

# Rothemühle Air Heater Bearings

## TECHNICAL SERVICE BULLETIN

### Purpose

This Technical Service Bulletin advises owners and operators of the need to periodically inspect the main shaft bearings on Rothemühle air heaters for any evidence of deterioration or damage and to take immediate action to replace any deteriorated bearings.

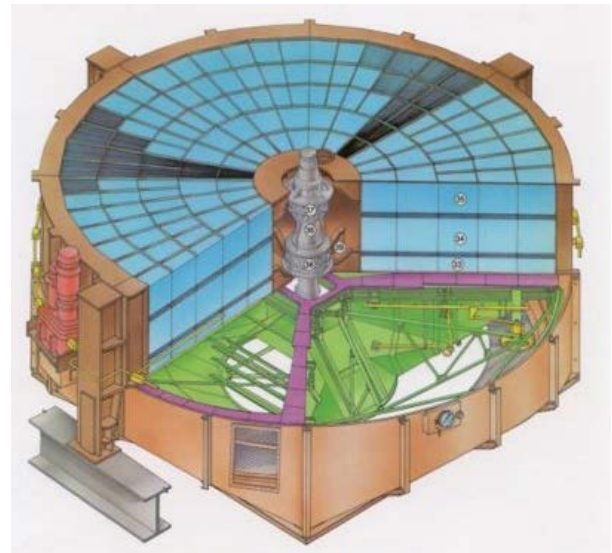
### Background

Babcock & Wilcox (B&W) furnished Rothemühle air heaters on new boiler equipment starting in the early 1970s after becoming a licensee to market this equipment in the United States. Many power plants have regenerative-type air heaters such as a Rothemühle air heater because of its compact arrangement compared to other designs. Many of these units are still in operation today and other than routine maintenance during planned outages, the equipment has operated reliably.

This equipment has heat collecting surfaces that exchange heat between the hotter exiting boiler gases and cooler incoming combustion air to capture the low-grade heat exiting the boiler to preheat combustion air. The operation of the air heater and boiler depends on reliable operation of the air heater's rotating parts which are supported and aligned through thrust and radial bearings. These bearings are lubricated continually through an oil pumping system that monitors and controls the oil temperature and filters solid particles suspended in the oil.

### Problem

A few air heaters have experienced bearing failures after decades of successful operation.



Investigation into the cause of failed bearings have identified two primary failure mechanisms:

- 1. Insufficient grounding during maintenance**  
When maintenance is performed and welding on the upper or lower rotating hood is necessary, these hoods are not independently grounded. Without sufficient grounding, the electrical current from welding will pass through the bearings and may damage the polished bearing surfaces.
- 2. Insufficient lubrication of the bearings**  
For bearings on slow rotating equipment, oil viscosity is a very important factor. B&W currently recommends Mobil SHC 634 oil because of its high viscosity within the operating temperatures of the bearings and flowability. If other lubricating oils have been substituted in the past or are currently used that were not specified in the operating instructions, the bearings may begin to wear and will eventually fail.

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## Recommendation

Always be sure to independently ground the air heater hoods and pinrack if any welding is required. At least two points of independent grounding is recommended. Caution signs and permanent grounding cables should be located at all access doors to provide a reminder to maintenance personnel to always ground the hoods and pinrack. Daily tool box meetings should stress the importance of independent grounding.

If the air heater lubricating oil has been switched from Mobil SHC 634 or as specified in the operating instructions, the oil should be replaced with the recommended oil. The oil return line screens and oil reservoir should be checked periodically for any metal fragments that would indicate a deteriorating bearing condition. As a minimum, it is recommended that owners adopt a quarterly lube oil sampling and routine oil analysis program. Oil samples should be taken from the trombone trap area of the oil return piping on the lubrication oil skid.



Owners should adopt a periodic inspection of the air heater bearings during planned outages. Access to conduct a detailed inspection, after partial disassembly of the bearing housings is limited, so only parts of the bearings are viewable. If owners have concern, replace the bearings and inspect the old bearings in a shop or laboratory to see if they are adequate as spares. The continually loaded thrust bearing is expected to be the bearing that would initially fail.

During operation, remove the air heater from service if there is a significant increase in drive motor amps for an extended time. A sudden increase in motor amps is usually a sign of a deteriorating bearing issue.

## Support

Contact B&W Field Engineering Services through your local district service office for assistance with your air heater bearing investigation and inspection efforts or if you have any questions.

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