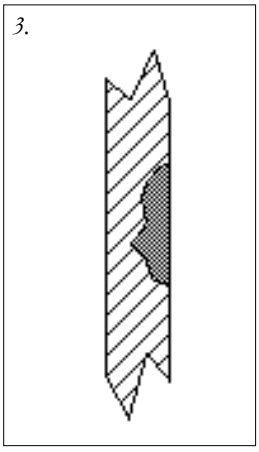
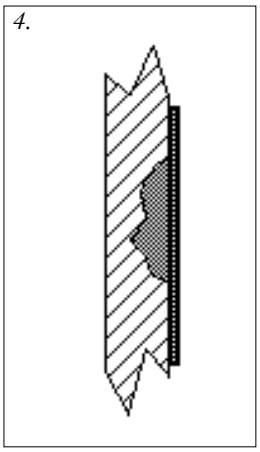
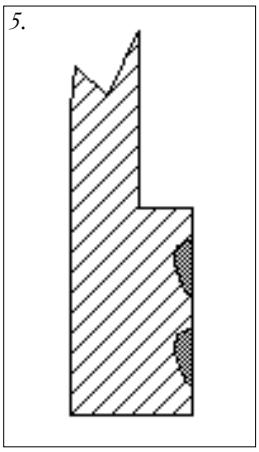
Repair of wet liners for diesel engine











In two instances, Wencon can provide a very good solution to the repair of wet liners for engines. Corrosion on the outside of the liner, and deterioration of the metal surface of the O-ring seats in either the top or the bottom.

1. Remove the liners from the engine, and protect the machined areas on the liner with tape.

2. Shot blast the affected areas to SA 2,5. (see further instructions in instructions for use).

3. Rebuild affected areas using either Wencon Cream or Rapid.

4. Coat the external surface of the liner, but avoid coating the machined surfaces, which shall mate the engine block.

The Wencon will prevent the liner from corroding again.

Usually, the sealing of the cooling water in an engine, is created by the means of O-rings.

The O-ring seats will be positioned in either the liner or in the engine block.

Both the O-ring seats and the sealing surface on the other part can corrode.

Either bi-metallically or by the continuos rubbing of the O-ring.

In both cases the damage can be repaired with Wencon.

5. Use the same procedure as above, but machine the surface after the curing has taken place. The machining can be done in either a lathe or by carefully grinding with a wheel grinder. If the damage is on the block, the initial surface preparation cannot be done by shot blasting, but by grinding and degreasing with Wencon Cleaner.

Follow the instructions carefully and ask your supplier if you are in doubt.

Experience has shown us clearly, that the treatment has no effect on the temperature of the cooling water.

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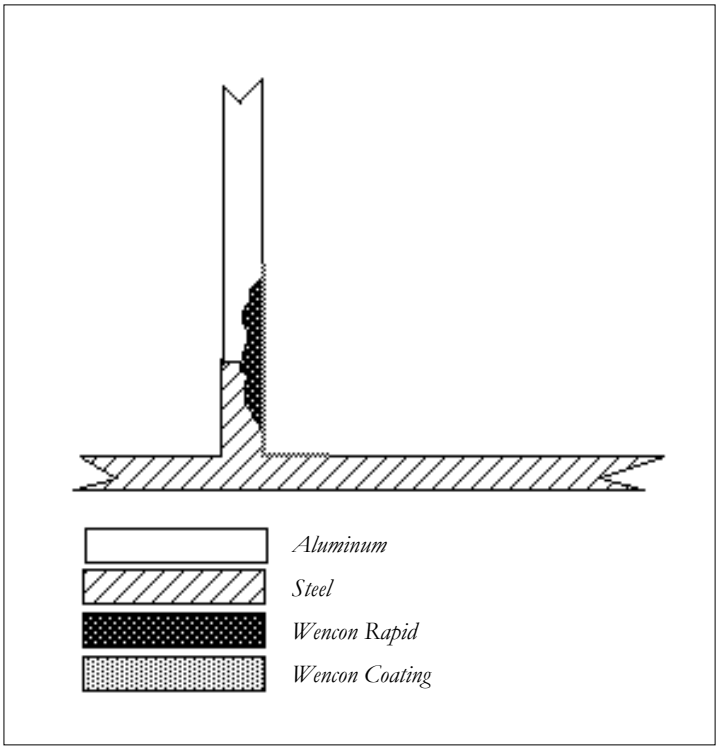
Repair of corrosion in aluminum wheel house



Corrosion in the area, where steel and aluminum meet, for instance as here on the wheel house on a fishing boat, is of bimetallic nature, and is very simple to repair (avoid) with Wencon.

1. Grit blast (SA 2 1/2) or grind the corroded area to bare metal.

2. If you grind, it is essential to degrease the surface with Wencon Cleaner.

3. Mix and apply a layer of Wencon Cream or Rapid to create an even surface.

4. After semi curing, while the first layer is still a bit tacky, apply the Wencon Coating, white on the whole area in question, and leave it again for semi curing. Apply the final layer, being the Wencon Coating, blue.

5. If the area is subjected to high temperatures or chemical attack, use the Wencon Hi-Temp in stead of the Wencon Coating.

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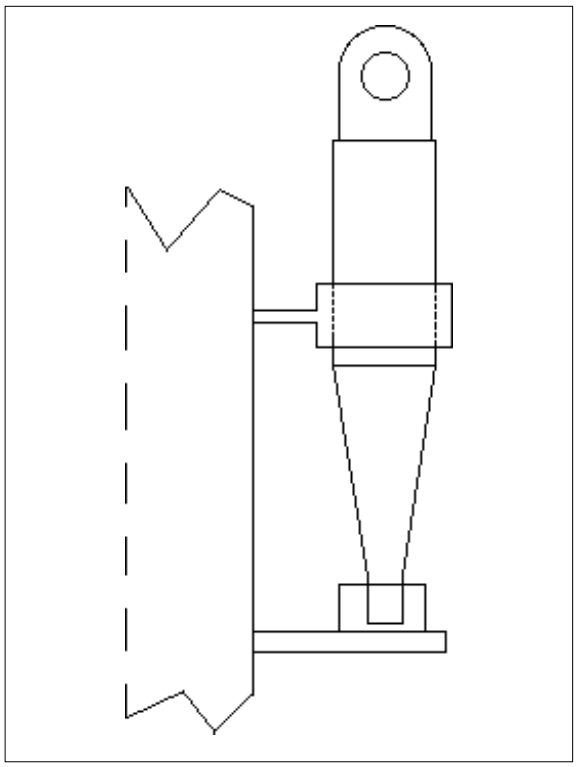
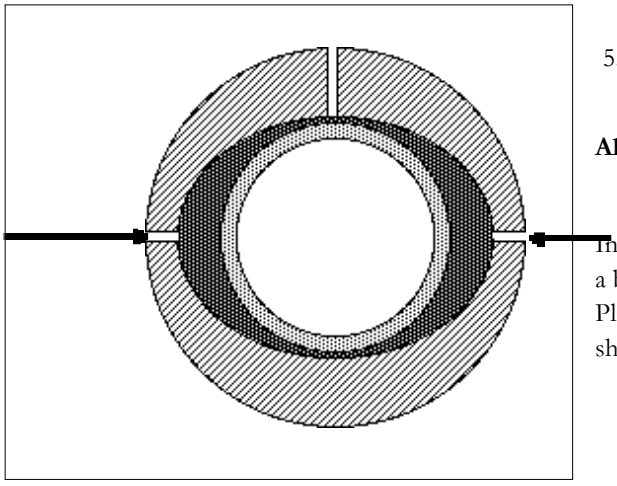
Repair of oversized heel pin for derrick





The traditional repair of oversized or oval needle bearings consists of welding and line boring.

This is a time consuming method, especially because of the line boring.

The job can easily be done by casting.

1. Machine a thin bushing, and create room for it by means of grinding or using a blow torch.

2. The internal surface in the bushing seat should be degreased with Wencon Cleaner.

3. Apply a thin coat of Wencon Release Agent on the outside of the bushing. This prevents adhesion to the bushing and eases future replacement of the bushing.

4. Mix and apply a suitable amount of Wencon Cream or Rapid on to both the mating surfaces.

5. Put the bearing in position, and center it by mounting the pin.

Alternative:

In some cases, the time factor makes you want to alter the method a bit. Mount the bushing without the Wencon material in between. Place it in position, and inject the Wencon through holes made as shown in fig. 2.

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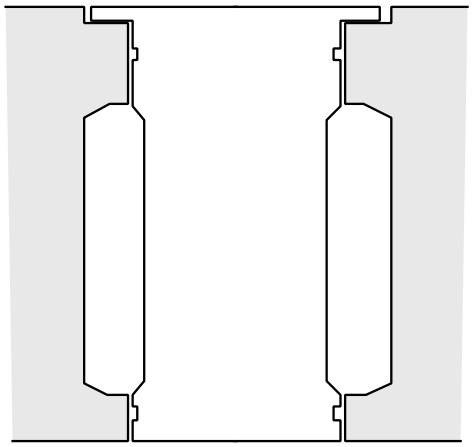
Repair of o-ring seats in engine blocks

1.



