



NOVEMBER 2022

COUPLINGS & ACCESSORIES UPDATE

by Aitor Rioja
Sales Manager
Piedmont Pacific



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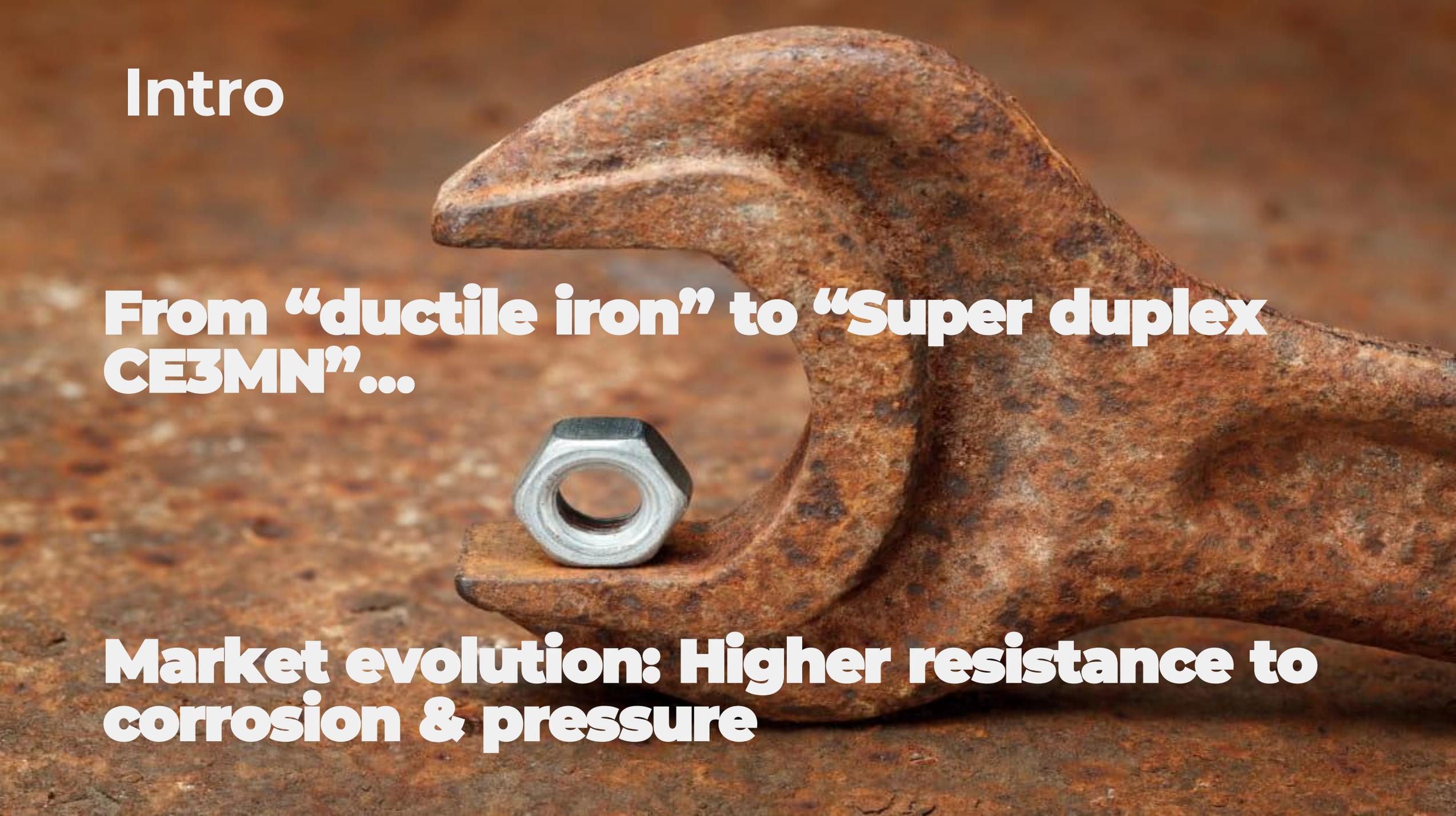




Intro

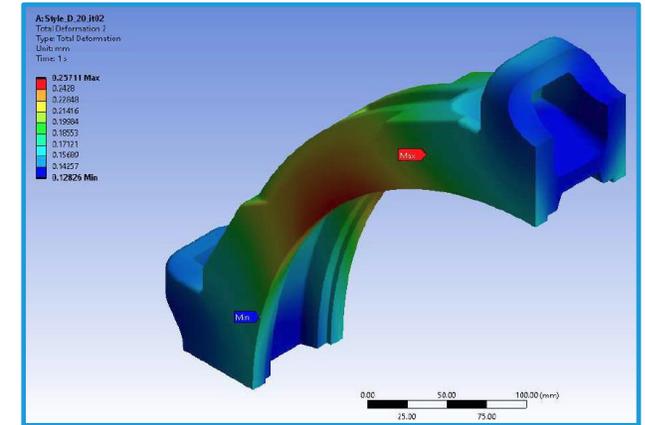
**From “ductile iron” to “Super duplex
CE3MN”...**

