

Maritime Connecting Solutions



Range of applications



NORMA® FGR

- Black and grey water
- Fresh water
- Ballast lines
- Bilge water
- Sprinkler systems
- Discharge lines
- Charged air lines
- Lubrication lines



NORMA® TORRO®

- Hydraulic lines
- Lubrication lines
- Cooling lines
- Compressed air lines



NORMA® Cable Cleats

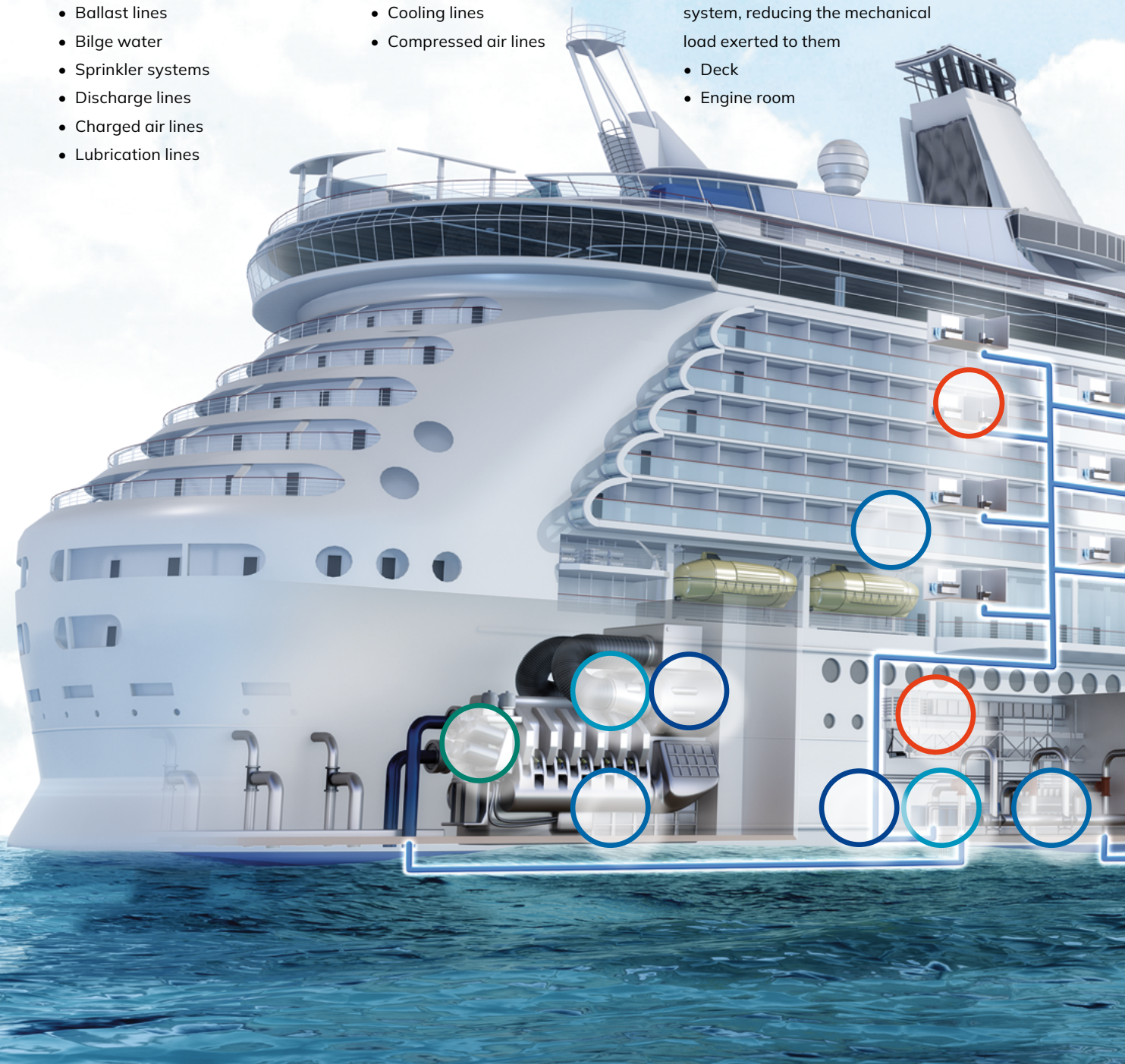
Support and retain the cables and conductors within the cable tray system, reducing the mechanical load exerted to them

