

Atlac resins: the ultimate in long-term dependability

This issue of Global Solutions illustrates once more the fantastic opportunities that exist for Atlac FRP systems. Even under the toughest, most aggressive operating conditions, Atlac resins have proven, time and again, to be the ideal anti-corrosion solution for tanks and pipes.

This long service life is clearly evident in the case study (below) where an FRP stack, based on Atlac 382, has withstood highly corrosive operating conditions for almost 30 years.

As well as resin choice, the design of the system is equally important. By training engineers in the principles of FRP design, DSM Composite Resins shows its commitment to the anti-corrosion industry (see page 3) and builds greater understanding of the many possibilities and benefits that FRP brings to this industry.



Atlac 382 stack in South Africa

Atlac 382 in 30 year old stack STANDING THE TEST OF TIME

Fibre reinforced plastics (FRP) are well-known for their intrinsic chemical and high temperature resistance behaviour. With the introduction of Atlac 382 bisphenolic unsaturated polyester (UP) resins in the early 1960's, a new market segment was created. The material proved to be the ideal anti-corrosive solution for FRP tanks, containers, pipes, ductings and chimneys. Following the success of Atlac 382 other

types of resins (vinyl ester resins) were launched into this segment.

Ever since its launch, the high performance behaviour of Atlac 382 has been continually proven. Standing testament to the materials long-term corrosion resistance are the 30-year-old FRP equipment and pipework still in service today, throughout the world.

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Reliability is key

Ask any engineer in the petrochemical or mining industry what the single most important criterion for FRP equipment is and they will most likely answer with one word: 'reliability'. The reputation of FRP for reliability, even after many years of dependable and documented service, still lags behind steel. But anyone with experience in the design and production of FRP equipment knows that its reliability is at least equal to steel. This fact is born out by the many well-documented cases that we regularly publish in Global Solutions. If you have similar examples and would like to share them with our readers around the world, then please send us your case history and we'll be happy to publish it.

Jan Lodewijk Lindemulder
Business Manager

Everything about Biodiesel

What is Biodiesel?

Biodiesel is the name for a clean burning alternative fuel, produced from domestic, renewable resources. Biodiesel is simple to use, bio-degradable, non-toxic, and essentially free of sulphur and aromatics.

How is Biodiesel produced?

Biodiesel is made through a chemical process called trans-esterification whereby the glycerin is separated from the fat or vegetable oil. The process leaves behind two products -- methyl esters (the chemical name for biodiesel) and glycerin.

Why Biodiesel?

The use of alternative fuels from renewable vegetable sources has become increasingly widespread in recent years, as the life cycle of biogenic fuels is neutral with respect to CO₂ release. In contrast to fossil fuels, biogenic fuels neither contribute to the accumulation of CO₂ in the atmosphere nor to global warming.

Is biodiesel used as a pure fuel?

Mineral Diesel fuel is rapidly replaced by plant oil derived biodiesel. By December 2010 5,75% of fuel for road transport consumption in the EU has to be derived from renewable sources. Currently already much higher concentrations of biodiesel are used.

Do I need special storage facilities?

In general, the standard storage and handling procedures used for petroleum diesel can be used for biodiesel. The fuel should be stored in a clean, dry, dark environment.

Can I use biodiesel in my existing engine?

Biodiesel can be operated in any diesel engine with little or no modification to the engine or the fuel system. Biodiesel has a solvent effect that may release deposits accumulated on tank walls and pipes from previous diesel fuel storage. The release of deposits may clog filters initially and precautions should be taken. Use only fuel meeting the biodiesel specification!



Atlac storage tanks at biodiesel plant in Emmen

Atlac 430 used for Biodiesel storage

Since biodiesel production involves corrosive raw materials, process chemicals and end-products, vinyl ester FRP tanks provide the ideal storage solution. FRP composites also bring additional benefits over steel, such as self-insulating properties and lower maintenance costs (no painting or other anti-corrosion treatments).

NEW BIODIESEL PLANT

The company Polem (NL) produced 14 tanks of various sizes (90 – 470m³) for the new Sunoil

biodiesel plant in Emmen. Sunoil B.V. is founded by Eurogrenzland and one of the first companies to operate a biodiesel plant in The Netherlands. The biodiesel plant is designed by AT from Baden-Württemberg, who have already built dozens of plants for bio fuel across Europe.

Polem used steel heating coils in the FRP tanks and included PUR foam insulation. Since heating and insulation are integral parts of the structure, the tanks were delivered ready-assembled.

Tanks were installed at the rate of three a day, with only minor mounting work left to be done on-site.

POLEM BENEFITS FROM ATLAC 430

The tanks have an Atlac 430 chemical resistant layer of 2,5 mm thickness according to ISO 13121. This well established vinyl ester is a workhorse resin for many applications where chemical resistance and/or temperature resistance is needed. Polem benefits from the easy processing of this resin both in spray-up processing (for tank roofs and bases) and spray winding (for vessels used to store a wide range of products).



Biodiesel fuel station

WORLD'S LARGEST FRP STACK IN SOUTH AFRICA

Between the 1960s and 80s, Atlac 382 was the anti-corrosion resin of choice for the South African region, and many items of equipment manufactured decades ago are still functioning perfectly today. One of the most impressive examples is the 28 year old stack erected at the Mineral Process Plant, Impala Platinum Limited in North West – South Africa.