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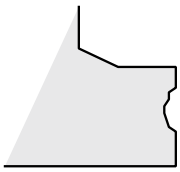

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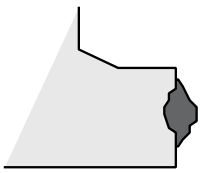

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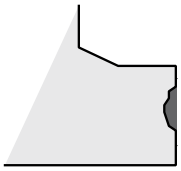

A typical example of a small damage having a substantial effect is the corroding of the surface that shall support an O-ring between the wet liner and the engine block.

In some engines, the O-ring seat are placed in the liner, in other engines in the block, but corrosion in the mating surface will always cause severe problems.

This technique is a good alternative to welding and machining being a very time consuming technique.

1. Remove the liner and clean the area.

2. Degrease thoroughly the corroded areas with Wencon Cleaner.

   Grind the corroded areas with wheel grinder or the like and leave a rough and metal clean surface.

   Heat the surfaces with hot air gun or the like to sweat out salt and oil and degrease again with Wencon Cleaner.

   If necessary, repeat this process.

3. Mix and apply a suitable amount of Wencon Rapid or Hi-Temp and leave the surface slightly proud.

4. Let the Wencon cure according to the instructions for use.

   Grind the surface to an even shape using a grinding tool made with the right shape. Wencon Putty is very convenient for making a grinding tool with the correct shape.

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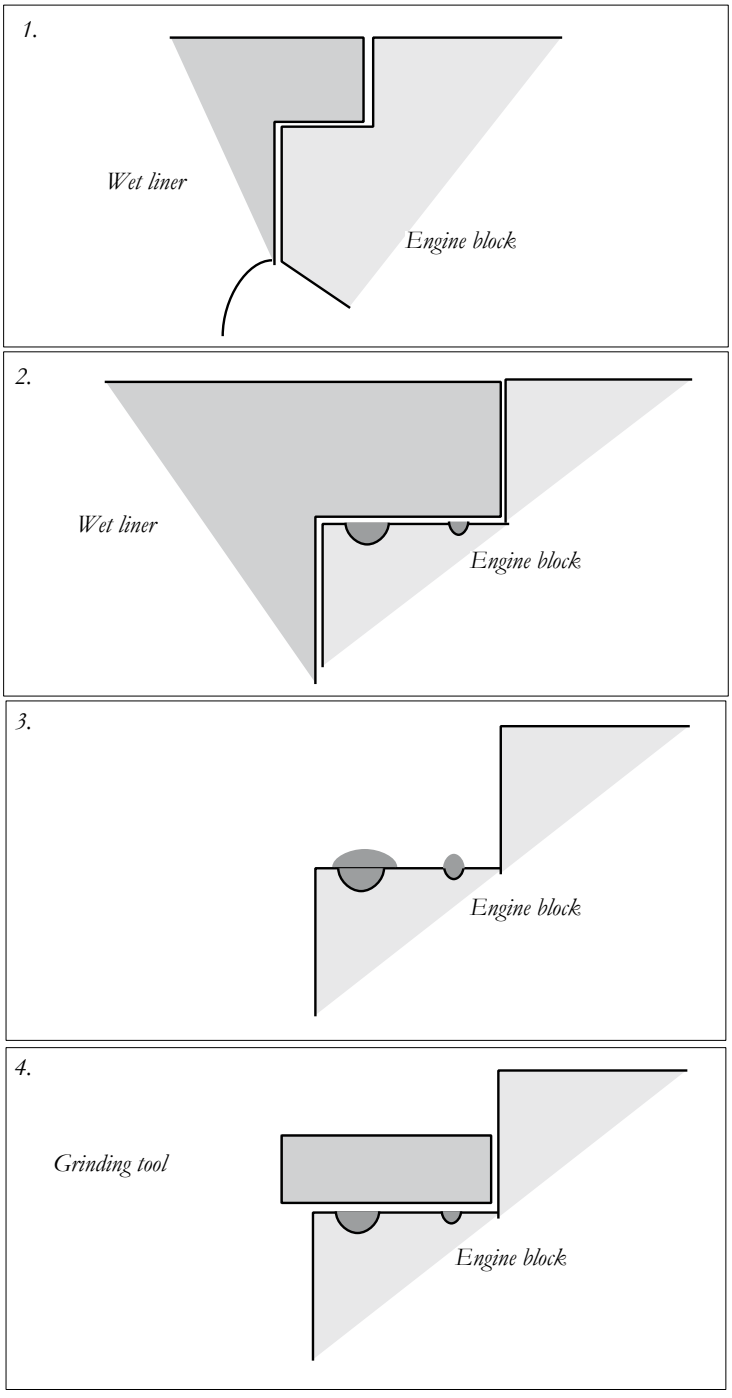
Repair of top land surface for wet liners



Problem:

Corrosion in top land surface for wet liners.

Purpose of application:

To prevent further corrosion in the pittings and to prevent leakage.

Solution:

1. Grind the pittings in the surface to bare metal using small rotating equipment.

2. Clean and degrease the surface with Wencon Cleaner.

3. Make sure the surface is clean and dry.

4. Mix and apply a suitable amount of Wencon Rapid or Hi-Temp to the affected areas, and leave the surface slightly proud, see ill. 3.

5. After curing, cut most of the excess material away with a knife, and grind the surface with appropriate grinding tool as in ill. 4.

   Neither sea water, nor oil will have damaging effect on the cured repair material.

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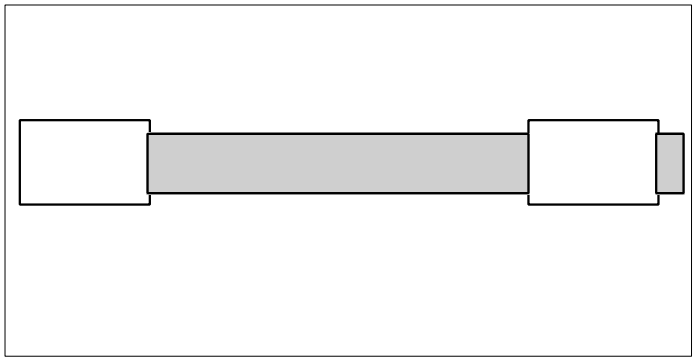
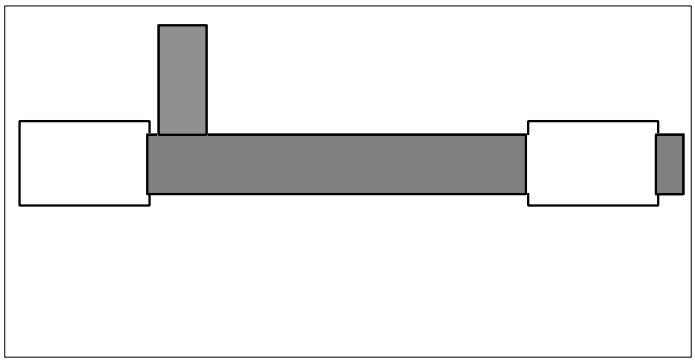
Coating of tail shaft and rudder stock





Wencon is often used for repair and/or protection of tail shafts and rudder stocks.

For new parts, leave out point 3. For corroded parts, start at point 1.

1. Grind or shot blast the surface to SA 2,5.

2. Degrease the surface using the Wencon Cleaner.

3. Mix and apply a suitable amount of Wencon Rapid to fill out the pits. Let it cure to a degree, where the surface is still a bit tacky.

4. Mix and apply the first layer of Wencon Coating, white in a thickness of 300 µ (0,3 mm) Use a flat angled brush having cut off half of the length of the bristles.

5. Wrap a layer of Wencon Reinforcement Tape tight around the shaft with an overlap of approx. 2 cm. Make sure, that some of the coating is pressed through the tape during the wrapping.

6. Leave it for curing for approx. one hour, and apply a layer of Wencon Coating, blue on the top to finish the application. Let it cure.

When handling the shaft, take care not to damage the coating.

If the shaft has been penetrated by salt water or oil, it is a good idea, prior to the shot blasting to heat the shaft to 30-40°C (102-136°F) in order to sweat out salt and oil.