- Deck
- Engine room



ABA® Original

- Cooling lines
- Technical water





SMO

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NORMA® RSGU

- Supply lines
- Communication wires



NORMA® GBS

- Hydraulic lines
- Lubrication lines
- Cooling lines
- Compressed air lines



NORMA® Stainless Steel Ties

- General fixing

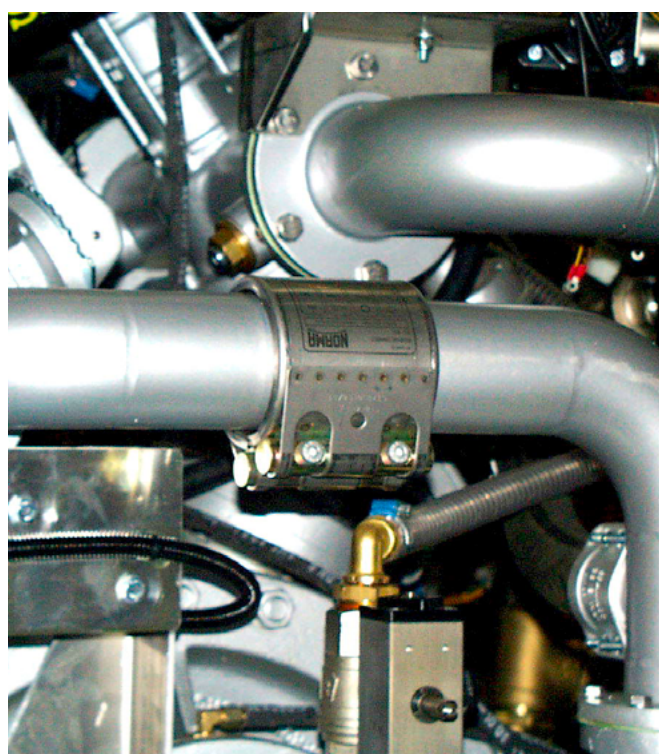
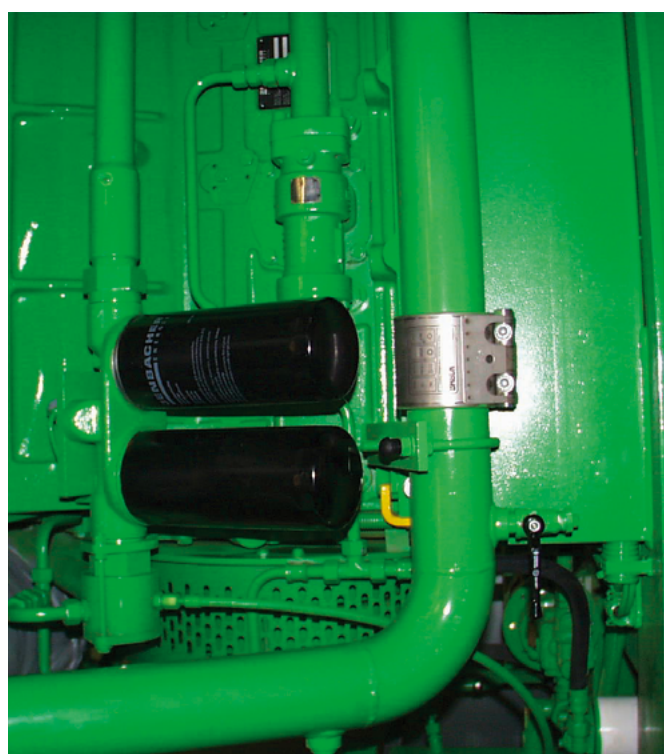
Superior connecting solutions for shipbuilding **NORMACONNECT® FGR pipe couplings**

For decades, NORMA Group has been a well-known partner for connecting solutions in the shipbuilding business for cargo vessels, container ships, RoRo-boats, passenger vessels and special supply and navy ships.

Our best-selling product range in this industry, FGR, provides the perfect coupling for all kind of welding free connections with a versatile choice of pipes (black steel, stainless steel, plastic, copper and copper nickel) meeting the international standards for shipbuilding according to IACS and other national approval authorities. FGR couplings guarantee compensations of pipe tolerances and dampens vibrations.

FGR pipe couplings are a compact, economical and reliable means for connecting plain-ended pipes. They are suitable for joining plastic and metal pipes and especially pipes made from stainless steel.

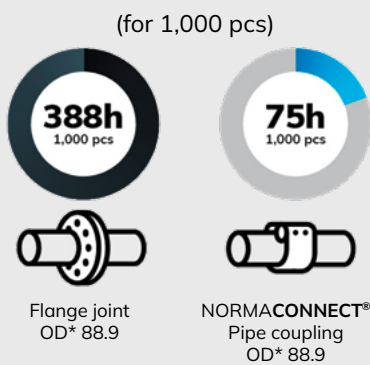
Supply pipes as well as exhaust pipes for solid, liquid or gaseous media can be joined easily and safely in a very short period of time even in narrow spaces. Thanks to the wide range of various types and sizes they are suitable for use both in standard and specialized applications.



