

# Covering the Antarctic



By Sara Attwood-Jones

## Composite access covers withstand Antarctic temperatures

**A** design and technical team was called on to help an engineering team constructing a specialist wastewater treatment system for a facility in Antarctica.

Living and working in a remote environment such as Antarctica demands careful planning, well-trained personnel and specialized equipment—and this new wastewater system is essential for treating all blackwater and greywater generated on the base before it can be safely discharged into the sea.

“The lead designer on this project came to us very early on with his brief, which was stringent,” said David Holmes, technical director for Fibrelite. “Not only did the specifications stipulate easy access to internal workings, which meant designing a custom cover, but the final geographical resting place for the finished equipment meant that any materials incorporated into the design had to be chemically inert, corrosion resistant and able to withstand extremely low temperatures.”

From the range of sizes and load ratings available, super-light-duty trench covers were selected to provide ready access to the integral workings in this particular situation.

### Cover Design

Designed to be a “fit-and-forget” product, fiber-reinforced plastic composite covers are maintenance free, durable, corrosion resistant and strong. They also are resistant to water absorption and will not allow liquids or gases in or out.

Each cover is manufactured using high-technology resin transfer molding production methods to create a monolithic composite product that provides the strength-to-weight ratio and surface details, including the anti-slip finish, that were essential for these access covers.

This method of production, combined with the

correct fitting, means that Fibrelite can warrant against the structural failure of these composite covers for 15 years from the date of installation.

### Manual Handling

“Rigorous international rules require any base on Antarctica to leave a negligible environmental impact,” Holmes said. “So one of the key drivers of this specification was easy access to the system’s internal workings to allow those engaged within the facility to perform regular maintenance checks throughout its working life and monitor the system’s performance efficiency.”

This also meant the designers were faced with another conundrum: how to reduce risks to personnel during their regular manual handling and lifting of covers in extreme conditions and in one of the most isolated places on earth.

“These covers are lightweight, and a special lifting handle is all that is required for operators to safely remove the covers when required,” Holmes said. “The ergonomically designed lifting aid has the added benefit of eliminating the risk of back injury and crushed fingers.”

This project was an example of how being involved in a prototype application from an early stage can be beneficial to both parties. Fibrelite was able to plan bespoke manufacturing to deliver covers to fit the specific sizes required, while composite covers became an integral part of the client’s design.

It also was an example of why composite covers—initially developed more than 30 years ago for the petroleum industry and fitted as standard on gas station forecourts—now are increasingly specified in both new construction and retrofit work across all major industries. **w&wd**

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