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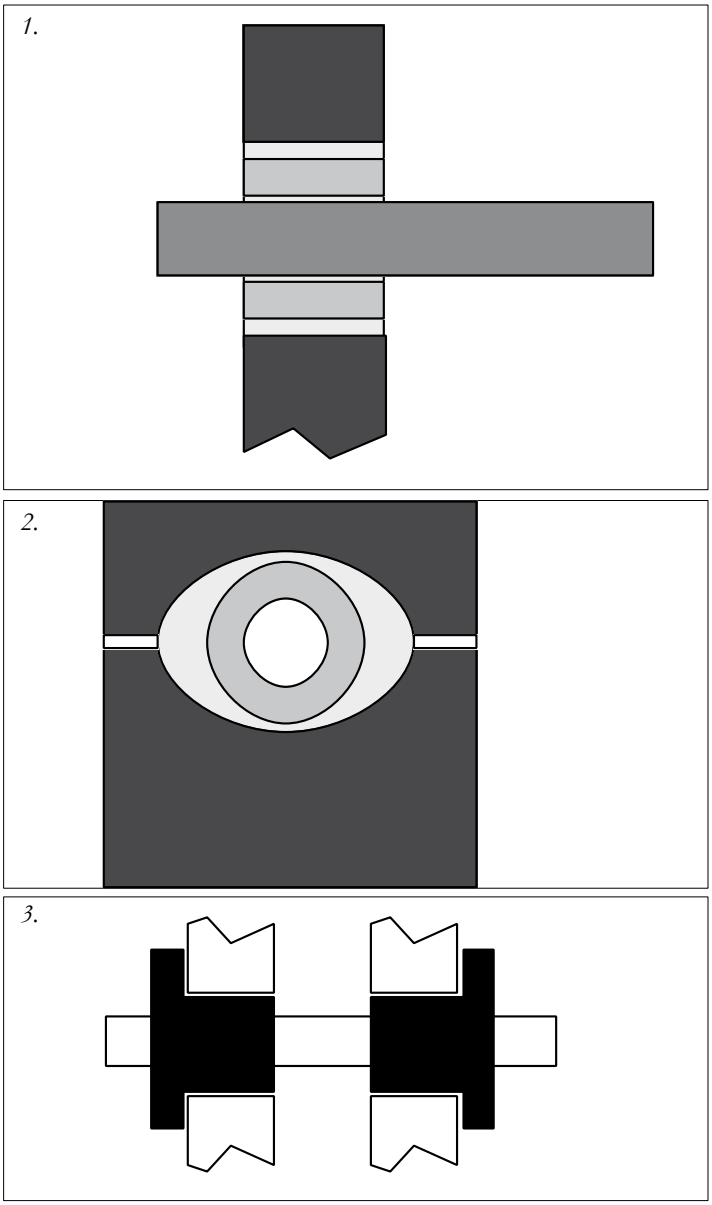
Casting of bushing seats



Casting of seats for bushings, bearings, etc. provide some advantages compared to more conventional techniques.

It is simple, it is quick and it does not require special equipment.

1. Remove the old bushing or bearing. Grind and clean the seat using Wencon Cleaner.

   To secure easy disassembly, apply a thin film of Wencon Release Agent on the bushing or bearing.

   Basically, there are two different ways of making the application, injecting the material after having mounted the bushing or by applying the material before the bushing is mounted.

2. & 3. Drill holes in the bushing seat as shown in ill. 3. Mount the bushing and hold it in position (typically by inserting the shaft).

Mix a suitable amount of Wencon Cream or Rapid and fill it into an empty cartridge for the injection gun (cartridges can be supplied by Wencon).

The gap between the seat and the bushing can easily be sealed with Wencon Putty.

In some cases it is more convenient to drill the holes in the bushing.

If the bushing is not available, the seat can be casted by the means of a casting tool made to the right measures. see ill 3.

The technique is as described above.

Less accurate is the technique, where you apply the Wencon Cream or Rapid to the surface of the bushing as well as into the seat.

Hereafter the bushing is inserted and the centration is then established by the means of the shaft or a tool made for it.

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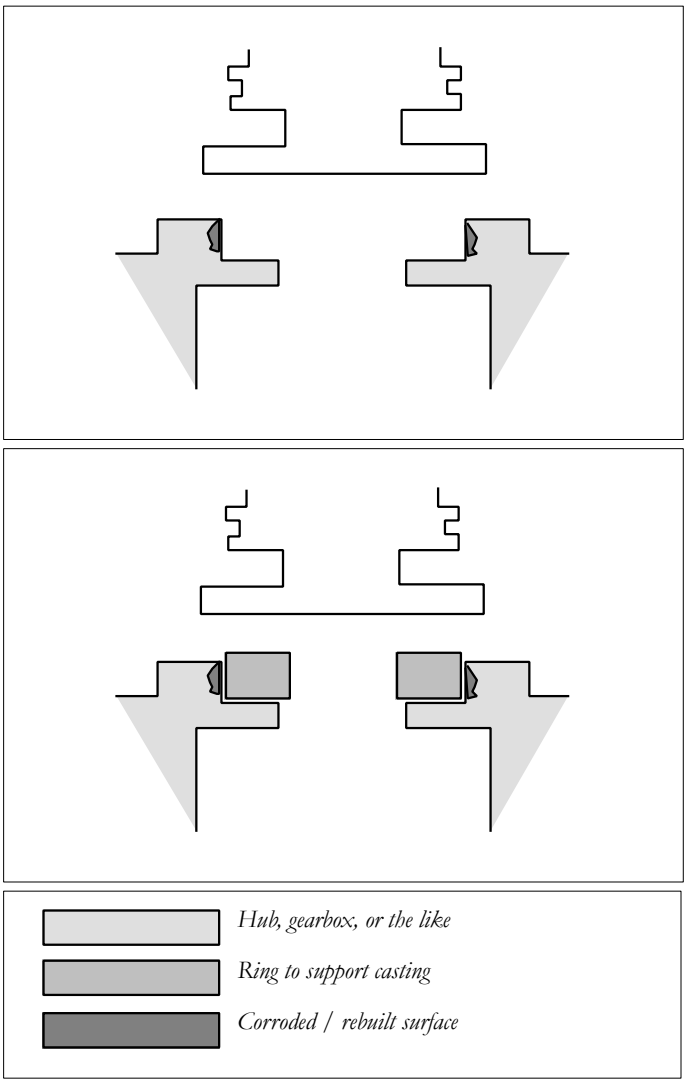
Repair of corroded sealing ring seats



Corroded sealing ring seats in gear boxes, ship`s hub in propeller head, etc., sometimes suffer from either bimetallic corrosion or erosion/corrosion due to leakage and fluid flow.

In situations, where the turning speed is big and rotation takes place constantly, there are good solutions with the Wencon system, if, and only if the cyclic contact does not happen between metal and the surface of Wencon material.

In situations, where the speed is low, and the rotation only appears every now and then (i.e. the rotation between propeller blades and the hub), the technique will work well, whether the rotating contact happens directly on the Wencon material or not.

The technique is quite simple:

1. Grind the attacked surface to clean metal. Clean the surface using Wencon Cleaner or similar cleaner/degreaser. Mix and apply a suitable layer of Wencon Cream or Rapid. After curing, grind or machine the surfaces to the required shape.

2. Alternative.

   To avoid the grinding or machining, make a ring to support the casting during the curing.

   If the ring is made of metal, apply a thin film of Wencon Release Agent before the casting.

   If the ring is made of PE plastic or the like, the release agent is not needed.

   If the ring is made to the right tolerances, the application will be finished after removing the ring after curing.

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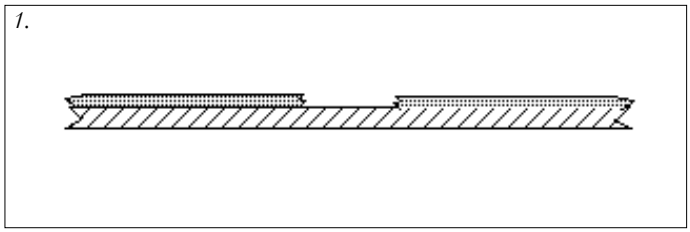
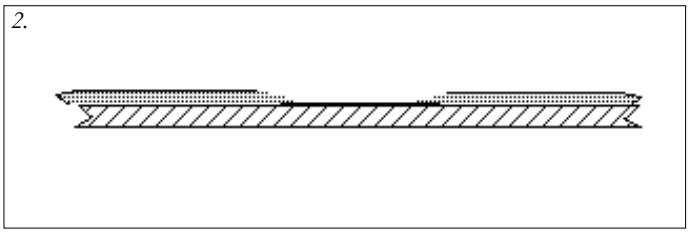
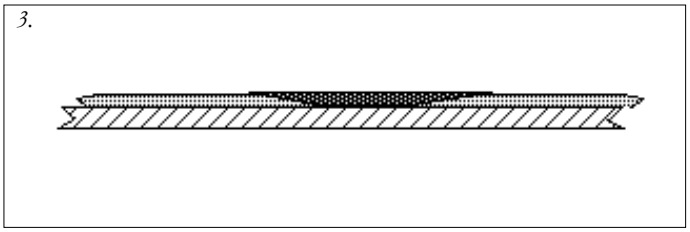
Repair of lining in inert gas systems







Lining of and/or repair of existing lining of inert gas systems can easily be solved with the Wencon Hi-Temp.

In many cases, such lining consist of multilayer polyester systems, which are rather difficult and time consuming to repair. Further more, the polyester systems must be inforced with glass flake material for longer penetration time.

Most of these systems require priming, which again prolonges the process.

Wencon Hi-Temp offers a quick and easy solution for this application, and the product has an excellent adhesion to polyester and epoxide systems.

1. Clean the area with steam or hot water removing acid and salts etc.

2. Prepare the surface to clean metal by the means of shot blasting, grinding or needle gunning. (se chapter 4 in the Wencon Manual). Prepare the edges for an overlap. Finish the preparation with Wencon Cleaner.

3. Mix and apply a suitable amount of Wencon Hi-Temp, yellow. Let it cure for 1-2 hours, and finish the repair with a final coat of Wencon Hi-Temp, green.

Curing:

The curing is possible under temperatures ranging from +10°C to +150°C (34-510°F). At high temperatures, the Wencon Hi-Temp becomes more fluid, so the repair may require more than two layers to build up the normal thickness 0,6 - 1,0 mm (0,02-0,04 inch).

Coverage:

One unit of each color, yellow and green will cover 0,7 - 1,0 sqm. For repair of small damages in existing lining, the coverage will be reduced.

