



FEHRMANN
WINDOWS

Safffety first.



fff Reinforced ship windows



ffforward thinking.

From the worldwide quality and innovation leader for pressure-tight windows comes an innovative new window that is popular with shipyards, designers and shipowners alike. fff reinforced ship windows are only installed in the vessel's hull once the "hot works" are finished. This eliminates various time-consuming and cost-intensive problems. The fff windows are much stronger and lighter than conventional products, which reduces unladen weight and also saves a good deal of ballast in the keel. That's why people trust Fehrmann windows wherever it matters: On the extremely seaworthy lifeboats of the legendary German Maritime Search & Rescue Service (DGzRS) for instance, which are equipped to cope with heavy weather. On police boats and navy vessels with the maximum safety standards, where no one can risk a mistake. At trials for naval standards (MIL-S-901 & MIL-STD-167) with shock and vibration tests, where the windows were subjected to more than ten times the Earth's gravitational acceleration, they fulfilled all the requirements. fff reinforced ship windows keep freak waves and polar bears out – and the costs down! Saffety first pays off for project managers and for private and state-owned shipping companies alike, whether it's a new vessel being built or a refit.

fff + 600% saffety
The patented fff window system is guaranteed to be up to 600% stronger against failure than ISO 3903 windows. And in the unlikely event that something goes wrong, no screwheads can break off the frame and injure people, for the simple reason that there are no screws.

fff - 80% installation
The clamping system developed in-house cuts installation costs by an average of 80% and makes installation considerably easier.

fff - 85% upgrade costs
fff is the only system on the market to enable simple replacement or an upgrade of the complete windows while a vessel is in service, without any hot works.

fff - 70% risk
The fff window system reduces the risks of damage and delays as → it is installed without hot work and after all hot works have been completed, → it is fitted in a single step (frame and glass), and → can be installed flexibly depending on the progress of construction.

Building more ffflexibly.

We've always built the best windows in the maritime world, and we've headed the German Industrial Standard's ship-window committee since it was founded over 50 years ago. So it's no surprise that we know how to develop and manufacture high-performance windows that cut costs, avoid risks and save time.

For proof, check out this direct comparison:

Cost example fff vs. welded frame:

Comparison of the time taken to fit a 1400 x 1600 mm window with a welded frame versus an fff window of the same size:

	Hourly rate	Minutes	fff Costs	Minutes	welded frame Costs
Fitting					
Without preparation time on board	70.00 €	20	23.33 €	90	105.00 €
After fitting					
Sanding welded joint	70.00 €	0	0.00 €	20	23.33 €
Treating with primer	70.00 €	0	0.00 €	10	11.67 €
Painting	70.00 €	0	0.00 €	10	11.67 €
Total working time / total costs per window					
		20	23.33 €	130	151.67 €
Total working time / total costs per set of 30 windows					
		600	700.00 €	3,900	4,550.00 €
Risk of broken glass / damage (assuming 3% of a set of windows)					
Glass price approx.			0.00 €		1,500.00 €
Material overheads approx. 10%			0.00 €		150.00 €
Time needed to remove the old pane of glass on board		0	0.00 €	420	490.00 €
Working time / costs incl. broken glass / damage per set of 30 windows:					
		600	700.00 €	4,320	6,690.00 €
Hours saved per set of windows:				62	
Cost saving in euros per set of windows					about 6,000.00 €

Preparation times, alignment of the welding gun and drying times between priming and painting not included.

fff The windows are fitted in a single step, thus minimizing the risk of broken glass.

fff The frame cannot bend or warp, as there are no hot works involved.

fff The fff window has a fairly low weight compared with a welded frame.

fff fff windows are made of lightweight aluminum; thanks to the clamp system, they are perfect for fitting into steel bulkheads too.

fffabulous idea.

Satisfied Fehrmann customers the world over agree.

And buyers and planners wonder why they didn't use fff windows before. With fff windows, you benefit on all fronts: you save time, avoid unforeseen changes of plan and unforeseen costs.

The customer can rely on a tried-and-tested system with clear planning and costs. So when you're planning new construction, use fff!

And when refits are called for, swap conventional windows for fff.

The motto is: Saffety first!



- fff**
- no welding or drilling
 - higher tolerances acceptable on window openings
 - large selection of frames and glass
 - maximum visibility – thinner window mullions possible
 - without black border on the glass
 - with or without corner radius

- fff**
- complies with all relevant rules and regulations
 - no screwed joints – no corrosion
 - less danger of injury in the event of damage
 - manufactured and tested in compliance with ISO 3903
 - patented



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Fehrmann is the world's no. 1 expert for pressure-tight windows for shipbuilding, plant construction and civil engineering. Our windows are custom-made special products at the highest safety level, suitable for extreme demands like flood protection, protection against driving rain and high winds, and resistance to freak waves. They comply with all standards and certifications, impress with their quality and durability, and are used worldwide in unique special vessels as well as in special plants and buildings.

One example of the latter is the famous concert hall Elbphilharmonie at our home base, the maritime city of Hamburg.

