Favuseals polymer-baserte brannbeskyttelse tåler varme på opp til 1500 grader celcius. Under sterk varme endrer materialet karakter til å bli som nanoporøs keramikk. (Bilde: Favuseal)

PLASTIC THAT CAN TAKE EXTREME FIRES

Favuseal analysed the world's most violent fires through time. The technology they have developed is extreme. It can prevent major accidents, both onshore and offshore

Can prevent major accidents

AV:: LARS TARALDSEN || OLJE OG GASS || ENGLISH VERSION

The small technology company, Favuseal, has investigated and analysed the world's most violent fires and developed solutions to protect cables, steel, and plastic pipes (GRE/GRP). This is achieved in a new way, which Favuseal believes is much more efficient than existing solutions.

Favuseal bases its technology on polymers, where the key focus is to control the expansion of the material when it comes into contact with fire and extremely high temperatures.

"We are the only technology provider in the world today who are able to control the expansion phase with our polymer-technology during a fire", says Chief Technology Officer at Favuseal, Christian Schlytter-Henrichsen to Teknisk Ukeblad in Norway

Extreme Expansion

Favuseal believes that their solution will, among other things, make it safer with insulation of cables on offshore structures, which at times can be at great risk of catching fire. The cables must be able to withstand jet fires. Schlytter-Henrichsen explains that the reason why Favuseal developed this solution is that existing solutions base their technology on an extreme expansion to build up a thermal barrier, which in turn protects the underlying surface.

The competing technologies he talks about includes epoxy-based intumescent paint or graphite-based polymers. “To function in a fire, these solutions are strongly dependent on the free expansion. This works great on structure and surface areas. However, it is not suitable for use on round objects, such as pipework and cables”, he states.

Plastic Becomes Ceramics

The expansion coefficient is way too dramatic. The change in diameter percentage becomes more extreme the smaller the object that is in need of protection is. In some cases, we are talking about more than 1,000 percent expansion, according Schlytter-Henrichsen.

Favuseal explains their core technology as a jet fire compliant flexible "plastic" that can be wrapped around objects, for fire protection purposes. The technology transforms itself into a micro-porous ceramic and stable structure when exposed to fire. This happens via two extremely energy-intensive processes where both stages are, in of itself, of an endothermic nature. The end result is a self-supporting micro-porous cell structure, which has extremely low thermal conductivity.

In both processes, we are only talking about a doubling of the thickness. It is, in other words, bespoke design for use on circular objects. The technology works as an *active* passive fire protection, according Schlytter-Henrichsen.

Costs a Crazy Amount of Money

Sintef Energy and SP Fire Research have previously tested the technology in which it was confirmed that e.g. cables now can withstand heat of up to 1,100 degrees for more than 60 minutes.

Test results were promising and are undoubtedly the future for increased fire safety in hydrocarbon zones, according to Sintef. Are Bruaset from Sintef Energy confirmed to TU, Norway that the technology is something completely different than existing solutions. He pointed out that substantial financial resources are used today to fire protect cables.

To satisfy the current standard, one has to fire protect all communication, instrumentation and voltage cables laying in the cable tray via applying e.g. products such as fire jackets, fire boxes, or any other means of passive fire protection work. This creates a lot more add-on work. In sum, it costs a crazy amount of money, says Bruaset at Sintef Energy. One option is to re-route the cables around hazardous areas, with everything that comes with it.

Mr Bruaset says that the technology is exciting and will have a very positive impact.

It will have serious consequences for HSM related work within process plants, platforms, ships, and other areas related to oil and gas as risks will be mitigated and total ownership cost will be driven down, according to Mr Bruaset

Will Withstand the Worst-case fire Scenario

Schlytter-Henrichsen tells TU that the aftermath of these tests confirmed that the technology can withstand up to 1,500 degrees. Besides, he says, there is another important point of their technology. It will hardly generate any visible smoke nor will it generate any toxic fumes when exposed to fire. Research shows that 80 percent of all deaths are due to inhalation of smoke and not because of temperature, he says.

In the development of the technology, Favuseal followed a strategy where they have focused on the world´s worst fires, in order to adapt products and solutions based on Favuseal towards such scenarios. “Now that we are able to withstand a hydrocarbon fire under pressure – also called jet fire – then all other fire scenarios are relatively easy after that”, says Sales Manager Svein Oscar Skjærli in a message from the company to TU.

The market is quite small, but we wanted to prove that we can resist the worst possible scenario, which may occur on an oil platform: Full-scale jet fires, according Skjærli.

Nervous Mood within the Company

Favuseal currently has agreements with major international companies, such as Bilfinger, National Oilwell FGS, Prysmian, General Cable, and Prezioso Linjebygg. They are not little league in an international context, according to CTO Schlytter-Henrichsen.

It's a nervous atmosphere in the company. All development costs have been carried on our expense for several years and tens of millions kroner have been spent on miscellaneous tests and finally market-ready products and solutions to be distributed in the market-place. The groundwork is done and more than ten new products will be launched through partners in the future. Now it's all about the execution and success of our partners, he says.