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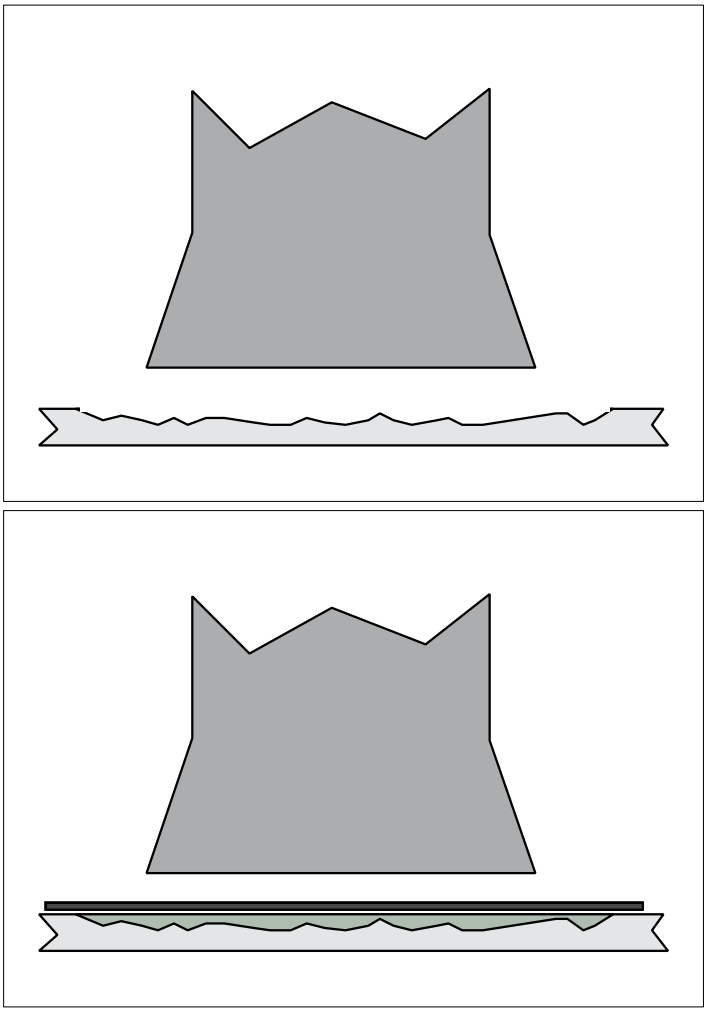
Repair of corrosion in ballast tanks



Any steel construction near the inlet of a pump suffers often from erosion/corrosion and impingement. For instance in a ballast tank.

If the deterioration has reached a point, where the thickness of steel plates critically small, doublers should be welded in before this treatment.

1. Clean the area around the inlets. Heat the plates to approx. 40°C (136°F) to sweat out salt. Shot blast the area to SA 2,5. (see Wencon Manual, chapter 4, Surface preparation for further instructions).

2. Mix and apply a suitable amount of Wencon Cream or Rapid to rebuild the damaged area. Let it cure until the surface is stiff but still slightly tacky.

3. Mix and apply Wencon Coating, white sing brush or spatula, see instructions for use. Let it cure for approx. one hour.

   Apply the final coat of Wencon Coating, blue and after curing the Application is completed.

If a general tank coating shall be applied on top of the repaired area, it is advisable to grind the cured, glossy surface for better adhesion. Alternatively, if the tank coating is epoxy based, it can be applied shortly after the final coating and make an excellent adhesion.

Alternative - wet surface

If the repair has to take place during normal traffic, it will be difficult to dry the surface before applying. In this case it is very convenient to use Wencon UW Cream and Wencon UW Coating, which give a good adheseon on a wet surface.

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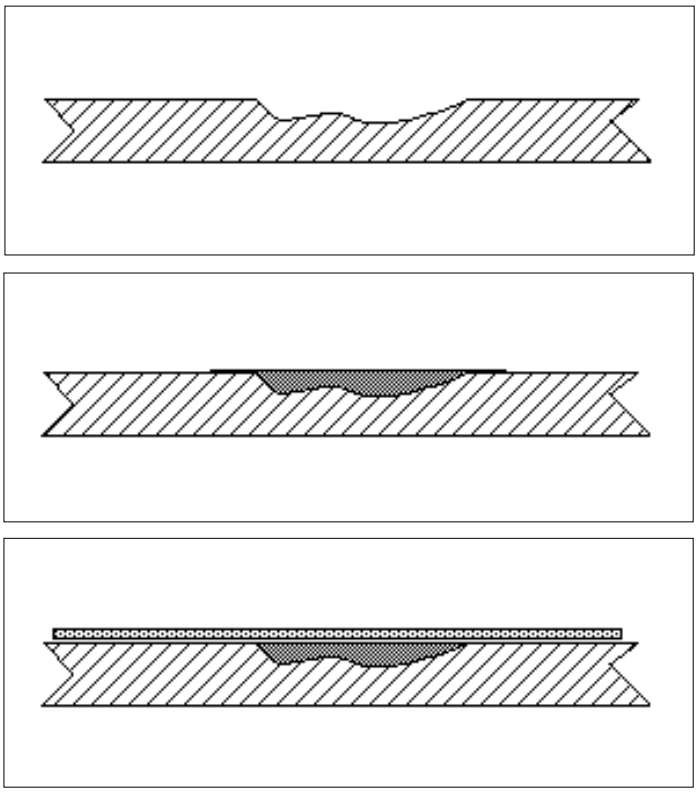
Repair of pittings in tanks



Steel

Wencon Cream or Rapid

Wencon Coating or other tank coating

Pittings in tanks can very easily be repaired using Wencon.

Whether the tank is coated or not, the pittings shall be pretreated as described in the surface preparation data sheets.

1. After surface treatment, mix and apply a suitable amount of Wencon Cream or Rapid (use Rapid for quick curing and/or deep pittings on vertical surfaces).

   Make sure the material gets in good physical contact with the substrate.

2a. Coating with Wencon Coating.

   After 1-2 hours curing, apply first layer of Wencon Coating, White, and after yet another hour (while the white coating is still a bit tacky) apply the final coat of Wencon Coating, blue.

2b. Coating with other brands of tank coating.

   Apply first layer of any well known tank coating before the Wencon Cream or Rapid has fully cured, to ensure a first class adhesion.

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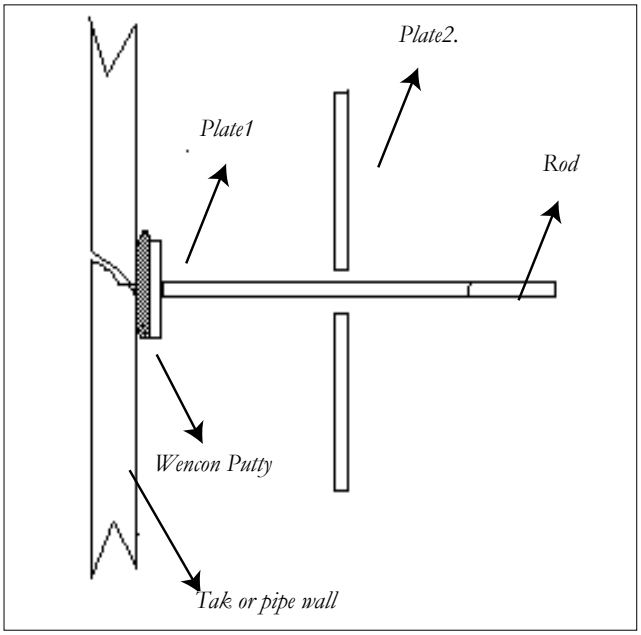
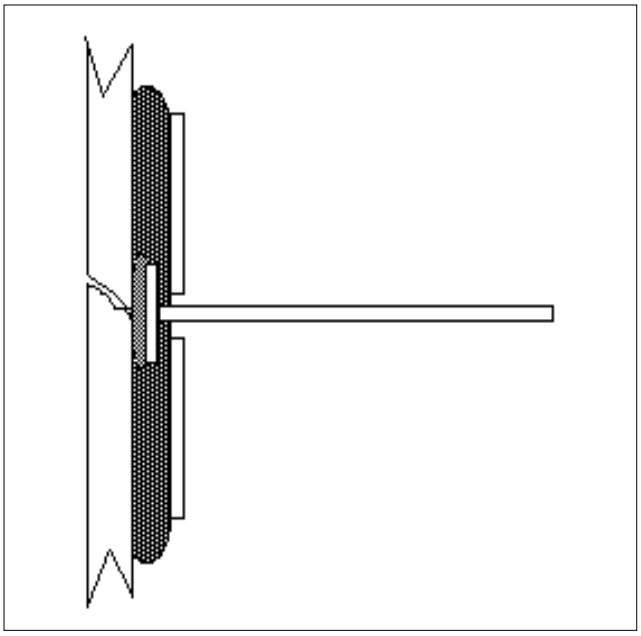
Emergency repair of cracks





Cracks in tanks, pipes and other structures, involving a leakage of fluid, can very easily be repaired using Wencon.

If possible, reduce or eliminate pump pressure during application.

The technique involves two steps. First, the leak must be stopped, thereafter, it must be secured.

1. Prepare three tools.

One small steel plate (Plate 1.) big enough to cover the leak, and larger than the hole in the large plate (see below).

