

Cooling water pipe system

Kuala Langat Power station, Malaysia

When the piping challenge involves corrosive liquids - especially extreme environments like salt water at high temperatures - the solution can often be easier and cheaper than expected. Johnston Pipes manufacture large diameter GRP pressure and gravity pipes by centrifugal casting; a process which compacts resin, glassfibre and silica sand to form a dense structure.

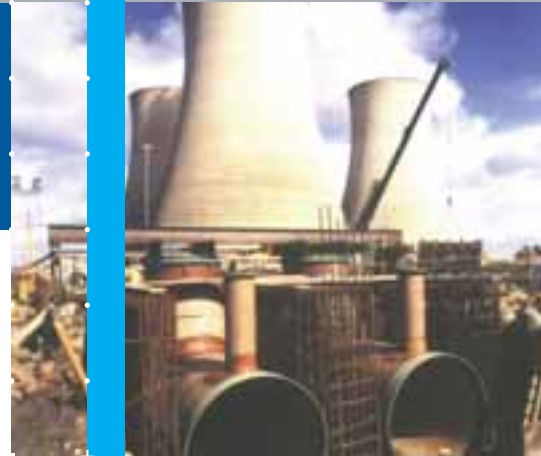
COOLING SYSTEM PIPEWORK

The UK based Johnston pipesystems became the first Hobas licensee in 1973 and has since supplied thousands of metres of light weight, corrosion resistant pipelines for sewage, drainage and water installations.

Johnston has completed projects at a number of power stations where their 'Armaflo' pipes have been installed for water cooling systems. Some 300 metres of 2 metre diameter pipe were installed at Kuala Langat, Malaysia, a 660

megawatt combined cycle gas turbine power station.

The technical demands of this application were quite high: the pipe had to withstand brackish river water at 70°C under 5 bar working pressure, together with dosings of sulphuric acid and sodium hypochlorite to prevent calcium carbonate build-up. A further consideration was the potential for acidic ground conditions because of the proximity of a wood pulp mill. Had a steel pipe system been used, expensive



SUMMARY

> Armaflo or cooling water pipes

OPERATING CONDITIONS

> Sulphuric acid, Sodium hypochlorite and calcium carbonate at an working temperature of 70°C. Maximal internal pressure of 5 Bars.

ATLAC SOLUTION

> Atlac 580

IN SERVICE

> Early 1996

BENEFITS

> Corrosion free no expansive corrosion protection treatment. Chemical, pressure and heat resistant. Light weight. Ease of application

REMARKS

> The equipment is part of a 600 MW. Water supported power station in combination with a gas turbine. The environment is manipulated by the temporarily dosing of Sulphuric acid and Sodium hypochlorite to prevent calcium carbonate.

corrosion protection treatment would have been necessary and thermal movement would have been difficult to accommodate.

THE ATLAC SOLUTION

To accommodate all these requirements, a high performance resin system was required. Atlac 580 meets all these technical requirements coupled with easy processability and a low peak exotherm. Atlac 580 is a bisphenol A based vinylester urethane resin suitable for high temperature water, acid and salt solutions.

THE SUCCESS STORY CONTINUES

In other power station cooling systems, Atlac 580 has been used as a resin rich inner liner, giving good flow characteristics with maximum anti-corrosion protection.

These include Teesside, Killinghome and Didcot in the UK. At Teesside power station, one kilometre of GRP pipe in varying sizes was used for a combined air and water cooling system.

This above ground arrangement had many complex orientations and connections.

Installation was greatly facilitated by the simple, non-tensile resistant push fit jointing system used by Johnston. The same installation in steel would have required many extra manhours during

installation.

About DSM

DSM Composite Resins is the largest producer of unsaturated polyester resins in Europe. With production facilities in many different European countries, DSM Composite Resins offers a wide range of resins, matching every conceivable processing and end-use requirement, in the most diverse applications. Local Sales offices and Technical Service laboratories enable close cooperation and partnerships between customers and DSM Composite Resins. Central Research & Development is fully equipped to develop and test new resins and to tune systems for optimal results in specific processing techniques. The development, service and manufacture of composite resins are certified according to ISO 9001.

About Atlac

For several decades Atlac resins have proven themselves highly suitable in applications where chemical and thermal resistance in combination with high mechanical properties are required. Atlac resins have outstanding corrosion resistance to a wide range of organic and inorganic acids, alkalines, solvents and bleaches. They are widely used for fibre-reinforced applications such as storage tanks, vessels, pipes and ducts. The Atlac resins can be processed by means of a wide range of fabrication techniques, including filament winding, hand layup, spray-up, and polymer concrete.

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Technical details

Application	Cooling water pipes
Medium	Sulphuric acid, Sodium hypochlorite, Calcium carbonate
Conditions	Working temperature of 70°C. internal pressure of 5 Bar.
Construction details	300m long and a diameter of 2.00 Metres
Resin	Atlac 580
Commissioning	1996
Inspected	-
Manufacturer	Johnston pipes
End user	Kuala Langat Power station
Location	Malaysia
Remarks	