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Press Release

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New Loctite Fixmaster Marine Chocking foundation for steam engines

Epoxy resin from Henkel supports propulsion system of historic coastal steamer “Prinz Heinrich”

Jonny and Hinni each weigh somewhere in the region of two and a half metric tons. Despite their considerable age of more than 100 years, the two will soon be in a position to once again show exactly what they can do. The aged steam engines develop around 200 horsepower and, from this fall, will once more be powering the restored coastal steamer “Prinz Heinrich” as it returns to its erstwhile service, taking passengers to the North Sea islands.

Just scrap? Belongs in a museum? No way! Some 44 years after being withdrawn from service, the “Prinz Heinrich” – Germany’s oldest coastal steamer – is about to take to the high seas again – thanks also to Loctite Fixmaster Marine Chocking epoxy resin from Henkel.

The “Prinz Heinrich,” a twin-screw coastal steamer built in the Meyerwerft yard (Papenburg) in 1909, is the last witness of its time – a figurehead of what was once Eastern Friesland’s fleet of steamers and the oldest passenger ship in Germany. During its early years, it conveyed passengers between Emden and Borkum, while in the war years it proved to be a useful supply ship. Subsequently it was renamed, converted and, in 1970, finally taken out of service and placed in an overseas exhibition where it fell into near-oblivion and an ever more lamentable condition.

But all that is in the past! Determined to restore this historical ship, devotees of the steamer, now the subject of a preservation order, founded the “Prinz Heinrich Club” in 2003, since which time they have invested heart and soul in returning it to its former glory and, indeed, getting it under steam again. The latter task is about to fall to Jonny and Hinni, the two historical steam engines, each of which weighs in at two and a half metric tons.

Heavy-duty foundations

Temperatures well below freezing point and an icy snowstorm make the dock in Leer in Eastern Friesland particularly unwelcoming on this Monday morning. For a team of eight retired mechanical engineers, shipbuilders and craftsmen, however, this is no problem. Deep down in the belly of the “Prinz Heinrich,” their task today is to pour a new foundation for Jonny and Hinni to stand on, using Loctite Fixmaster Marine Chocking from Henkel.

Loctite Fixmaster Marine Chocking is a two-component epoxy resin that offers enormous resistance against pressure, shock and vibration. It is therefore ideal for pouring foundations for heavy ship propulsion systems, mining machinery and other heavy equipment for which exact alignment and anchorage are essential. In marine navigation, where heavy seas give rise to high forces acting on the powertrains (as well as making a properly functioning drive system vitally important), such precision properties are essential in a foundation product.

The Hamburg company Marine- und Industrie-Montage GmbH (MIM), a Henkel-certified applicator center, has made quite a name for itself as a specialist in the pouring of liquid epoxy resin chocking systems. And MIM managing director Andreas Frese is on board the “Prinz Heinrich” to make sure that the placement of the foundations for the two steam engines goes according to plan.

Foundation pouring – fractions of a millimeter can make all the difference

Prior to the foundation pouring operation, Jonny and Hinni have been accurately positioned in their locations within the machine room by means of setscrews. “Fractions of millimeters can make all the difference here,” explains Frese. “If this positioning work is not done with sufficient precision, bearing damage can occur later on.” And this in turn can cause the entire drive system to seize and leave the ship drifting.

With great finesse, the volunteer ship restorers adjust the setscrews under the two 2.5 metric ton steam engines until they are positioned absolutely right. Now the foundation can be poured.

Epoxy resin instead of steel shims

“In poured foundations, epoxy resin replaces conventional steel shims,” notes Steffen Helisch, Henkel’s field sales representative responsible for supporting customers in the MRO (maintenance, repair and overhaul) sector. The old process, Helisch explains, traditionally involved the rather complicated insertion of thin metal shims below the steam engine which, due to the shocks and vibrations that occurred in operation, could become displaced, causing the drive train to become misaligned.

Not so with the pouring process, however. First, the two components of green-colored Loctite Fixmaster Marine Chocking have to be mixed together into a homogeneous liquid. This is done with a drill-operated mixing rod attachment running at 300 rpm for two to three minutes. Then, bucket after bucket, the mix is poured into the formwork trays under the steam engines until the cavity is completely filled. Once the epoxy resin has cured, the tight-fitting machine support it provides is ready for service. The product adapts precisely to the contours of the ship floor, as well as providing additional damping and reliable corrosion protection, even in areas that are difficult to access.

Simply pour

During the work, a heat blower ensures that the temperature in the hull of the “Prinz Heinrich” is kept at least a few degrees above freezing point. This accelerates the epoxy resin curing process. “Thanks to this particularly fast form of installation, downtimes and production standstills are kept to a minimum,” says Helisch, expanding on the salient benefits of this foundation pouring process.

Application is easy and can be performed by the contractor employees themselves. Henkel offers certified training courses. Prior participation in such courses is demanded under certain circumstances – for example, if the work being performed needs to be approved by a classification society. Then, a special certificate covering the application of epoxy resins to safety-relevant components in marine construction is required. If requested, MIM will also delegate an experienced expert to support and supervise the firm performing the pouring work.

Technology proven over the decades

The technology of foundation pouring with epoxy resin has been in existence for around 40 years. Some such epoxy foundations have been in service under ship machinery for 30 years now, exposed to the constant wear and tear caused by vibration, oil, fuels and water. “Until now, however, it has always been the engine that has failed rather than the poured foundation,” explains Frese.

Loctite Fixmaster Marine Chocking is approved by Germanischer Lloyd and all the usual classification societies encountered in the marine sector. The product from Henkel, world market leader for adhesives, sealants and surface treatment technologies, offers numerous advantages compared to conventional processes:

- Easy application
- Reduced installation times
- Resilient, durable and corrosion-resistant
- Prevents loosening of threaded bolts
- Dampens machine noise and vibration
- Global certification for shipping and mining applications

Further information:

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Henkel operates worldwide with leading brands and technologies in three business areas: Laundry & Home Care, Beauty Care and Adhesive Technologies. Founded in 1876, Henkel holds globally leading market positions both in the consumer and industrial businesses with well-known brands such as Persil, Schwarzkopf and Loctite. Henkel employs about 47,000 people and reported sales of 16,510 million euros and adjusted operating profit of 2,335 million euros in fiscal 2012. Henkel's preferred shares are listed in the German stock index DAX.

Photo material is available at http://www.henkel.com/press

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The following material is available:

Club members check the axial and radial runout of the steam engines and their thrust bearings.

The two components of Loctite Fixmaster Marine Chocking are blended together using a drill-operated mixing attachment.

Mixing takes two to three minutes at around 300 rpm to produce a homogenous compound from the two components.

Bucket after bucket of the epoxy resin is poured into the trays under the steam engines until the cavity is completely filled.

As soon as the epoxy resin has cured, it forms a foundation that perfectly matches the contours of the machine.

The “Prinz Heinrich” twin screwed steamer which was built at the Meyerwerft yard in 1909.

The “Prinz Heinrich” is Germany’s oldest coastal steamer.