One larger steel plate (Plate 2.) to cover an area of 100 x 100 mm or larger. The size has influence on the strength of the repair. In the middle of this plate, drill a hole for the rod (see below). Grind the surface facing the repair area to a rough profile and clean it using the Wencon Cleaner.

One rod (could be a large screwdriver), long and rigId enough to serve its purpose (see below)

2. Stop the leak.

Mix a suitable amount of Wencon Putty and place it directly in the leak. If pressure is high, await semi curing, that will make the Putty more stiff. Before the Putty cures, press and hold it by the means of the small plate, and fixated it with the rod. This will stop the leak.

As an alternative a wooden plug can be hamered into the leak to take the most of the pressure.

3. Secure the leak.

Grind an area around the leak, slightly larger than the large steel plate. Clean it using the Wencon Cleaner.

Mix and apply a thick layer of Wencon Rapid to the surface. Make sure that the thickness exceeds the combined thickness of the Putty and the small steel plate. Mount the large steel plate into the uncured Wencon Rapid, and hold until full cure.

Variation.

On applications where the crack is not on a flat surface, the plates will have to be shaped accordingly.

For quick cure, apply heat up to 100°C (340°F).

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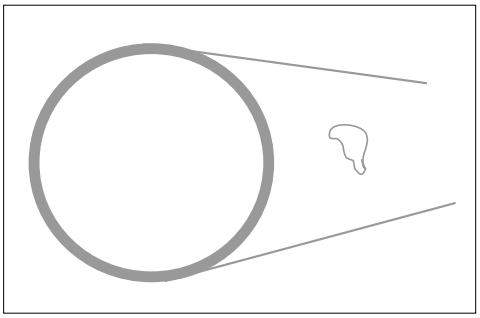
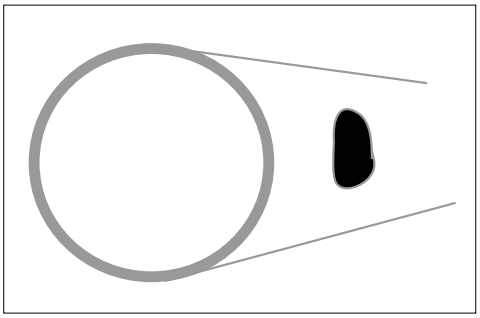
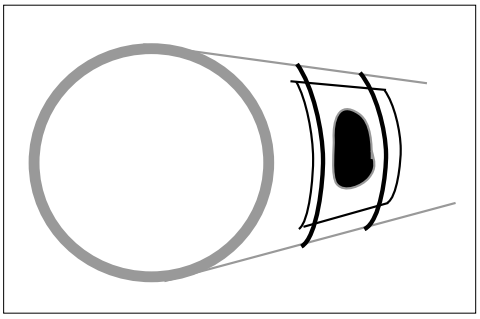
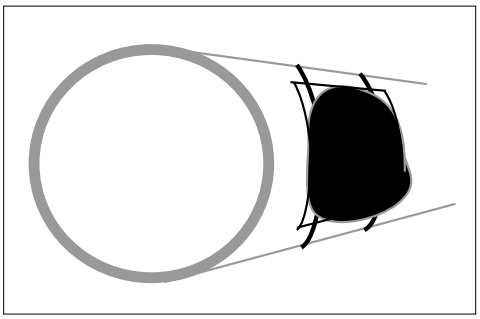
Emergency repair of leaks in exhaust systems









Cracks or leaks in exhaust systems can only be repaired by using a product with a very high temperature resistance.

Wencon Exhaust System Repair Compound is a one component product, with a temperature resistance of 1300°C (2400°F). That will cover by far the most systems. Follow these simple guidelines.

1. Grind and clean/degrease the affected area and the surrounding area. Use Wencon Cleaner.

2. Open one of the tubs containing the product (remember this is a one component). Stir it to an even consistency. Apply a suitable amount in and around the leak.

3. Cut a suitable piece of the metal mesh and fix it to the repair area using steel band or steel wires.

4. Apply second layer of the compound and leave it for initial curing for 3-4 hours, depending on temperature and humidity.

   When the compound has turned hard, heat it up slowly to approx. 95°C (200°F) and leave it at that temp. for 15 minutes to fully cure.

Remarks

It is important to note, that this product is designed for emergency repairs of leaks. It is not designed as for instance an internal lining for turbo charger housings.

Read the MSDS (chapter 3) before using the product.

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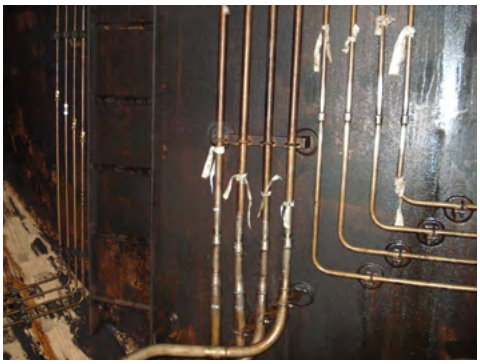
Pipe repair - heating coils



Heating-coils often leak in the welding sleeve joints, due to the use of improper welding material. Heavily pitted pipesurfaces are often seen in the bottom area, and they are normally caused by the combination of bad steel – aggressive media- and high surface temperature.

Both types of leakage are easily repaired by use of Wencon Hi-Temp Coating and Reinforcement Tape.

Following procedure can be used:

1. Return pipes are dismounted and the pipes are drained for water, and blown through with compressed air, to ensure a dry surface
2. Clean the area around the leak
3. Roughen up the surface using either emery cloth (grit 60) or Perago-disc.
4. Degrease with Wencon Cleaner
5. Apply one layer of Wencon Hi-Temp Coating with a brush (half the bristles cut away, so it is more stiff)
6. Wrap Wencon Reinforcement Tape with a 50% overlap into the wet Coating, ensuring that the coating is penetrating the tape.
7. Apply a new layer of Wencon Hi-Temp, and a new layer of Reinforcement Tape, and follow the same procedure until you have at least 3 layers of Reinforcement Tape and 4 layers of Wencon Hi-Temp coating.
8. Let it cure for at least 8-10 hours before use.

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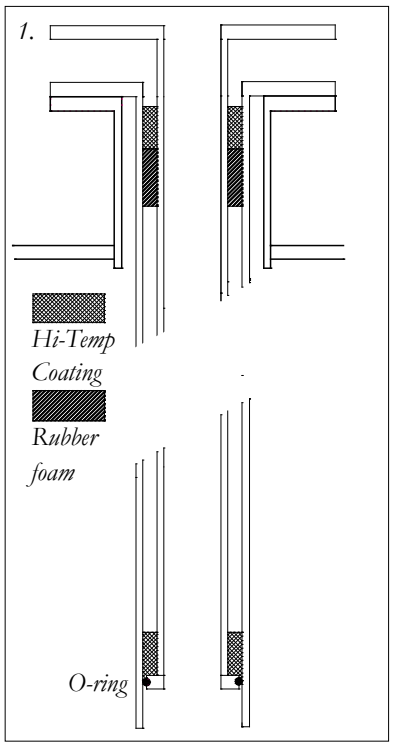
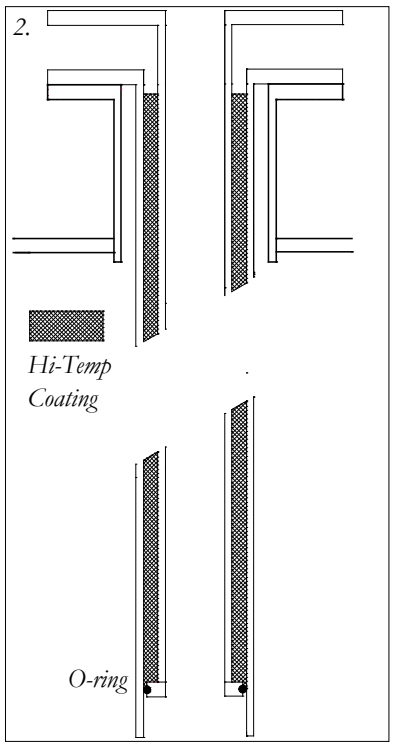
Pipe repair - heating coils, thermal oil pipes

Heating Coils often corrode in the upper tank area, approximately ½ -1 meter (20-40 inch) beneath the tank top.

This area is normally very difficult to reach, and demands the use of scaffolding from inside the tank.

Below you find an alternative method of repairing this kind of damage from the deck-side. The repair method is simple, you cast an insert pipe into the original pipe by injecting Wencon Hi Temp, which also helps to delay the Bi – Metallic corrosion. The insert pipe off course will reduce the flow in the heating medium, so it has to be considered how much this will effect the heating capacity.





An insert pipe is prepared, 2-3 cm (0,8-1,2 inch)smaller in outer diameter than the inner diameter of the original pipe, and in a length about 20 cm (8 inch) beneath the damaged area. In the bottom of the insert pipe there has to be a groove for an O-ring, to seal for the later injected Wencon Hi Temp Coating. You can make the insert pipe with a flange in the top or without. You only have to be sure that the insert pipe will not fall down in the original pipe during the curing process.

If you find large holes in the original pipes, you have to use method 1, if no leaks we suggest you use method 2.

