

INTERNAL PIPELINE COATING

TECHNICAL PROBLEMS

Pipes, whether made from cast iron, steel or fibres containing cement, require an effective internal lining to ensure:

- protection against any corrosion from the fluids transported.
- protection against wear from the erosion caused by the fluids passing through (whether loaded with particles or not)
- improved flow conditions for the fluid by reducing the head losses.

Depending on the problem, a satisfactory solution for the treatment of the joints must also be found.

TRADITIONAL SOLUTION

The following techniques are often used:

- **anti-corrosion protection:** If the liquids are highly corrosive, or simply seawater pipes which require greater durability, these pipes are generally given a heat-sealed ebonite lining.

The drawback: it needs to be fired in a kiln. This generally limits the dimensions of the joints to 6m and means that they can only be assembled using flanges.

If the liquids are mildly corrosive, internal protection is provided by a solvent-free epoxy, epoxy pitch or paint.

- **anti-wear protection:** Anti-wear panels are affixed in extreme-wear zones, highly resistant ceramics are used to line the pipes, highly resistant materials such as basalt and zirconium alloys are used.

The drawback: these techniques only resolve the issue of wear, but not corrosion (not a continuous layer of protection).

This could present a problem, depending on the aggressiveness of the fluids being transported. They are generally difficult to install and are expensive.

- **treatment to reduce the head loss:** an epoxy-based, thin film is applied to the interior of the film to improve these characteristics.

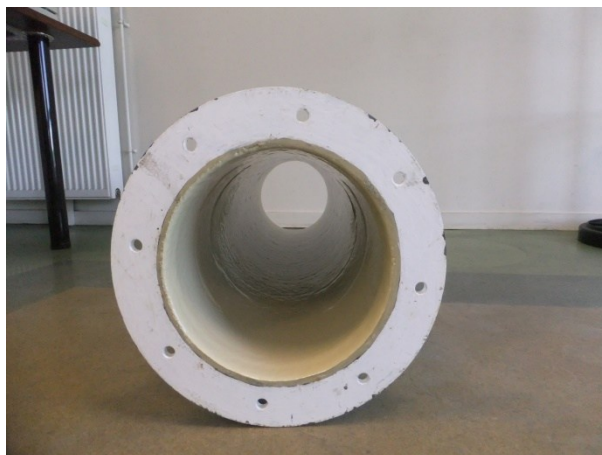
The drawback: in the event of erosion, problems may appear, and the flow may be affected in the damaged zones.

TESTS AND CERTIFICATIONS

- Resistance to salt mist: SNCF-Levallois Laboratory - 000 h salt mist
- Chemical resistance: Labo SGN, Rhône Poulenc
- Resistance to de-icing salt: Bouygues- Cebtp

WORK REFERENCES

- COGEMA: The Hague: outflow pipes in the sea
- CEA - Mururoa
- Coke plant in Drocourt : factory waste (pH = 1)
- DCAN - Cherbourg



SOUPLETHANE TECHNIQUE

SOUPLETHANE UR 6 is sprayed using a twin-component high-pressure airless pump fitted with a high-speed turbine (20,000 rpm). This technique allows you to coat pipes from 10 cm in diameter, with no upper limit (beyond a diameter of 1.50 m, it can be applied with a gun). The thickness of the internal layer of coating can range from 0.5 mm to 1 cm, for areas suffering from abrasion, for example.

- **the advantage:** it can be applied in the workshop, using a cold spray with no solvents. The joints are then treated on site to ensure that the layer of coating is continuous and consistent. Flanges are only necessary for pipes with smaller diameters.

A thicker application is possible by applying successive coats. This will improve the resistance to corrosion and wear.

SOUPLETHANE UR 5 offers excellent resistance to most chemicals (pH levels from 1 to 13), including H₂S and related products. Using this allows to significantly reduce the head losses in a fluid: tests have shown that a tube coated with SOUPLETHANE can provide a flow 30 % higher than that circulating in an uncoated tube. The energy required to force a given flow of fluid through a tube is significantly lower than that required for an uncoated tube).

SPECIFICATION

- Shot-blasting SA 2.5 • carefully remove any dust
- Continuous application of SOUPLETHANE UR 6 until the desired thickness is obtained.
- If using flange assembly: ensure that you continue the coating out onto the interior of the flange.
- If welding the joints: protect the pipe 10 cm from each end to allow you to weld. The joint will be treated on site when it's time to install it.

QUALITY CONTROL

- Coat the tube within 6 hours of shot-blasting it.
- Before coating the tubes, treat a sample length of tube in order to run adhesion tests
- Check the thickness using a micro-tester
- Check the porosity using a holiday detector (voltage adjusted to 3 000 Volts/mm of thickness).