

'Responder 3'

Is this the World's Biggest Plastic Barge?

By MIKE BROWN

Polyline Industries of Western Australia is one of the world's originals in the field of plastic leisure and commercial vessels. Others have jumped on to the bandwagon, but Polyline keeps pushing the technology – extending in type, size and complexity – and maintains a comfortable edge.

It is an edge they established years ago in the underground mining industry when founder David Wilkie realised that the high cost of constantly replacing corroded steel ventilation shafts could be eliminated by using plastic. Now thoroughly established in the marine industry as well, Polyline has produced a string of workboats, oil-spill control vessels and containment barges. The latest vessel is the company's biggest, a 250-tonne-capacity barge. Polyline believe it could also be the world's largest plastic vessel.

The Port Hedland Port Authority has extensive areas of mangrove within its boundaries, and their protection from pollution is a prime requirement. The authority has previously bought Polyline vessels for the task, including a 100-tonne barge. When they were shopping for a major Tier 2 and 3 response vessel, their contractors West Coast Response selected the same suppliers.

Unlike many nominally plastic vessels, apart from some external fittings and couplings the barge is entirely made of plastic – over 70 tonnes of high-density polyethylene (HDPE) – minimising maintenance costs. To make it road transportable Polyline built it in four modules, to be linked on site by 16 chains passing through tunnels and then hydraulically linked by the welding of the overdeck plastic oil transfer lines.

The basis of the structure is eight pipes in four pairs, 1.6 metres in diameter and 21.5 metres long, fitted with roto-moulded end caps. Each is divided into two tanks with a coffer dam between them, and baffles are installed at 600-millimetre centres. Each pair

is decked, the deck supported by a massive substructure in welded sheet plastic – or perhaps plate plastic would be a more descriptive term – that could be taken for steel by the uninformed.

There is no permanently installed machinery; the barge can wait for its call indefinitely without deterioration. When on task, four twenty-foot containers sit on the deck to house boom, lighting and other equipment; a generator and pumps are also deck mounted. Any tank can be selected for filling or pumping.

As a measure of the volume of marine business undertaken by Polyline, the company employs its own naval architect. Tobias Clarke is as hands-on as they come, spending time on the shop floor fabricating and welding. His view is that he is not responsible just for design, engineering and compliance, but also for making the vessel readily buildable – hands-on time attunes him to this.

Tobias comes from an aluminium ship-building background, but quickly became an evangelist for the unique properties of plastics in marine applications. "A primary attraction," he says, "is that it is cheaper than other materials, but the catalogue of advantages is long." He lists the obvious one of complete absence of corrosion, and adds the less well-known property of resistance to marine fouling. "It is so resistant that it is essentially non-fouling."

He goes on to cite excellent resistance to damage – this is an impact-friendly material that sustains and delivers very little harm. Having an in-built memory, polyethylene is inherently impact resistant with most collisions being absorbed in the flexibility of the material, which returns to its original form soon after. Substantial impacts that fracture the hull, and these are serious hits indeed, are generally easily repaired. A related point is that colour is full thickness: not only is no paint applied during construction, but abrasion of whatever depth requires no touching up.



For further information contact:
Polyline Industries, Western Australia.
PH: (08) 9414 1535,
FX: (08) 9414 1452,
Email: cchurchill@polyline.com.au,
Web: www.polyline.com.au

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SPECIFICATIONS

Type of vessel: Dumb barge

In survey to: 2C

Home port: Port Hedland,
Western Australia

Owner: Response Resource
Management, Queensland

Builder: Polyline Industries,
Western Australia

Construction material: High-density polyethylene

Length overall: 21.25 metres

Length waterline: 21.25 metres

Length bp: 21.25 metres

Beam: 13.28 metres

Draught: 1.28 metres

Depth: 2.1 metres

Displacement: 300 tonnes

Hold capacity: 155m³