Method 1

1. Slide in the insert pipe. If you choose a flange in the top on the insert pipe, leave approximately 10-15 cm (4-6 inch) free for injecting.
2. Mix Wencon Hi-Temp Coating and fill it in a standard cartridge for a "sealant-gun".
3. By means of a thin-walled steel- or plastic pipe mounted on the gun, a layer of 5 cm Coating is injected in the bottom area between the two pipes.
4. Remove the filling-pipe, and push in a layer of approximately 5 cm (2 inch) of rubber-foam to form a seal between the two pipes, and force it down 5-10 cm (2-4 inch) under the flange surface.
5. Fill the remaining gap between the two pipes with Wencon Hi-Temp. If the insert pipe has a flange, use Wencon Hi Temp coating as a sealing compound between the old and the new flange.
6. Let the coating cure for 8-10 hours.

   (The rubber-foam is used, to prevent coating leaking into the tank-area through holes in the damaged surface)

Method 2

1. Slide in the insert pipe into the original pipe.
2. Mix Wencon Hi-Temp Coating and fill it in a standard cartridge for a "sealant-gun".
3. By means of a thin-walled steel- or plastic pipe mounted on the gun, fill up the gap between the two pipes.
4. Let the coating cure for 8-10 hours.

   In principle it is possible to use this form of repair-procedure, even for full tanks, as there will be no contact between the repair material and the cargo. There is also no explosion-hazard, as no heat or sparks are made during repair.

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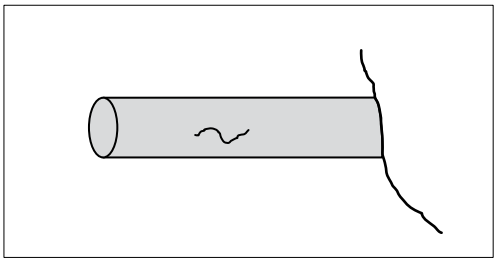
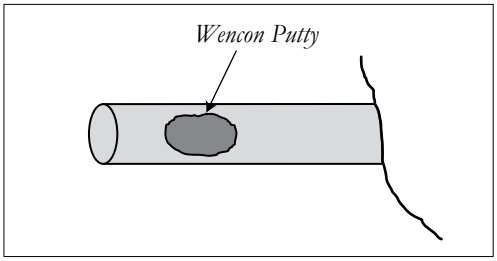
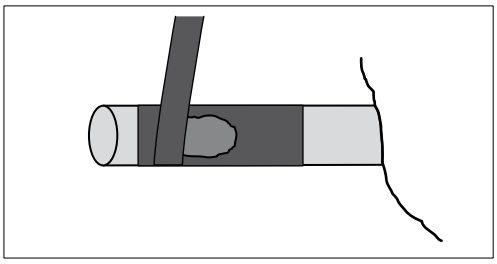
Pipe repair - cargo pipe







On all pipe repairs you have to consider - temperature and pressure during operation. This will help you to choose the right Wencon product and the right Wencon product and the right application datasheet.

In general for normal temperatures use Wencon Cream or Rapid. If you want a top coat use Wencon blue/white coating. For high temperature pipes use Wencon Hi-Temp, which can take temperature up to 160°C (320°F) in corrosive conditions and up to 300°C (570°F) used as a filler. If the surface is wet (ballast pipes) use Wencon UW Cream and Wencon UW Coating as the top coat. Wencon UW Cream and Wencon UW Coating will have a good adhesion on a wet surface - even under water.

1. If possible drain the pipe. Clean and dry the repair area and determine the size of the leak.
2. With an angle grinder, a Perago dish or coarse emery cloth, grind a belt around the pipe over an area 10-15 cm (4-6 inch) wider than the leak. Clean the repair spot thoroughly with Wencon Cleaner.
3. If liquid is still coming out of the leak, mix and apply a suitable amount of Wencon Putty directly into the crack, to stop the leak. Clean again with Wencon Cleaner.
4. Mix an adequate amount of Wencon Cream or Rapid.
5. Apply the first layer of Wencon Cream or Rapid, using a brush or a spatula. (0,3-0,5 mm / 0.01-0.02 inch)
6. Wrap the Wencon Reinforcement Tape tight around the pipe with 50% overlap. Make sure the Reinforcement Tape is fully impregnated with Wencon.
7. Again apply a layer of Wencon, and repeat until you have 3 layers of Wencon Reinforcement Tape and 4 layers of Wencon HiTemp.
8. For repairs that shall last for a longer period, we recommend to apply extra 2 layers of Wencon Coating after same method.

Curing time can be speeded up by heating up - Halogen lamps or like.

To see the theoretical consumption of Wencon material and Wencon Reinforcement Tape, see Chapter 1 in the Wencon Repair Manual.

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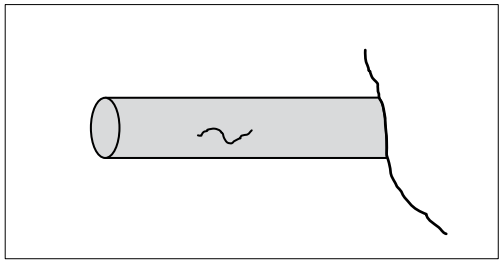
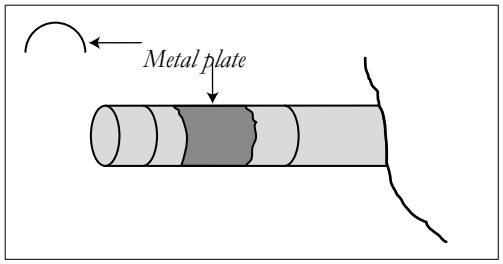
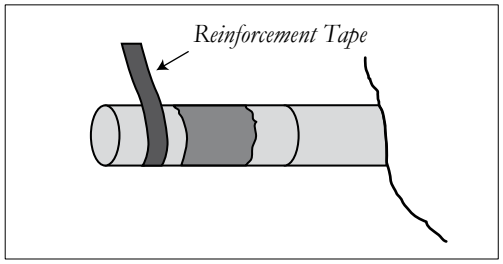
Pipe repair - ballast pipes







On all pipe repairs you have to consider - temperature and pressure during operation. This will help you to choose the right Wencon product and the right Wencon product and the right application datasheet.

In general for normal temperatures use Wencon Cream or Rapid. If you want a top coat use Wencon blue/white coating. For high temperature pipes use Wencon Hi-Temp, which can take temperature up to 160°C (320°F) in corrosive conditions and up to 300°C (570°F) used as a filler. If the surface is wet (ballast pipes) use Wencon UW Cream and Wencon UW Coating as the top coat. Wencon UW Cream and Wencon UW Coating will have a good adhesion on a wet surface - even under water.

1. If possible drain the pipe. Clean and dry the repair area and determine the size of the leak.
2. With an angle grinder, a Perago dish or coarse emery cloth, grind a belt around the pipe over an area of 10-15 cm (4-6 inch) wider than the leak. Clean the repair spot thoroughly with Wencon Cleaner.
3. If liquid is still coming out of the leak, mix and apply a suitable amount of Wencon Putty directly into the crack, to stop the leak.
4. Clean again with Wencon Cleaner.
5. Apply the first layer of Wencon UW Cream, using a brush or a spatula. (0,3-0,5 mm / 0.01-0.02 inch)
6. Cover the leak with a metal plate bended in the same shape as the pipe using Wencon UW Cream as a glue. The metal plate has to be blasted / grinded and cleaned on both sides.
7. Again apply a layer of Wencon, and repeat until you have 3 layers of Wencon Reinforcement Tape and 4 layers of Wencon UW Cream.
8. For repairs that shall last for a longer period, we recommend to apply extra 2 layers of Wencon UW Cream after same method.

Curing time can be speeded up by heating up - Halogen lamps or like.

To see the theoretical consumption of Wencon material and Wencon Reinforcement Tape, see Chapter 1 in the Wencon Repair Manual.

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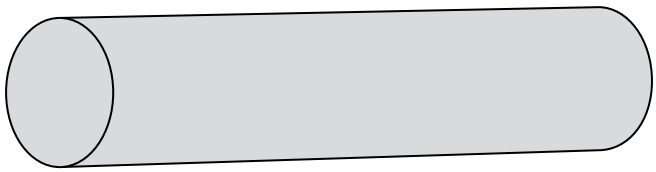
Pipe repair - high pressure pipe

1



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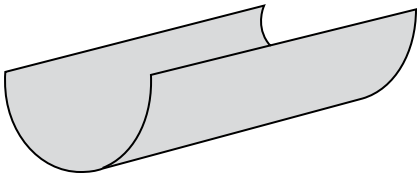

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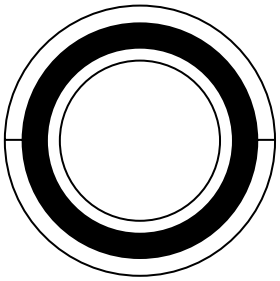

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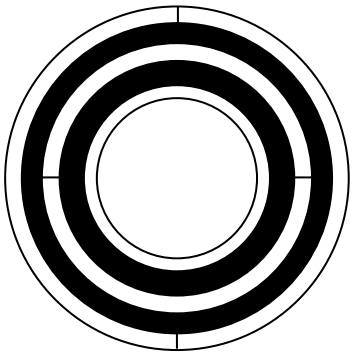

Repair of pipes with high pressure shall always be considered carefully. National regulations shall be respected, and the safety of people shall always be in the forefront.

