

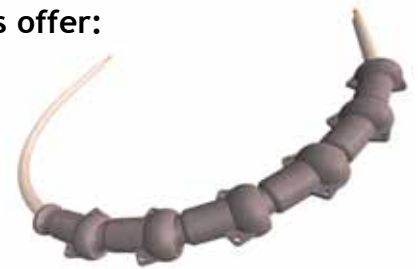
Submarine Cables Protection, *The most important requirement for a sustainable project*

With the support of IBOCS consortium and the participating partners INNOSEA and GEM, FMGC designs, manufactures and supplies the MRE sector with protecting and ballasting shells for submarine cables.

Our solutions are designed and manufactured in accordance with the demand and requirements of the sector.

The cast iron protecting and ballasting shells for submarine cables offer:

- Sufficient weight to stabilize the cables
- A hydrodynamic design
- An increase in the bend radius to match that of the cable and the undersea relief
- A transfer of tensile forces during the installation of the cable
- Sufficient mass for the entire duration of the immersion period (20 years minimum)
- A simple, robust and economical design



During installation the cast iron shells:

- Provide extra support for handling or semi-automation to increase the speed of installation
- Minimize the difficulty level of handling
- Improve workplace safety
- Decrease installation costs

Our ambition is to provide a solution that is:

• *Cheaper*



• *Faster*



• *Safer*



FMGC experience during the test phase in Ushant

After several months of intense collaboration, the IBOCS consortium designed, manufactured and installed 40 m of cast iron shells (réf : IBS-69-88) around a 69 mm in diameter electrical cable attached to the main tidal cable.

Subject to the specific site conditions and the very bad weather (strong storms and tides) the cast iron shells have fully ensured the stability and protection of the electrical cable.



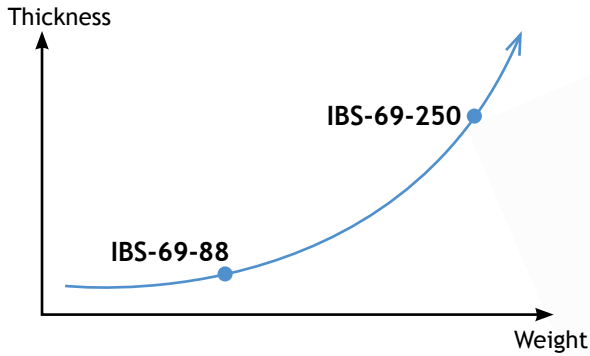
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Expert in ballast solutions

Our shells are suitable for the following business fields:

- Marine Renewable Energy
- Oil & Gas
- Submarine Electricity Transmission
- Telecommunication

... and can easily adapt to your specific requirements:



Specifications

Trading Name	IBS-X-Y	IBL-X-Y
Product Length	428 mm	569 mm
Effective Length	350 mm	500 mm
Inside diameter min / max	40 mm / 320 mm	40 mm / 320 mm
Cable diameter min / max (X)	33 mm / 300 mm	33 mm / 300 mm
Thickness min / max	6 mm / 35 mm	6 mm / 35 mm
Material (standard)	EN-GJS-400-15 (ISO 1083)	EN-GJS-400-15 (ISO 1083)
Yield strength / elongation	400 MPa / 15% elongation	400 MPa / 15% elongation
Weight per segment (air) min / max	7.5 kg / 85 kg	11 kg / 127.5 kg
Weight per meter (air) min / max (Y)	20 kg / 250 kg	30 kg / 380 kg
Minimum bending radius	1.3 m	2 m

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