

# DERAKANE™ Epoxy Vinyl Ester Resins

## Case History

### 15 years success - First solar-adaptable, non-corrosive, and non-metallic Xstream water boiler



#### Location / Year

Since 2003 in Paarl, Western Cape, South Africa.

#### Manufacturer

XStream Solar Hot Water Cylinders (Pty) Ltd.

#### Fabrication

Hand lay-up with glass fibre reinforcement and **DERAKANE 411** epoxy vinyl ester resin.

#### Technical Data

Diameter: e.g. 485 mm (19 in)  
Length: e.g. 1520 or 1920 mm (60 in or 75 in)  
Direct/indirect solar tanks 50 to 200 liters (13 to 53 gal)  
Pressure: 400 kPa (58 psi)  
Also: Open to vent (atmospheric) insulated tanks in 650 and 2 000-litre (170 to 530 gal) capacity.

#### Service Conditions

Extreme environment and water conditions.  
Service Temperature: 70°C (158°F) and more.

#### Comment/Design

It is common knowledge that corrosion, metal fatigue, lining problems and some or other form of galvanic reactions associated with various types of metal, traditionally used in the construction of inner tanks for boiler, are the main causes of the premature failing of hot water tanks. Together with the University of Cape Town, design engineer Willie Meissner was commissioned to build a finite element model to simulate the environment wherein boiler operate, and to eliminate the bulk of the causes of failure.

The solution came through identifying non-ferrous materials that could withstand the demanding conditions under which high-pressure tanks operate, being that the inner tank must perform under pressure, at high temperatures, and survive an extremely aggressive chemical-corrosive environment, while the outer must have an aesthetically pleasing look and feel, be noncorrosive, and possess low heat-loss qualities. The combination of materials used in production (Epoxy Vinyl Ester and Glass) ensures minimal heat loss and is nine times stronger than metal on a weight to weight basis. It can be installed interior or exterior.

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