

## Casting Rudder Trunk bushing.

<b>Application:</b>	Bushing cast to fit
<b>Place:</b>	Fredericia, Denmark
<b>Date:</b>	July 2009
<b>Job and report done by:</b>	FA Yard staff
<b>Wencon products used:</b>	Rapid, Coating, Putty, Cleaner, appl. tools



1. & 2.

Due to bi-metallic corrosion in the rudder trunk, surface is damaged and bushing is loosened.



3. To make a decent surface preparation, a Perago disc is used to make the surface in the trunk as rough as possible.



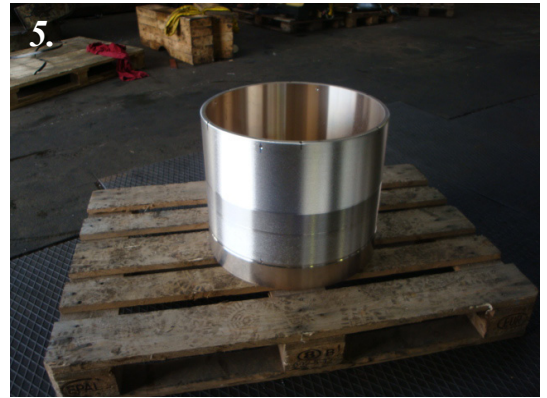
4. In order to get a good adhesion the area is cleaned twice with Wencon Cleaner.



5. & 6.

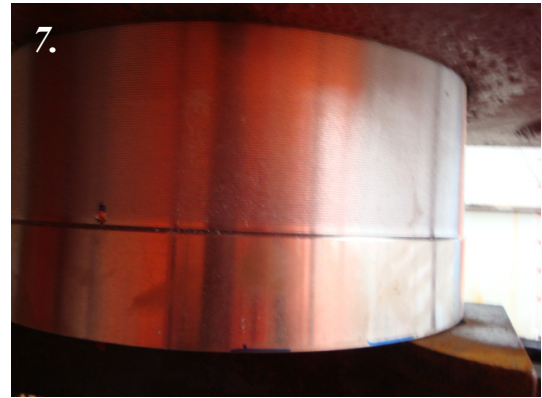
A new bushing is made at the yard. Threaded holes are made in the top to be able to adjust the bushing during the alignment. At the bottom, the bushing is machined to 0,5 mm less than the original size of the outer diameter. To pump in the Wencon Coating it is necessary to have a gab of min. 2,5 mm, therefore the bushing is trapped at the outside surface. Holes to inject the Wencon Coating are made just above the trap.

Note that the outside surface is machined very rough to get maximum adhesion.





7. Before the bushing is pulled to position, it is cleaned with Wencon Cleaner.



8. After cleaning, a suitable amount of Wencon Coating is applied at the lower part of the trap.



9. & 10.  
Bushing in position, ready to do the alignment.



11. & 12.

Alignment done by the Yard. Job done by using the threaded holes and the bolts applied with Wencon Release Agent, in order to remove the bolts after curing at the final job.



13. Injection hole close up



14. Injection cartridges prepared and ready for use.



15. & 16.

After Wencon Rapid is cured, Wencon Coating is mixed and filled in the cartridges and injected from the bottom of the bushing. Done by using the 4 injection holes in order to avoid "air pockets" while casting.



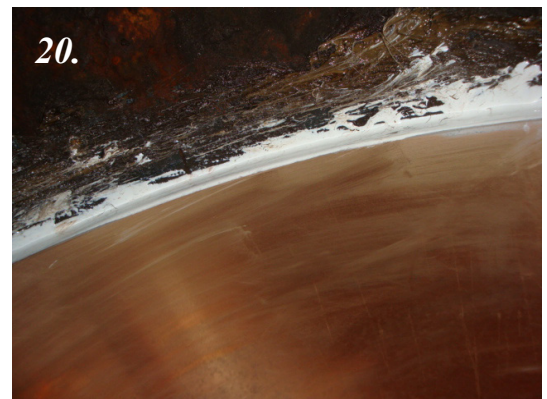
17. & 18.

To make sure gap is 100% full, it is important that there is a gap at the top of the bushing. This is to show when casting is complete.





19. & 20.  
Bushing from top after injection.



21. After curing, the bolts are removed from the alignment and injection holes.



22. Wencon putty is applied in order to fill the injection holes.



**Choose the relevant surface preparation, according to the nature of the job. Seek advice from a Wencon Technician if needed.**

## **Specification for surface preparation for Dry Applications**

Defined as applications, where the Wencon product will be applied to a surface at a temperature minimum 3 degrees above dew point. Use the Wencon Products: Wencon Cream, Wencon Rapid, Wencon Coating, Wencon Ceramic Cream, Wencon Ceramic Coating, Wencon Hi-Temp, all requiring a dry surface.

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.
5. Always use Wencon Cleaner prior to application.

## **Specification for surface preparation for Wet/Damp Applications**

Defined as applications, where the Wencon product will be applied to a surface at a temperature less than 3 degrees above dew point. Use the products Wencon UW Putty, Wencon UW Cream and Wencon UW Coating for applications on wet or damp surfaces.

1. Water jet the entire surface with water and sand to a standard equal to SA 2½, as described above.

## **Specification for surface preparation for Emergency/Temporary Applications**

### **Perago Treatment**

Perago is a rubber disk with hard steel spikes mounted on the periphery. 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 at all Wencon Distributors.

### **Grinding**

Wheel grinding is often an acceptable surface preparation for emergency applications, where shot blasting is not possible. When grinding use a coarse stone or flap. 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. Often the grinding will not hit the dents.

### **Needle Gunning**

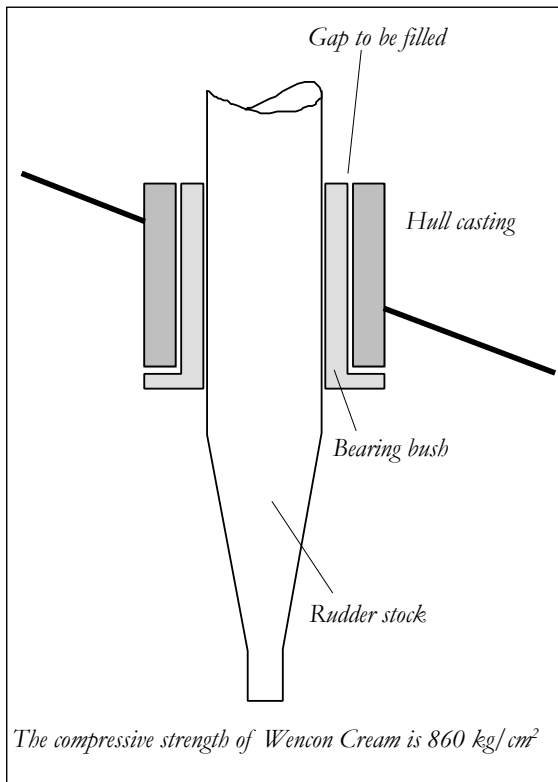
Needle gunning is a method that has almost been forgotten in recent years. Or should we say is mostly used for very rough cleaning or removal of rust. It is possible to do a very nice job using a needle gun, but it takes time and should be closely supervised. It is essential that the marks from the sharp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

### **Wire Brushing**

Wire brushing can be a good way of removing scales, rust and old paint. However, you will need to grind the surfaces after the wirebrushing to make the surface as rough as possible.



## Casting of seat for rudder stock bearing



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.