Trade Media Release

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Engineered for impact: polymer piping retrofit supports safe potable water on board hospital vessel *Africa Mercy*

As part of a comprehensive retrofit of its potable water system, the hospital ship Africa Mercy has implemented a polymer piping solution from GF across critical medical areas. The project, supported through a material donation and on-site engineering assistance, demonstrates how thermoplastic systems can meet stringent hygiene and performance requirements in demanding marine environments.

Operated by the international, independent, and donation-based charity Mercy Ships, Africa Mercy (152 m LOA, 16,572 GT) is one of the world's largest civilian hospital ships. It provides advanced medical care to people in sub-Saharan Africa with limited healthcare infrastructure. On board, the vessel features five operating theatres, an intensive care unit, a general ward with 82 patient beds, as well as state-of-the-art diagnostic facilities.

In such an environment, freshwater systems must meet particularly stringent requirements. In addition to withstanding vibration, movement, and saline ambient conditions at sea, they must ensure consistently high water quality in line with WHO drinking water guidelines, especially in surgical and intensive care areas, where water quality directly impacts patient safety. At the same time, aging metallic piping systems can present operational risks. On board Africa Mercy, the existing system had begun to show increasing fouling over time, prompting the need for a reliable and hygienic long-term solution.

Complete system renewal under challenging retrofit conditions

The renewal of the potable water network was carried out as a full retrofit in critical hospital areas across two decks during the ship's dry dock period, covering surgical zones, intensive care units, as well as patient wards and cabins.

As is typical for ship conversion projects, installation conditions were challenging. Time pressure, limited space, complex routing, and the need to work around existing infrastructure required a high degree of flexibility. In this case, parts of the old piping system remained in place while the new system was installed in parallel, adding further complexity to the execution.

Polymer piping solution tailored to marine requirements

For the project, GF supplied a complete thermoplastic flow solution, combining INSTAFLEX (Polybutene) for the main distribution lines and the iFIT (Multilayer-composite) system for connections to individual endpoints such as operating rooms, wards, and cabins.

The INSTAFLEX system, joined via electrofusion to allow a dry-fit positioning for more flexibility, was used for the primary distribution network and designed for a pressure rating of PN16. The iFIT system, with its manual push-fit connection technology and a pressure rating of PN10, enabled an efficient and flexible installation at the final connection to a cabin locker valve. Both systems are certified according to major international standards, including ABS, DNV, LR, BV, and RINA, and are designed for a service life of at least 25 years.

From an engineering perspective, polymer piping offers clear advantages over conventional metal systems in marine potable water applications. The material is inherently corrosion-free, preventing internal scaling and degradation in humid and saline environments. Smooth inner surfaces support hygienic water transport by reducing the risk of biofilm formation, while the absence of taste or contaminant release contributes to maintaining water quality over time.

In addition, the flexibility of polymer materials allows the piping system to absorb vibration and movement of the vessel, reducing mechanical stress and minimizing potential leak risks over its lifetime.

Efficiency gains in installation and handling

The project also demonstrated the installation advantages of thermoplastic systems in retrofit scenarios. Compared to metal piping, installation times were reduced by approximately 50%, supported by modular system design and simplified joining technologies. The electrofusion of INSTAFLEX and the push-fit connections of the iFIT system eliminated the need for hot work, improving safety and reducing complexity during installation. Weight reduction was another key factor. The polymer system is up to 60% lighter than comparable metal solutions, facilitating handling and installation in confined onboard spaces. In total, more than 2,000 meters of piping and over 7,000 fittings were installed.

On-site expertise and reliable implementation

In addition to donating the materials, a dedicated GF team supported the project on site, working closely with contractors and the ship's technical personnel. Their involvement included installation support, technical guidance, and crew training to ensure correct system handling and long-term reliability.

"GF donated the complete freshwater flow solution for the Africa Mercy. And a team of five colleagues contributed our personal time, know-how, and hands-on support during the installation on site, working alongside partners and the ship's crew to ensure a reliable and hygienic system suited for medical operations," says Roberto Chiesa, Head of Business Development Marine at GF.

Supporting safe medical operations at sea

For Mercy Ships, the upgrade represents a critical improvement in operational reliability. "The older piping started to experience significant fouling over time," says Lachlan Davit, Technical Support Officer Marine Operations at Mercy Ships. "Because we are a hospital ship, we operate to a much higher standard. Ensuring consistently clean water is essential for our patients, our crew, and our medical equipment." By enabling a robust and hygienic potable water system, the project helps ensure that Africa Mercy can continue delivering life-changing medical care in regions where access to healthcare remains limited. At the same time, it highlights the potential of polymer piping systems as a reliable and efficient alternative for marine applications, particularly in retrofit projects and hygiene-critical environments.

Find out more about GF's marine Flow Solutions.

Meet our team at Seatrade Cruise Global, 13-16 April, Miami Beach, USA, booth 1377.

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Corporate Profile
With a rich history in industrial innovation since 1802, GF is reshaping the future of Flow Solutions by delivering Excellence in Flow through mission-critical products and solutions that enable the safe and sustainable transport of water and other fluids for Buildings, Industry and Infrastructure. Headquartered in Switzerland, GF employs around 13'300 professionals across 46 countries. In 2025, GF's Flow Solutions business generated sales of CHF 3 billion. GF is listed on the SIX Swiss Exchange.

Pictures

	In addition to donating materials, a dedicated GF team worked closely with contractors and the ship's technical personnel during the retrofit. Source: GF
	A modular system design and simplified joining technologies such as electrofusion enabled a fast installation. Source: GF
	GF supplied a complete thermoplastic flow solution for the ship's potable water system, combining INSTAFLEX and iFIT components. Source: GF