Enhanced Oil Recovery in Southeast Asia Includes Vipel Technology

Market Segments:	Chemical Processing Storage Tank
Composite Application:	Brine storage vessel
Resin:	Vipel® F080 bisphenol-A epoxy vinyl ester
Manufacturing Process:	On-site filament winding
Diameter:	25 feet (7.6 meters)
Height:	16 feet (4.9 meters)
Capacity:	1,400 barrels (167,000 liters)
Installed:	2012
Location:	Province Riau, Indonesia

One of Southeast Asia's largest oil fields needs the chemical resistance of Vipel® vinyl ester from AOC to improve oil recovery.

Vipel technology plays a critical role in one step of enhanced recovery at the Minas Oil Field in Province Riau, Indonesia. This field has been serving the world's energy needs since the middle of the 20th Century and still has still significant oil reserves for owner Chevron Corporation. However, the oil in older wells is becoming more difficult to reach.

To increase production, Chevron turned to global engineering resource Technip to design a recovery system that uses cutting-edge technology. Technip provided engineering services, project management and construction of an advanced system that maximizes oil recovery. The system injects a special, low-cost "surfactant" fluid

The manufactured storage vessel is set into place.

in designated wells. As fluid from the "injector" wells floods the underground reservoir, oil is pushed toward a "producer" well where pressure is increased to more easily extract the remaining oil.

A by-product of this "flooding" is a highly corrosive brine solution that is extracted along with the oil. Technip's system separates and stores the brine in a special tank until it is ready for the next step in the process.

On-site manufacturing

Because of the high heat and corrosive nature of the brine, the storage tank had to be made of a high-performance material. PT Graha Adhi Jaya Abadi FRP Engineering & Manufacturing, called GAJAFIBERGLASS, made the cylindrical vessel on site using filament winding manufacturing. The operation required precise control of the resin temperature prior to winding to prevent ambient heat from initiating a resin cure.

The process started with the application of an anti-corrosion liner made up of a resin-saturated surfacing veil onto a horizontal, cylindrical mandrel. The liner was backed with a structural laminate of resin-impregnated continuous fiberglass that was applied as the mandrel rotated. The finished tank is 25 feet in diameter by 16 feet high (7.6 by 4.9 meters) and has a capacity of 1,400 barrels (167,000 liters).

Corrosion and heat resistance

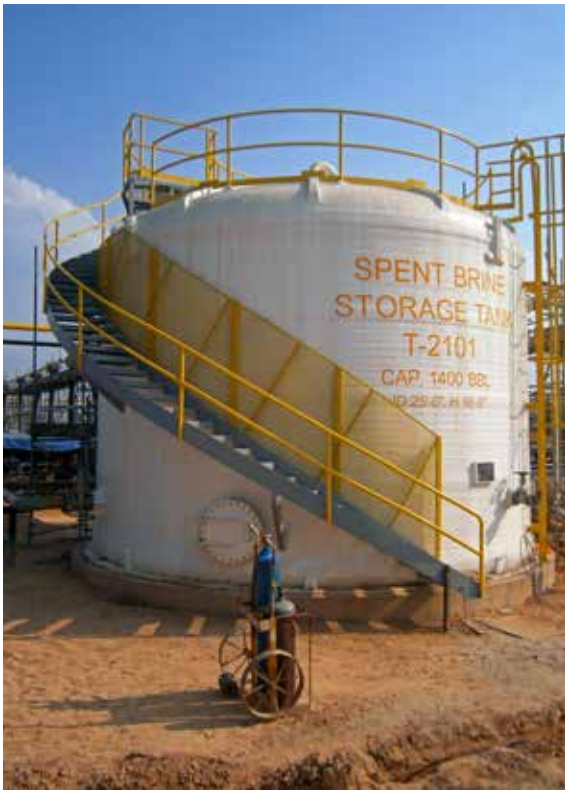
Gunawan Karim of GAJAFIBERGLASS said an effective presentation by Jason Triggs, technical consultant for Nuplex Composites, and a professional and quick response from AOC Corrosion Resin Product Leader Scott Lane secured the resin specification for Vipel technology.

"We verified that Vipel F080 epoxy vinyl ester was suitable for containing brine solution at temperatures up to 210° Fahrenheit (99° Celsius), which is a critical requirement for the tank," Karim said.

About Technip

Technip is a world leader in project management, engineering and construction for the energy industry. The company offers the most innovative technologies for meeting the world's energy challenges. With world headquarters in Paris, Technip is present in 48 countries and all continents. For more information, go to www.technip.com.

GAJAFIBERGLASS team members stand by their work at the installation site.



With the addition of fittings and ancillary equipment, the tank is ready for service.

About Nuplex Composites

Nuplex Composites is a full-service distributor of materials, supplies and technical support for composite manufacturers in the Asia-Pacific region. For more information, go to http://www.nuplex.co.nz.

About GAJAFIBERGLASS

With headquarters in Jakarta, Indonesia, PT. Graha Adhi Jaya Abadi FRP Engineering & Manufacturing, or GAJAFIBERGLASS, has been making engineered fiber-reinforced composites to world-class standards since 1990. End-use application expertise includes tanks, linings, coatings, pipes, fittings, roofs and gutters. For more information, e-mail marketing@gajafiberglass.com or go to www.gajafiberglass.com.

About AOC

AOC is a leading global supplier of resins, gel coats, colorants, additives and synergistic material systems for composites and cast polymers. For more information on AOC technology, quality and service, e-mail corrosionresins@aoc-resins.com, phone (866) 319-8827, or go to AOC-RESINS.com.

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