**Polyamide 11 Coatings An Alternative To Stainless Steel**

**In Water and Wastewater Treatment Plants**

**Alexa Thomas, ARKEMA France, Le Mans, FR
Adrien Lapeyre, Arkema Inc, Philadelphia, PA**

**Introduction**

The increasing consumption of water throughout the world for both domestic and industrial use combined with its scarcity due to the climate change requires innovative solutions including those in membrane filtration. Rilsan® polyamide 11 coatings allow engineers and contractors to subcontracts lower operating costs and capital expenditures in water treatment plants using these membrane technologies.

**Polyamide 11 coatings**

Rilsan® polyamide 11 is a high performance thermoplastic material obtained by the polycondensation of 11 an amino undecanoic acid, which is of vegetable origin: castor oil. It contributes to sustainable management, standards from all over the world (Holland—KIWA K-759, USA—NSF 61, Europe—EN 10203) covers the following points:

- Effect of coating materials on water quality using standards in force
- Coating material properties (resistance to impact, water immersion, corrosion...)
- Application procedure (surface preparation, primer application, coating...)
- Quality control on coated parts (Appearance, thickness, holiday detection, adhesion...)
- PA 11 coatings: A cost effective alternative in membrane treatment plants

Membrane filtration has been growing very fast last years as membrane technologies bring to water companies and municipalities the following benefits:

- Water quality preservation:
  - SWRO and DMFW in UK,
  - DOW-V1 and DOW-VG in Germany
- Energy typically represents 30% of operating expenses for SWRO desalination plants. Standard energy savings are around 3 % with hybrid of produced water including energy recovery. Reducing pressure losses by using new materials can prevent fouling and decrease energy consumption.

Membrane filtration systems using polyamide-11 coated piping systems appear to be one of the best solutions for delivering high quality treated water at optimum CAPS and OPEX.

**Material costs**

The piping system represents 15% of the capital cost of a water treatment plant. The cost of an installed piping system in a water treatment plant depends not only on the material costs (pipes and fittings) but also on the shop fabrication, the field installation costs as well as the equipment and contractor fees. For instance:

- Welding stainless steel will be more expensive than welding polyamide-11, increasing the costs for shop fabrication and field installation.
- Glass reinforced plastic (GRP) pipes cannot be shop fabricated like steel piping, which means that the cost of polyamide-11 for complex parts but there is no cost for shop fabrication.
- Coated pipes cannot be welded on site. So more pre fabrication work is required. This is balanced by a superior assembly time of welded pipes versus welded pipe requiring contractor fees.

**PA 11 coatings: A cost effective alternative in membrane treatment plants**

**Polyamide 11 in water industry**

Polyamide 11 has been used in water industry for coating pipes, pumps, valves and fittings since 1967. Numerous references show the advantages of using this coating technology, municipalities and industry across the following benefits:

- Water quality preservation:
  - SWRO and DMFW in UK
  - DOW-V1 and DOW-VG in Germany

**References**

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