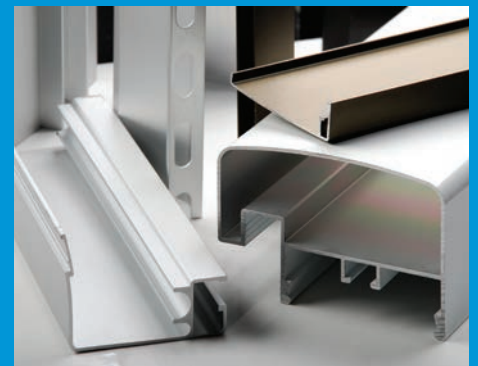


iSeal™ Advanced Surface Treatment for Protection against Tribocorrosion

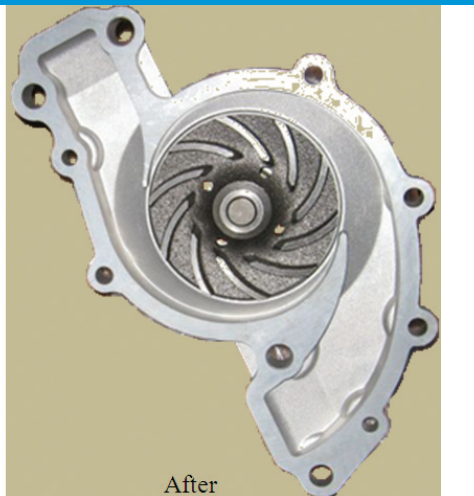


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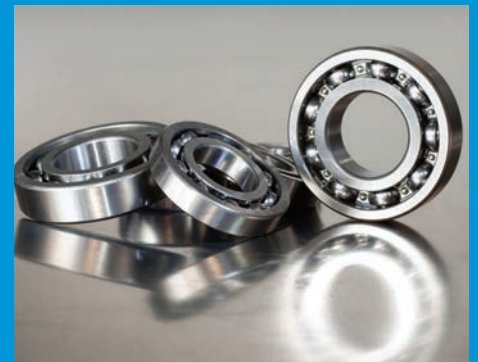
New Technology from DIT



Before



After



Protection against combined wear & corrosion

iSeal is an advanced surface treatment for the protection of surfaces against corrosion and combined wear & corrosion degradation (Tribocorrosion).

Current sealant treatments are either ineffective or expensive. Therefore sealant treatments to-date have had limited long-term success and users have underestimated the importance of an effective sealant treatment.

iSeal can be quickly, easily, and cost effectively implemented and has the potential to revolutionise porous wear resistant coatings.

iSeal is based on the application of a hybrid organic/inorganic treatment onto an exposed surface – either as a stand-alone treatment or as a sealant. The treatment is applied using an electrochemical deposition technique, allowing for the development of conformal coatings, irrespective of design complexity.

Layer thicknesses are extremely low (10-100nm) but resistance in corrosive marine environments

indicate corrosion rates comparable to technologies currently employed by the aerospace and automotive industries.

Tests to date indicate an exceptional level of performance. Corrosion rates are reduced by between 103 and 105 times, dependant on the nature of the porous coating. Tests on metallic coatings show a reduction of corrosion rates of approximately 103-104 and tests on ceramic coatings indicate a reduction in corrosion rates of approximately 105.

Applications

The principal application of iSeal is as a surface sealant treatment, with uses including:

- A pre-treatment for corrosion protection, suitable for industries such as aerospace, automotive and pulp & paper.
- A post-treatment (sealant) for porous wear resistant thermal spray or anodised coatings for advanced resistance to tribocorrosive degradation.
- Application on complex surfaces with tight conformal control on thickness, making it ideal for use on products such as extruders, mixers, valves and pump impellers.
- As a sealant, the technology can be applied to any conducting surface, including metals, metal composites and conducting polymers, giving it a wide usability scope.

Opportunity

With iSeal, concerns regarding the effect of mechanical damage are dramatically reduced. In addition, surface roughness levels are similar to electropolished finishes.

The global thermal spray industry is an established market worth approximately €5 billion per annum. Estimates project that the market is due to increase by 8.1% over the period 2014-2019.

iSeal is completely new hybrid technology applied using an electrochemical deposition technique which will have applications for companies manufacturing products for the aerospace, automotive and wave energy sectors.

Advantages

iSeal offers a number of advantages over current bespoke sealant treatments, including:

- **Low Cost** – a low-cost technique, which is highly effective in protecting the underlying material from corrosion.
- **Uniformity of thickness** – conformal treatment thicknesses can be applied independent of component design.
- **Flexibility** – can be used to seal any porous wear resistant coating.
- **May be applied in combination** – enhances the effectiveness of wear resistant coatings and reduces the effective surface roughness.

“iSeal has the potential to revolutionise industries using or applying porous wear resistant coatings”

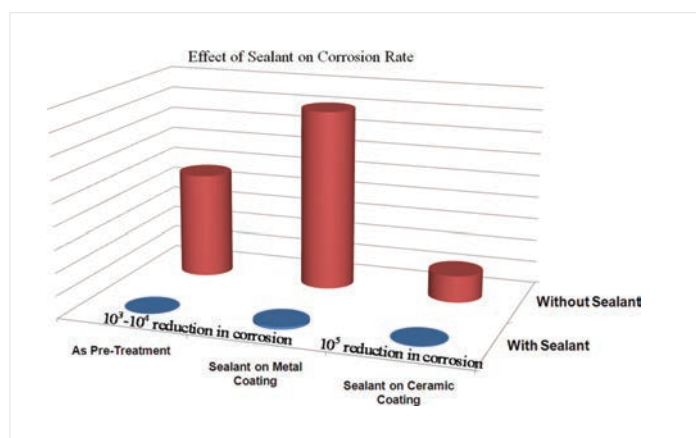
Stage of Development

iSeal was developed by researchers in the Dublin Institute of Technology (DIT) Focas Research Institute supported by funding from DIT and Enterprise Ireland.

The technology is capable of demonstration in a lab-bench environment but requires further commercial development to commercialise at scale.

The technology is patent-pending. Intricacies of the methodology and deposition specifications are protected as confidential know-how. Research surrounding applications of the technology is ongoing.

DIT is currently seeking expressions of interest from potential business partners interested in commercialising the technology via licensing or development of a new spin-out company.



Above: iSeal performance in reducing corrosion rates

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