



## Rotathene® SUPA UV Poly Tanks: Stress Testing Rainwater Tanks in Extreme Environments

### Rotathene® SUPA UV

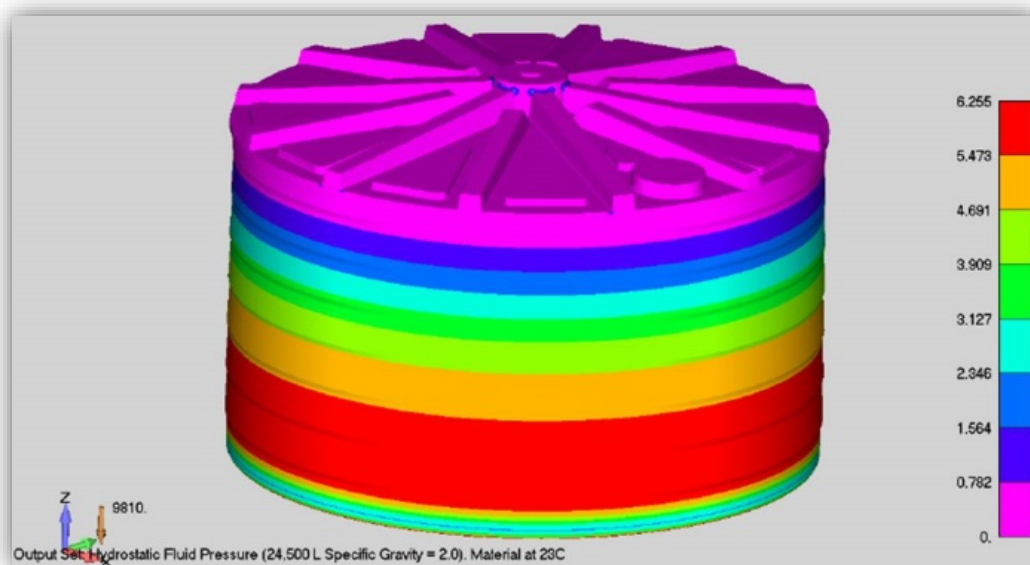
Rotathene® provides a much higher level of protection against the Sun than the required industry standard for poly tanks. It is referred to as “SUPA UV” for this reason. Rotathene® SUPA UV provides superior protection for rotomoulded products by incorporating advanced additive technology to provide.

Traditionally a UV8 level of stabilisation has been considered the minimum required for good long term protection in Australia. This is the level specified in the Australian Tanks Standard, AS/NZS4766:2006. As seen in our article, [\*Testing Poly Tank Sun Protection: Rotathene SUPA UV Polyethylene\*](#), Rotathene® SUPA UV incorporates advanced additive technology to provide UV protection well in excess of the standards specified.

### Stress Testing of “SUPA UV” Poly Tanks

The main purpose of a tank is to hold water or chemicals. In order to do this, a tank needs to be designed to withstand loads applied to the tank, in particular the pressure of the contents. Polyethylene stretches slightly when a load is applied to it such as when the tank is filled and being able to predict how a tank will behave when it is filled and used over many years, is very important.

In order to do this one needs to understand how the PE stretches or ‘creeps’ under stress. Extensive creep testing is conducted both locally and overseas on Rotathene® SUPA UV tank grade materials. This testing is performed under different stress levels and at different temperatures to obtain information that is vital to professional design engineers who design these tanks.



**Figure 1: Stress Intensities due to fluid pressure**

The design of the tank is checked using Finite Element Analysis. This is a special computer design program used by design engineers which predicts how the contents of the tank will affect stress intensities in the tanks and what deflections or level of creep may be expected due to this stress over a reasonable service life.

**Figure 1** shows the stress intensities generated in a tank by the contents. The red areas have the highest stress intensity and pink the lowest. As one can see from this, the highest stress will be found near the base of the tank wall where the pressure is greatest, as one may well expect.

By using FEA, the appropriate wall thicknesses can be determined and the effect of design features can be examined to optimise the expected performance of the tank. This analysis is done using the assumption that the tank will be properly installed on a flat and level platform and that the tank is plumbed correctly.

Understand that a sloping platform or presence of stones or anything else causing an uneven surface under the tank will introduce stresses which would not have been accounted for in the design and could have adverse consequences to the life expectancy of the tank. The same may be true of heavy or rigid fittings which are attached to the tank without due consideration for appropriate support and movement. It is therefore important to follow the installation instructions fully.

## **Rotathene® SUPA UV – Making tanks built to last in Extreme Environments**

Through careful selection of a high quality Polyethylene base polymer specially designed for tanks and having the increased SUPA UV level of protection, the National Poly Industries Group in conjunction with its material supplier, Matrix Polymers, can ensure that it has the best materials with which to make their tanks.

Using professional design engineers and Finite Element Analysis in the design of these tanks as well as moulding and testing the tanks to the requirements of the Australian Tank Standard AS4766, optimises the properties of the materials used in the manufacture of these tanks and affords the end user the knowledge that they have a superior product designed for the harsh Australian conditions.

***National Poly Industries** is a privately owned Australian company manufacturing tanks for over 20 years and polyethylene tanks for over 15 years. We are well-established company and known as a pioneering poly tank manufacturer dedicated to being the absolute leader in the polyethylene rainwater tank market and associated product groups.*

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If you have found this article helpful and are looking for a water tank, talk to our friendly staff today to discuss your needs or get an obligation free quote.

**Phone:** 1800 758 709 **Website:** [www.nationalpolyindustries.com.au](http://www.nationalpolyindustries.com.au)

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National Poly Industries is a privately owned Australian company manufacturing tanks for over 20 years and polyethylene tanks for over 15 years.

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