The most safe way of repairing a pipe is by using a prime quality repair compound in a combination with additional pieces of pipe. That provides the highest degree of safety.

1. Empty the pipe, if possible. If not, depressurize it. Grind and clean the repair area.
2. Prepare two pipe shells, as shown in ill. 2 allowing a gap of 3-10 mm (0,12-0,4 inch) between the external surface of the existing pipe and the internal surface of the pipe shells. The streght / thickness of the pipe shells shall be chosen according to pressure. Grind and clean the internal surfaces of the shells.
3. Mix and apply Wencon Cream or Rapid to the prepared areas and mount the shells as shown in ill. 3. Hold the shells in position by the use of pipe clamps or the like.
4. For further reinforcement, you can apply yet another set of pipe shells as shown in ill. 4.

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Pipe repair - cable pipes

Wencon Pipe Tape is a very quick and easy way of repairing cable pipes.

Wencon Pipe Tape is a fiber reinforcement tape impregnated with a polyurethan resin. It is activated by water and shall be wrapped tight around the pipe as shown below.

Wencon Pipe Tape can be painted with all types of ships paint and will look nice and last long.

1. Clean the pipe and grind it with emery paper or the like.

2. Unpack the Wencon Pipe Tape and submerge it in water for 30-40 seconds.

3. Wrap the Wencon Pipe Tape tight around the pipe. (min. 9 circles)

4. Dip the gloves in water and smoothen the surface with your hands.

5. After 2 minutes the products semi cures, and after 15 minutes it is fully cured (@ 20°C (68°F).

Wencon Pipe Tape Usage Chart

Pipe Diameter	Pipe Circ.	9xCirc.	Pipe Tape	Pipe Tape
mm	mm	mm	5 x 150 cm	5 x 350 cm
15	47	423	One	
20	63	567	One	
25	79	707	One	
32	101	905	One	
40	126	1131	One	
50	157	1414	One	
80	251	2262	Two	One
100	314	2828	Two	One
125	393	3535		One
150	471	4242		Two
200	628	5656		Two
250	786	7070		Two
300	943	8483		Three

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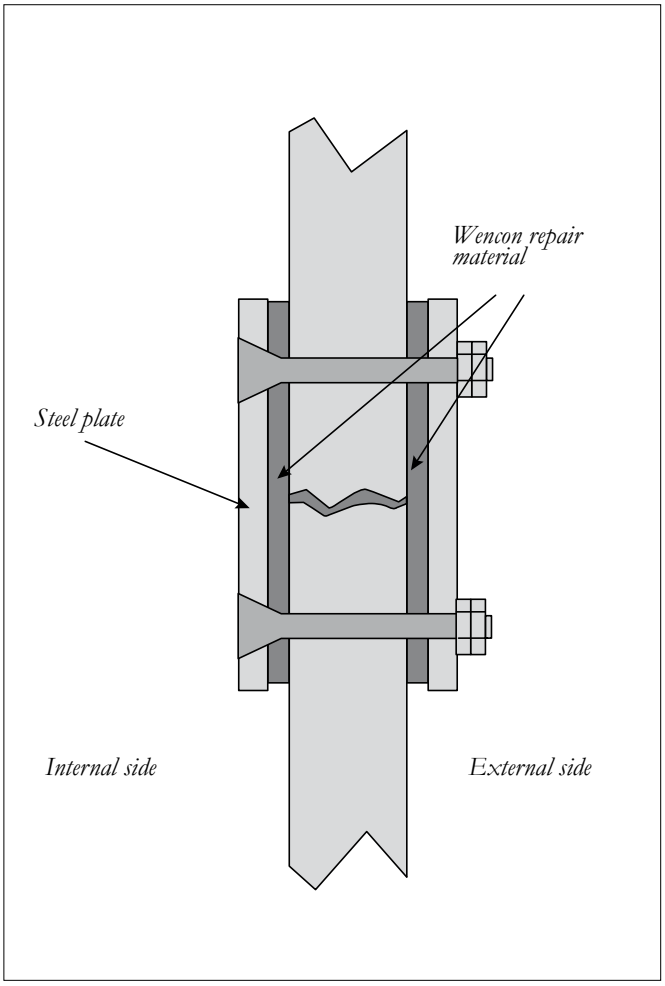
Sealing cracks in turbo charger casings



Remarks

This application is meant to seal a well stabilised crack. Do not expect the application will work if the crack still moves.

Stabilise the crack

Find the ends, stop the crack and stabilise it as described by suppliers of crack repairs, or hire experts to do so.

Seal the crack

1. Clean the entire area internally as well as externally with Wencon Cleaner. Grind the area to clean metal and degrease thoruoughly several times.

Inside job

2. Make two pieces of metal plate, approx. 100 mm (4 inch) wide and 50-100 mm (2-4 inch) longer than the crack. The plates shall cover the repair area.
3. Form it in the shape of the crack. Use welding, bending or the like.
4. Drill holes as shown in the plates.
5. Clean the area again. Also the metal plate.
6. Mix and apply a layer of Wencon Hi-Temp directly in the crack in a thickness of min. 5 mm (0,2 inch) as shown in the ill.
7. Before curing, place the prepared metal plates over the crack and make sure to get good contact. Remove excess material.
8. After semi cure the work with extra securing of the plate can start. Drill and tap holes in the engine block as shown, and mount bolts as shown. Secure the bolts with an anaerrobic adhesive, bolt wires or the like.

Remarks

There is always a risk when you mount loose parts in a turbo charger. Calculate the risk in your situation and act accordingly.

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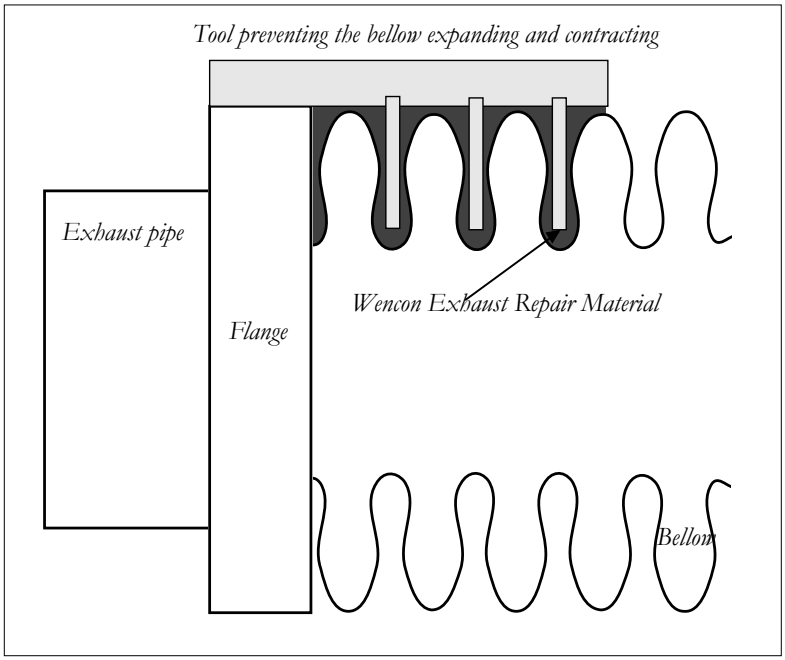
Bellow repair



This is one way of trying to overcome the mentioned problem. In a situation like this, you can do nothing else but try to do your best.

1. Prepare pieces of iron that shall prevent the bellow to move in the area in which they are inserted.

2. Prepare one or more pieces of iron, onto which you weld the pieces mentioned in 1., in order to hold them in position.

3. Apply the Wencon Exhaust Repair material into the grooves of the bellow.

4. Before it cures, put your tool as mentioned above into the wet material and weld it to the flange or the like, depending on how it looks.

5. Let the Exhaust Repair material cure as long time as you can give it. If it is not allowed to cure enough, the gas will leak again.

Importent:

Only meant for emergency, until a new bellow can be mounted.

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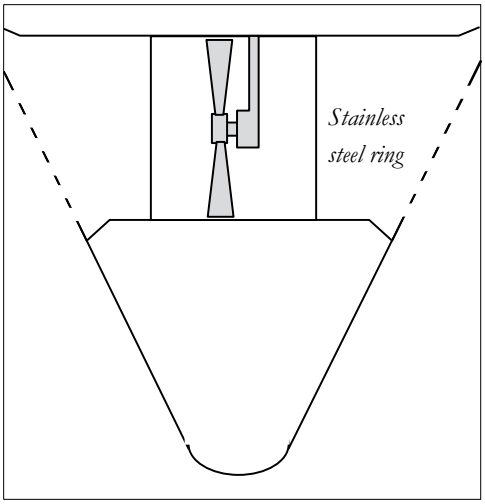
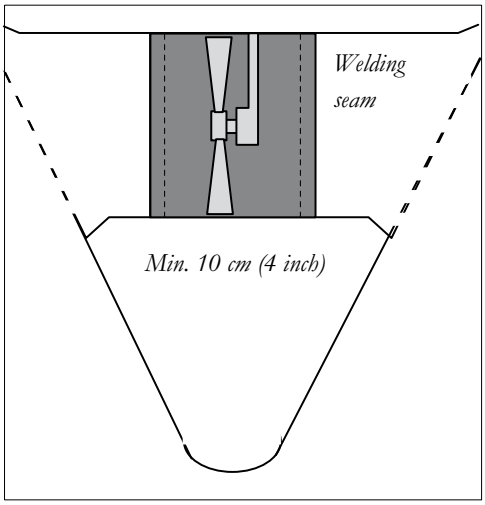
Bow thruster tunnel





Wencon

Often we see that the Bow thruster tunnel is suffering a lot from bi-metallic corrosion. The reason is a mix of many different metals in the area - mild steel, stainless steel ring, bronze head / propeller etc.