Compact, economical and reliable range NORMACONNECT® FGR benefits

✓ Time saving

- No welding
- No necessity for prior pipe alignment or treatment of pipe ends
- Up to 80% time saving
- Cost effective alternative



✓ Compensation of pipe tolerances

- Compensates for pipe gaps up to 65 mm
- Compensates for axial movements up to 7.5 mm
- Compensates for misalignment up to 3 mm

✓ Angular deflection

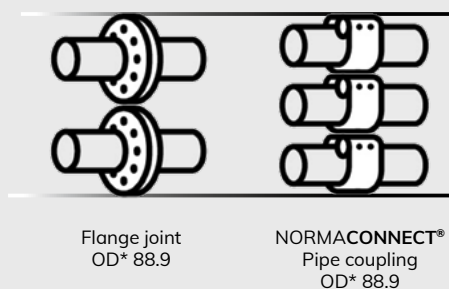
Compensates for angular deflection up to $\pm 2^\circ$ in total

✓ Practical use

- Detachable connection
- Re-usable

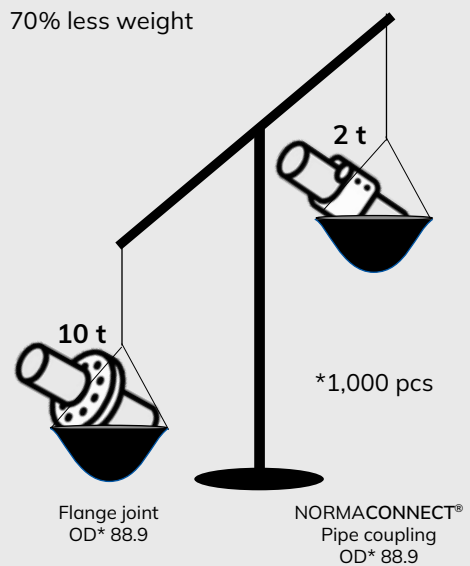
✓ Space saving

- Requires less space than conventional joining methods like flanges
- Can be installed in areas which are hard to access



✓ Weight saving

70% less weight



Excellent coupling for all kinds of welding free connections

Connected pipes			Metal + metal		Plastic + plastic		Metal + plastic		Repair of metal or plastic
Axial non restraint									
Type	Flex 			180.0 - 1,219.2 mm	26.9 - 168.3 mm	180.0 - 1,219.2 mm	26.9 - 168.3 mm	180.0 - 1,219.2 mm	
Material	W2, W4, W5								
Material sealing sleeve	EPDM, NBR		16 - 3 bar	16 / 10 bar	16 / 10 - 4 bar	16 / 10 bar	16 / 10 - 4 bar		
Type	Flex E 		26.9 - 168.3 mm	180.0 - 1,219.2 mm	26.9 - 168.3 mm	180.0 - 1,219.2 mm	26.9 - 168.3 mm	180.0 - 1,219.2 mm	
Material	W2, W4, W5		16 bar	13.5 - 2 bar	16 / 10 bar	16 / 10 - 4 bar	16 bar	16 / 10 - 4 bar	
Material sealing sleeve	EPDM, NBR								
Type	FlexGrip E'' 		26.9 - 168.3 mm	180.0 - 406.0 mm					
Material	W2, W4, W5		16 bar	10 - 2 bar					
Material sealing sleeve	EPDM, NBR								
Type	REP E								35.0 - 1,219.2 mm
Material	W5								
Material sealing sleeve	EPDM, NBR								16 - 4 bar

RA	RA 26,9 - 168,3 mm	RA > 180 mm
EPDM	-30 °C - +125 °C	-20 °C - +80 °C
NBR	-20 °C - +80 °C	-20 °C - +80 °C
FKM	max. 150°C steam max. 180°C technical liquids	

Available certifications



ABS



Bureau Veritas



DNV



LRS



RINA

		Metal + metal		Plastic + plastic		Metal + plastic		Repair of metal or plastic
Axial restraint								
Grip 			180.0 - 406.0 mm					
W2, W4, W5								
EPDM, NBR, FKM			16 - 4.5 bar					
Grip E 		26.9 - 168.3 mm	180.0 - 406.0 mm					
W2, W4, W5		16 bar	10 - 2.5 bar					
EPDM, NBR								
CombiGrip							200.0 - 406.0 mm	
W5							16 - 6 bar	
EPDM, NBR								
CombiGrip E						38 - 168.3 mm		
W5						16 / 10 bar		
EPDM, NBR								
PlasticGrip					200.0 - 406.4 mm			
W5					16 - 6 bar			
EPDM, NBR								
PlasticGrip E			40.0 - 168.3 mm					
W5			16 / 10 bar					
EPDM, NBR								

 Flame protection available

* See type approvals for maximum dimension and pressure ratings

** Metal = Grip side, Plastic = Flex side



Maritime Connecting Solutions

In recent years, the shipbuilding industry has become increasingly important as both global maritime trade and sea tourism have continued to grow.

Shipyards world wide are using NORMA Group products for applications such as ballast lines, freshwater, seawater, oil, scupper and lubrication lines.

Discover more: normagroup.com

NORMA Group is a global market and technology leader in engineered joining technology, offering more than 40,000 product solutions for diverse applications (automotive, shipbuilding, aviation, infrastructure, etc.). As a listed company, NORMA Group has its headquarters in Maintal near Frankfurt/Main, serving customers in over 100 countries worldwide.

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