During the late 70's, the South African FRP manufacturer, Fibre-Wound, installed this stack on Impala Platinum's production site. Fibre-Wound is South Africa's leading manufacturer of non-metallic corrosion resistant products. With its origins as a small private manufacturer of glass fibre reinforced plastic tanks for farmers and the chemical industry in the mid 70s, the Fibre-Wound group has grown into an internationally recognised player in the anti-

corrosion market.

CLEAR BENEFITS

At the time the Impala stack was erected, it was reported to be the world's largest FRP chimney stack. With a diameter of 3.3 m, the stack is supported by a brickwork base and steel frame construction. It was designed to withstand highly corrosive environments at temperatures up to 150°C and wind loadings of 112 km/h. Most of the ducting system is also FRP. Impala Platinum Ltd selected FRP because of the following typical benefits:

- Lower overall cost compared to stainless steel or lined mild steel systems
- Easy transportation and installation due to lighter weight compared to metal equivalent
- Excellent chemical resistance behaviour
- Reduction of maintenance

A FURTHER 30 YEARS SERVICE?

Engineers from Fibre-Wound and Impala Platinum Ltd have regularly monitored the stack. They've hardly needed to make any repairs and over the last 30 years the stack has operated successfully. There's no reason to believe it won't survive for another 30 years.



South Africa's chemical and mining industry offering large opportunities for FRP materials

FRP pipe system design training course in South Africa

May 2006, Johannesburg: 15 well experienced engineers enter the room for their exam. After completing a three day FRP training course given by DSM Composite Resins' Business Development Manager Jeroen van Bussel and Mr. Hans Bos of Dynaflo, the final test will assess what the participants have learnt.

This is just one of a series of initiatives by DSM Composite Resins to inform designers and specifiers about the benefits of composites in engineering applications. Training engineers in the principles of designing in GRP underscores DSM's commitment to growing this important sector internationally. It is also an opportunity to

demonstrate the unique qualities and versatility of properly designed GRP composite solutions.

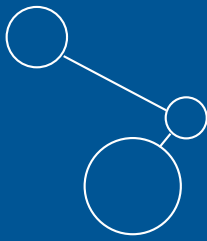
The training course consists of different modules, dealing with the base materials and composition of GRP and the consequential mechanical properties, laminate and pipe design. But the main component deals with stress analysis calculations - including the effects and consequences of changing a steel pipe system into GRP and how to deal with the flexibilities in the system.

As Jeroen van Brussel commented: "through education and training we will increase the knowledge on FRP materials and promote the



Training course in South Africa

benefits of Atlac resins in corrosion resistant applications."



Your invitation to a special event

DSM Composite Resins is an internationally recognised market leader in technically innovative, high performance, anti-corrosion resins.

By attending our Corrosion Resistance FRP symposium (see details opposite), you can tap into over 40 years of know-how and expertise; and gain valuable knowledge that will help you specify optimal FRP solutions for tanks, pipes and vessels.

CORROSION RESISTANT FRP SYMPOSIUM

This coming autumn, DSM Composite Resins will organize their first international Corrosion Resistant FRP symposium. This two days event will take place on October 17 and 18, at the DSM offices in Geleen, in the South of the Netherlands.

At the symposium, international speakers will present interesting cases where FRP materials have been used. We will not only focus on the success stories - of which there are many - but we'll also look at some of the failures and examine, in detail, why they occurred. Customers, engineers and end-users will be brought together to share experiences and to learn from each other in an open and cooperative way. This way we can take maximum advantage of the huge opportunities that exist for FRP materials in the anti-corrosion sector.

Here are some of the speakers that will be contributing to the symposium:

Dr. Hans Bos (Dynaflow), Mr. Wil Moeling (DM Tanksystems), Mr. Gunnar Bergman (Swedish Corrosion Institute), Mr. Carlos Müller (BASF Chile), Mr. Corné Uytendewilligen (General Electric Plastics), Prof. Dr. Nonhoff (presentation of Christen & Laudon case)

This event has been principally organized to promote the use of FRP materials in general and to point out their advantages over competitive materials. Naturally, as hosts of the symposium, we will also be highlighting the DSM Atlac vinyl ester resin portfolio and presenting the latest developments.

Members of the anti corrosion expertise centre will be available on both days to answer your specific questions and discuss your storage and handling challenges. We are confident that you will find this symposium informative, motivational and an excellent investment of your time. Places are limited so please contact our Expertise Centre to reserve your place.

EVENTS

ECCM 12	29 August-1 September 2006, Biarritz, France	www.fe.up.pt/ECCM12
CHINA COMPOSITES EXPO 2006	4-6 September 2006, Shanghai, China	www.chinacompositesexpo.com
9TH INTERNATIONAL AVK CONFERENCE	19-20 September 2006, Essen, Germany	www.avk-tv.de
COMPOSITES EUROPE 2006	20-22 September 2006, Essen, Germany	www.composites-europe.com
COMPOSITES 2006	10-12 October 2006, Munich, Germany	www.compositese.de
COMPOSITES 2006	18-20 October 2006, St Louis, Missouri, USA	www.acmashow.org

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