**Market evolution: Higher resistance to
corrosion & pressure**

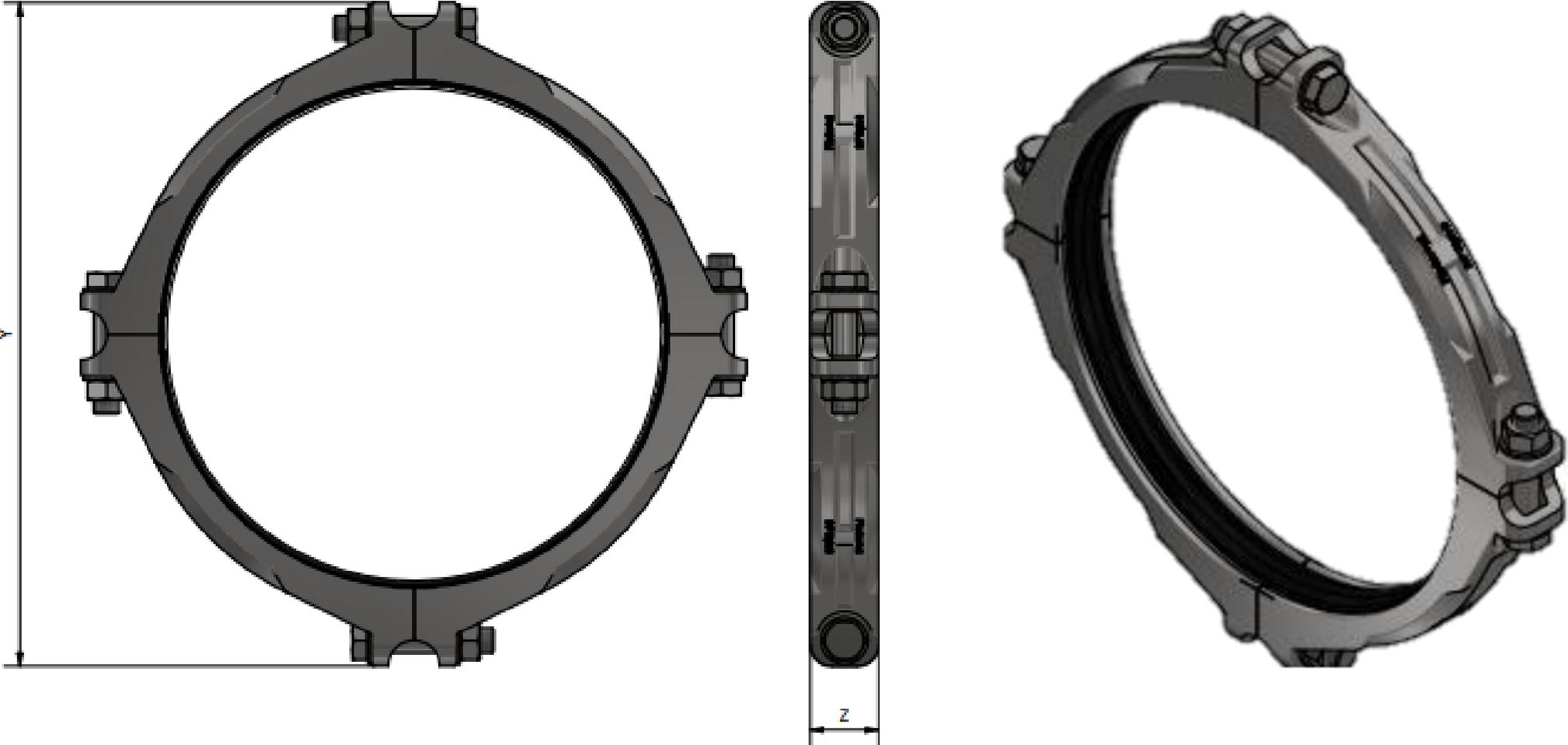


Big diameter couplings & end caps

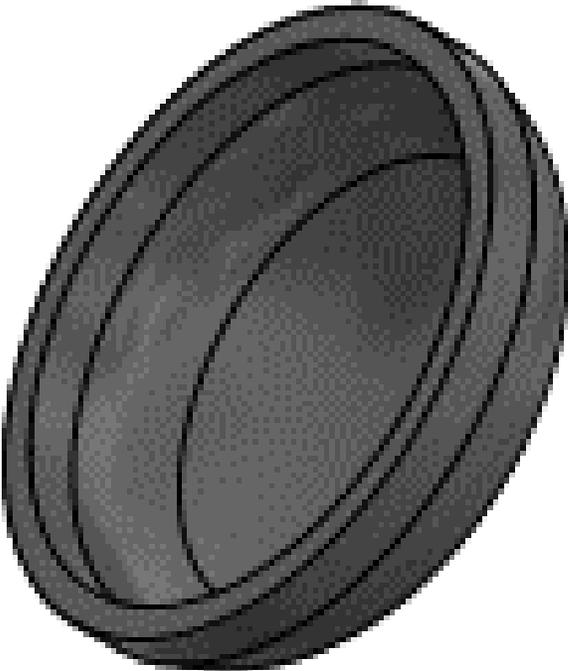
- Style D for 1,200 psi
- Available sizes:
 - 16" & 18" – 3 casting pieces
 - 20" & 24" – 4 casting pieces
- Duplex hardware required
- End caps matching the sizes



Big diameter couplings & end caps



Big diameter couplings & end caps



Couplings: Style H

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Couplings: Style H

- Flexible grooved coupling for ultra high-pressure applications (UHP).
- Specifications:
 - Design pressure: 2000 psi (137,9 bar)
 - Sizes: 1", 1'5", 2", 2'5", 3" & 4"
 - Housing: Duplex (CE8MN) & Super Duplex (CE8MN & CE3MN)
 - Gaskets: EPDM NSF approved. C-shaped or Flush-fit
