PRODUCT INFORMATION

EASECAST® – SUPERIOR PROPERTIES

CORROSION BEHAVIOUR

During the development of EASECAST®, the focus was placed on creating lead-free alternative materials which have the same high-quality application properties as the standard alloys containing lead. Here, corrosion resistance was of course taken into account. This characterises bronzes and gunmetals in particular. As part of Rheinmetall AG, the aim of KS Gleitlager GmbH was to enable processors and users as easy a transition to lead-free copper materials as possible. A lack of corrosion resistance would block this path.

When implementing specific products and processes with the alternative lead-free EASECAST® materials, KS Gleitlager GmbH is available at all times as a reliable and skilled development partner. In consultation with various users and plant operators, a widely used gearbox oil, as well as salt water/seawater were used as testing media during development of the materials. In the results of these exposure tests, the lead-free EASECAST® materials demonstrate across the board corrosion behaviour that is at least equivalent to the standard materials containing lead – and sometimes even better.

EC7 – THE ALTERNATIVE TO RG7 (CC493K)

Under the influence of gearbox oil, the standard material Rg7 (CC493K) containing lead displayed a corrosion depth of approx. 1.5 µm (Fig. 1) at an oil temperature of 130 °C over 168 hours, whilst for the comparable samples of the lead-free alternative material EC7 only corrosion depths up to 0.6 µm were determined (Fig. 2).

The superior corrosion resistance of EC7 is demonstrated even more clearly in contact with salt water/seawater. Here, the corrosive attack could be reduced from approx. 7.3 µm (Fig. 3) to around 0.7 µm (Fig. 4) compared to Rg7 (CC493K) which contains lead.

EC12 – THE ALTERNATIVE TO GBZ12 (CC483K)

Exposure tests with gearbox oil demonstrated very good corrosion behaviour both with the standard material Gbz12 (CC483K) containing lead (Fig. 5) and with the lead-free alternative EC12 (Fig. 6). It should be noted, however, that the corrosion layer of the standard material Gbz12 (CC483K) containing lead partially became detached in contrast to the lead-free alternative material EC12.

In salt water, however, the tendency to corrode is much more pronounced, as shown in Fig. 7 and Fig. 8. Whilst the corrosion depth of the standard material Gbz12 (CC483K) containing lead was approx. 13.5 µm, it was possible to reduce the corrosion depth by a factor of almost 10 for the lead-free material EC12.

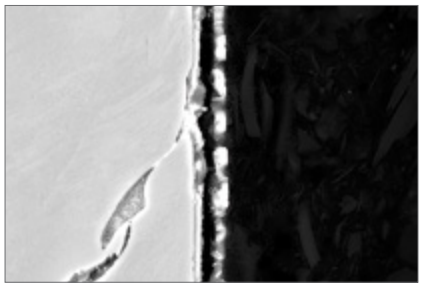

Fig. 1: Corrosion behaviour of Rg7 (CC493K) in gearbox oil at 130 °C after 168 hours

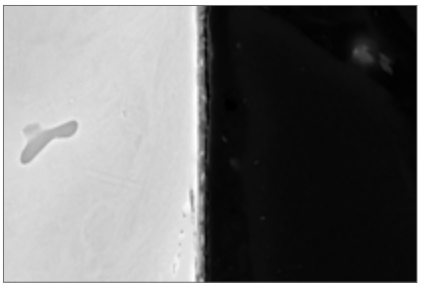

Fig. 2: Corrosion behaviour of EC7 in gearbox oil at 130 °C after 168 hours

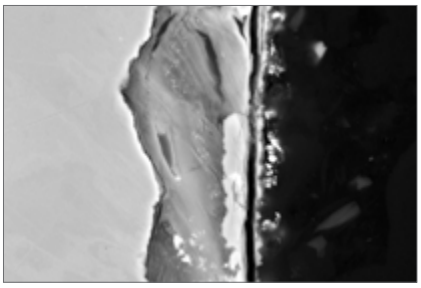

Fig. 3: Corrosion behaviour of Rg7 (CC493K) in salt water at room temperature over 168 hours

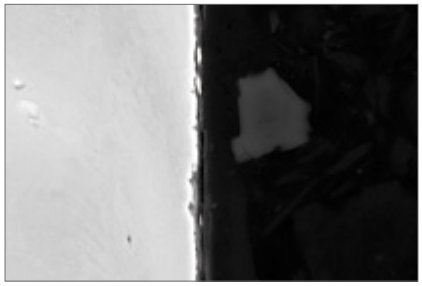

Fig. 4: Corrosion behaviour of EC7 in salt water at room temperature over 168 hours

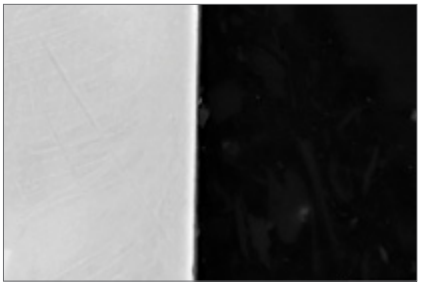

Fig. 5: Corrosion behaviour of Gbz12 (CC483K) in gearbox oil at 130 °C after 168 hours

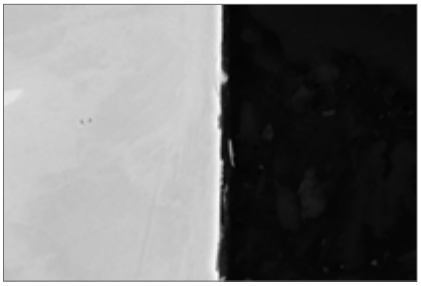

Fig. 6: Corrosion behaviour of EC12 in gearbox oil at 130 °C after 168 hours

Fig. 7: Corrosion behaviour of Gbz12 (CC483K) in salt water at room temperature over 168 hours

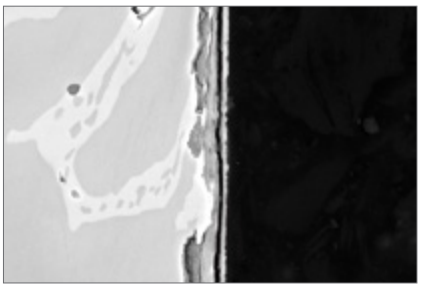

Fig. 8: Corrosion behaviour of EC12 in salt water at room temperature over 168 hours