2019 Award Nomination

Title of Innovation: Halar® ECTFE Waterborne Coating Systems

Nominee(s)
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Category:
- Coatings and Linings
- Instrumentation
- Cathodic Protection
- Testing
- Materials Design
- Integrity Assessment
- Chemical Treatment
- Other—fill in

Dates of Innovation Development:


Summary Description:
Prior to this waterborne innovation, Halar® ECTFE could be applied only by powder coating. The powder coating method limited the use of the material to coating specific components. The new waterborne system provides the ability to coat smaller diameter pipe, tanks (vessels), or objects with complex shapes or geometries. The innovation enables the application of the material to coat objects where the powder coating failed to provide good adhesion. This waterborne systems allows for the necessary adhesion by application of a two coating aqueous system that is also environmental friendly.
Full Description:
(Please provide complete answers to the questions below. Graphs, charts, and photos can be inserted to support the answers.)

1. What is the innovation?
The innovation is a two-coat (primer + top coat) aqueous Halar® ECTFE coating.

2. How does the innovation work?
The waterborne coating systems is air assisted, mix air and airless spray system. The waterborne coatings are applied without preheating.

3. Describe the corrosion problem or technological gap that sparked the development of the innovation? How does the innovation improve upon existing methods/technologies to address this corrosion problem or provide a new solution to bridge the technology gap?
Prior to this waterborne innovation, Halar® ECTFE could be applied only by powder coating. The powder coating method limited the ability to coat smaller diameter pipe, tanks (vessels), or objects with complex shapes or geometries. The innovation enables the application of the material to coat objects where the powder coating failed to provide good adhesion. This waterborne systems allows for the necessary adhesion by application of a two coating aqueous system that is also environmental friendly.

Moreover, the water based Halar® ECTFE system can be applied without preheating step providing easy and safety advantages for example for tank-interiors coating where ECTFE is already recognized as suitable material.

4. Has the innovation been tested in the laboratory or in the field? If so, please describe any tests or field demonstrations and the results that support the capability and feasibility of the innovation.
Yes. First, in the lab, the waterborne system has been tested in three different types of applications, pipes, closed vessels, and tanks. The testing resulted in the possible the coating of internal diameter of long pipes, closed vessels and tanks. The water based system demonstrated that it was possible to reduce of number of layers to achieve the final thickness.

Secondly, the ECTFE waterborne system was field tested. The testing resulted with success in coating the ID pipe of long pipes as well as open tanks.

The characterization of the coated parts showed equivalent corrosion protection compared to the powder system. Additionally, the aqueous suspension remains homogeneous after prolonged storage time and requires only mild and brief agitation before the application.
5. How can the innovation be incorporated into existing corrosion prevention and control activities and how does it benefit the industry/industries it serves (i.e., does it provide a cost and/or time savings; improve an inspection, testing, or data collection process; help to extend the service life of assets or corrosion-control systems, etc.)?

The waterborne ECTFE innovation provides an economic benefit compared with CRA (corrosion resistant alloys) and also fluoropolymer lined pipe. Waterborne ECTFE provides homogeneous corrosion protection and can be used to coat a range of chemical process industry applications including the following: pipes, valves, fittings, tanks, reactors, probes and sensors, among others.

The water based Halar® system extends the Halar® ECTFE product portfolio. The waterborne system can be applied with conventional coatings techniques such as spraying or dipping. Potential commercial use extends beyond the chemical process industry to also allow for the coating of internal pipes and complex parts used in the oil and gas industry where powder coating used EPC methods have limitations.

6. Is the innovation commercially available? If yes, how long has it been utilized? If not, what is the next step in making the innovation commercially available? What are the challenges, if any, that may affect further development or use of this innovation and how could they be overcome?
The innovation is not yet commercial but it is under commercial assessment where we are working to conduct global sampling trials and evaluations at the select coaters and customers.

The commercial market entry will be finalized upon receiving feedback from the trial evaluations. A potential challenge could be the need to adjust the formulation to achieve certain process or property improvements.

7. Are there any patents related to this work? If yes, please provide the patent title, number, and inventor.

A patent has been pursued as shown below.

S: Title: COATING COMPOSITIONS Number: WO 2016/075067 A1, Inventors: CARELLA, Serena; POLASTRI, Fabio; MENNELLA, Amelia; MAGGI, Giorgio.