 - Hardware: Duplex 2205, Super Duplex 2507, SS316
 - Applicable for **schedule 80s** pipes (or heavier)

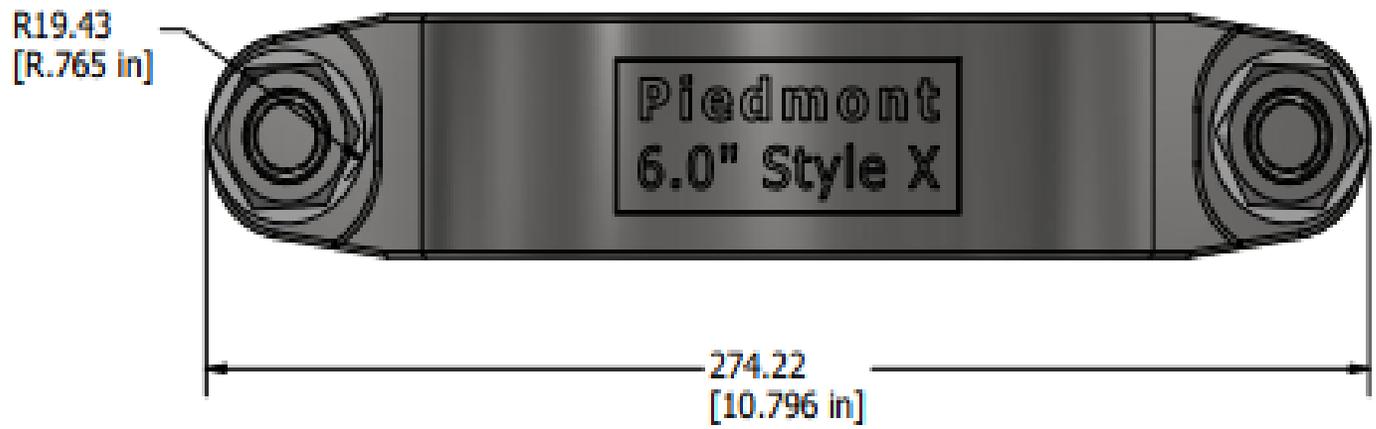


Couplings: Style H

- Buyers & applications:
 - Fedco for turbocharged UHP apps.
 - Protec Arisawa for 2,000 psi RO vessels
 - Zero Liquid Discharge applications
 - R&D Companies
 - Hydrotesting – One Style H will withstand several hydrotest for lower pressure couplings



Couplings: Style X



Couplings: Style X

- **Why?** To be installed on the Dual Work Exchanger Energy Recovery (**DWEER**) side instead of using the D6.0 model.
- **Specifications:**
 - **Design pressure:** 1500 psi (103 bar)
 - **Size:** 6"
 - **Housing:** Duplex (CE8MN) & Super Duplex (CE8MN & CE3MN)
 - **Gaskets:** EPDM NSF approved. C-shaped or Flush-fit
 - **Hardware:** Duplex 2205 or Super Duplex 2507