The area is easy to repair and to protect against comming bi-metallic corrosion, by rebuilding the pittings with Wencon Rapid, and coating with Wencon Coating.

1. Blast the area to SA 2½. All the attacked area has to be blasted - at least to 10 cm on each side of the welding seams for the stainless steel ring.
2. Sweat out salt and water using hot air or a flame.
3. Blast again.
4. Clean the area with Wencon Cleaner.
5. Mix and apply the first layer of Wencon Coating white, while the Rapid is tacky, and let it cure.
6. Mix and apply the second layer of Wencon Coating blue, while the first layer is still tacky and let it cure.
7. The tunnel can be painted with normal ships paint here after to have an even colour.

Som times we see that the Bow Thruster Head also is suffering from bi-metallic corrosion. This can be repaired using the same methode.

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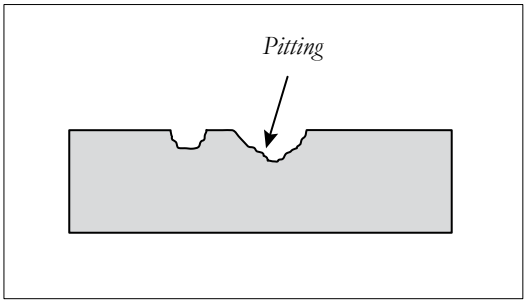
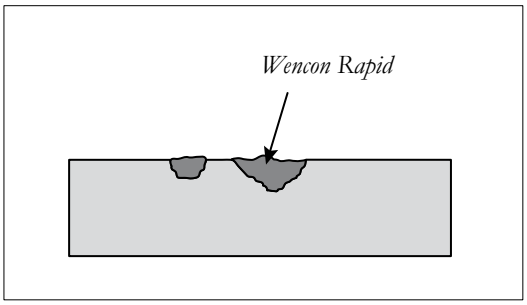
Hatch covers - repair of corroded sealing surface





Hatch covers are exposed a lot to corrosion on the sealing surfaces, and corroded areas can easily be repaired with Wencon.

This repair is easy to do and will last for a long time on areas where there is not hard wear. This means that on areas where you find a lot of wear, the repair will last shorter.

1. Clean the area where you have the corrosion. Blasting to SA 2½ will be the best, bur you can also use a Perago dish or an angle grinder. Most important is that the surface is rought and clean.
2. Heat up the cleaned surface with hot air or a flame to sweat out salt and water.
3. Blast or grind again.
4. Clean with Wencon Cleaner.
5. Mix and apply Wencon Rapid, by using a spatula. Be sure that you fill up all pittings.
6. Let it cure.
7. After curing grind the area using emersy paper to an even surface.
8. If all pittings are not filled up, repeat 4-7.

It is possible to paint on top of the Wencon Rapid after the repair.

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Index - Chapter 6

FOUNDED 1862

CERTIFICATE NUMBER
05-LD483521-1-PDA

DATE
29 August 2012

ABS TECHNICAL OFFICE
London Engineering Department

CERTIFICATE OF DESIGN ASSESSMENT

This is to Certify that a representative of this Bureau did, at the request of

WENCON PLASTIC STEEL - BOGENSE

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

PRODUCT: **Synthetic Repair Compounds & Resins**

MODEL: **See Attachment**

This Product Design Assessment (PDA) Certificate 05-LD483521-1-PDA, dated 29/Aug/2012 remains valid until 28/Aug/2017 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

AMERICAN BUREAU OF SHIPPING

Xiaonan Niu
Engineer

WENCON PLASTIC STEEL
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P.O. BOX 74
BOGENSE
DK-5400
Denmark
Telephone: 45-648-11010
Fax: 45-648-13039
Email: wencon@wencon.dk

Product: **Synthetic Repair Compounds & Resins**

Model: **See Attachment**

Intended Service:
1) Repair of and/or protection against deterioration of metals in pumps, valves, filters, pipes, heating coils, tanks, bulk heads, coolers, rudder stocks, propeller shafts, etc.;
2) For creating fixture and preventing future corrosion in the seats for rudder stock bushings, rudder heel bushings, rudder cone assemblies, rudder pintle bushings, rudder pintle cones, stern tubes, and the like.

Description:
Wencon Repair and Protection System

Ratings:
Product ratings are included in Attachment. Product application procedures as per manufacturer's recommendations see Wencon Manual "Repair of deteriorated machine parts" (latest edition available at www.wencon.com).

Service Restrictions:
Unit Certification is not required for this product. If the manufacturer or purchaser requests an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

Comments:
1) Repair procedures including surface preparation and application are to be carried out in accordance with the manufacturer's specifications and procedures.
2) Replacing metal that is essential for the structural strength of the item the Surveyor is to be contacted prior to commencing repair, in order to obtain the Surveyor's acceptance for the specific application.
3) Repairs to pressure containing systems the Surveyor is to be contacted prior to commencing repair, in order to obtain the Surveyor's acceptance for the specific application.
4) The following limitations apply to the repair of pressure containing systems using Wencon Pipe Tape:
a) Maximum temperature 120 Deg C.
b) Maximum pressure when used with Wencon Putty 50bar.
c) Maximum pressure when used without Wencon Putty 10bar.
d) The use of these products is not permitted on any pressure part in containing a toxic or flammable liquid or gas.

Notes / Drawings / Documentation:
Wencon Manual "Repair of deteriorated machine parts"

Term of Validity:
This Product Design Assessment (PDA) Certificate 05-LD483521-1-PDA, dated 29/Aug/2012 remains valid until 28/Aug/2017 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

STANDARDS

ABS Rules:
2012 Steel Vessel Rules 1-1-4/7 and 1-1-A2

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Fax: 45-648-13039
Email: wencon@wencon.dk

2012 Steel Vessel Rules 1-1-4/7 and 1-1-A3

National:
NA

International:
NA

Government Authority:
NA

EUMED:
NA

Others:
Manufacturer's Standards

MARINE DIVISION

Certificate number: 03892/E0 BV
File number: ACM 171/2301/001
Product code: 0015H

This certificate is not valid when presented without the full attached schedule composed of 7 sections

www.veristar.com

TYPE APPROVAL CERTIFICATE

This certificate is issued to

WENCON ApS (SUPPLIER)

Bogense - DENMARK

for the type of product

SURFACE PROTECTION AND COLD REPAIR PRODUCTS

BASIC PRODUCTS : WENCON CREAM, RAPID, COATING, HI-TEMP, PUTTY, PIPE TAPE, EXHAUST REPAIR
UNIQUE PRODUCTS : WENCON UW CREAM, UW COATING, UW PUTTY, CERAMIC CREAM, CERAMIC COATING

Requirements:
BUREAU VERITAS Rules for the Classification of Steel Ships,
BUREAU VERITAS Rules for Offshore Units.

This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 09 Jan 2019

For BUREAU VERITAS,

At BV FREDERICIA, on 09 Jan 2014,

Jesper Jensen

BUREAU VERITAS SURVEYORS AT PARIS 1828 FREDERICIA INTERNATIONAL REGISTER

Achilles JQS
empowered by Achilles

Joint Qualification System

for suppliers to the Oil Industry in Norway and Denmark

Certificate of Qualification

Awarded to

WENCON APS

Company Reg.no: DK16648086

Achilles Id. 28195

Achilles Information Centre hereby confirms that
WENCON APS
is qualified in the Achilles Joint Qualification System
for suppliers to the Oil Industry in Norway and Denmark.
The qualification concerns the product and service
categories listed in the appendix.

aibel · AkerSolutions · bayerngas norge · BG NORGE · bp · centrica energi · Chevron · ConocoPhillips · DETNORSKE · DONG energy · EDISON · ENERGINET.DK · eni norge · e·on Ruhrgas · ExxonMobil · Faroe Petroleum · GASSCO · GDF SUEZ · HALLIBURTON · HESS · Idemitsu Petroleum Norge · Lundin · MAERSK OIL · MARATHON · NORECO · OMV · PA RESOURCES · petoro · PremierOil · REPSOL · ROCKSOURCE · RWE The energy to lead · Schlumberger · Statoil · SUNCOR ENERGY · TALISMAN ENERGY · TOTAL · TULLOW OIL · VNG Norge · wintershall BASF Group

Oddvar Gjomle
Achilles Information Centre
Managing Director

Anja Thorsdalen
Achilles Information Centre
Operation Manager

Issued Date:
6-Nov-2013

Expiry Date:
11-Dec-2014

The participating Oil Companies and Main Contractors may use Achilles JQS as the basis for preparation of bidder lists directly or together with additional qualification criteria established by the individual Company. Other qualification stages may be added by the individual Company if more information is found necessary to complete the preparation of bidder lists