Couplings: Style X

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Oil & Gas / Offshore applications

- Applications:
 - Floating production storage and offloading (FPSO)
 - Oil field water injection
 - SWRO plants for petrochemical companies
- Requirements:
 - Highest grade MOC:
 - Super Duplex CE3MN for housings
 - Super duplex 2507/ Zeron-100 bolts
 - Fluoroelastomer – Viton gaskets
 - Special coatings: Housings & bolts
 - Special quality tests
 - Certifications (3.2 certification – Third party inspection)



Piedmont capabilities for Oil & Gas projects:

- Manufacturing compliance according to different standards (Norsok)
- Selection of **coatings**: Painting, Xylan, Gleitmo 615,...
- Special quality **tests**:
 - Positive Material Identification (PMI)
 - Corrosion test ASTM G48
 - Metallographic
 - Liquid penetrant
 - Impact test
 - Tensile testing
 - Proof load testing
 - Bolts coating tests
 - Hardness
 - X-ray



Oil & Gas // Offshore references

Supply Year:	Project:	Installation country:	Customer:	Remarks	For Couplings Style & Size (*):
2022	QATARGAS - North Field East Project Onshore LNG Facilities - Desalination Plant - Ras Laffan	Qatar	Acciona / CTJV	Duplex 2205 (S32205) bolting	K0300, DS0300, FS0400, P0600
2022	PETROBRAS FPSO MARECHAL DUQUE DE CAXIAS (MERO 3 PROJECT) - TOPSIDES MODULE P70	Brazil (Offshore)	Veolia VWS Westgarth UK	Duplex 2205 (S32205) bolting	D0250, K0100
2021	ADOC - EPC FOR SURFACE FACILITIES HAIL OIL FIELD WATER INJECTION PROJECT (WIP) - SRP	UAE	Cameron SLB / Petreco Int.	Duplex 2205 (S32205) bolting	FS(3)0100, DS(3)0250, Tee 1" (TC0100-SD(3))
2021	LIZA-UNITY-FPSO (Ship Spare in transit)	Singapore	ACASALES Tech	Duplex 2205 (S32205) bolting	D0250, K0100
2021	ONGC Cluster-II FPSO Project KG-DWN-98/2 - UF & RO systems [VME, Bumi Armada, Shapoorji Pallonji O&G]	INDIA (Offshore)	ATS Water Tech. (Vietnam)	3.2 certification (SGS-GIS)	DS0150, DS0200, FS0150, FS0250, FS0400, Endcaps
2021	BP Mad Dog 2 project - ARGOS FPU	USA (Offshore) (Gulf of Mexico)	Veolia VWS Westgarth UK		DS0100, DS0250, DS0300, D0250, D(3)0250, D(3)0300, Endcaps
2021	VWTKSA Shanghai Electric project - Dubai	UAE	Veolia MPP Systems	NBR Nitrile gasket	K0600
2021	LIZA-3 Prosperity FPSO (Seawater Treatment Package) - SBM - ExxonMobil	Guyana (Offshore)	Veolia VWS Westgarth UK	Duplex 2205 (S32205) bolting	D0250, K0100
2021	PETROBRAS FPSO Anna Nery - Marlim fields development - Yinson	Brazil (Offshore)	Veolia VWS Westgarth UK	Duplex 2205 (S32205) bolting	D0250, K0100
2021	PETROBRAS Sepetiba FPSO (Santos Basin - Mero Field) - SBM - Seawater Treatment Package	Brazil (Offshore)	Cameron - Schlumberger	3.2 certification (BV). Coated Super Duplex 2507 (S32750) bolting.	DS(3)0250, FS(3)0100, Tee 1", Nipples/Pups
2020	Thai Oil Clean Fuel Project - WTP - Wabag	Thailand	Geofluid Processors (India)		L0150, L0200, L0250

Coating



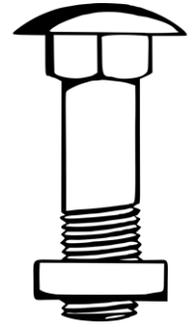
Coating



- **For couplings**
 - Paintings: Epoxy primer & polyurethane coating
 - Best painting procedure for optimum coating.
 - Scale 10 of 10 in tests.
- **For hardware kits:**
 - Painting: Xylan 1424 (for Cameron)
 - Antigalling – Gleitmo 615 (similar to Molykote)
- **Why?**
 - To improve corrosion resistance
 - Lubrication
 - Antigalling
 - Higher visibility
 - Chemical attack resistance



Duplex & Super duplex hardware



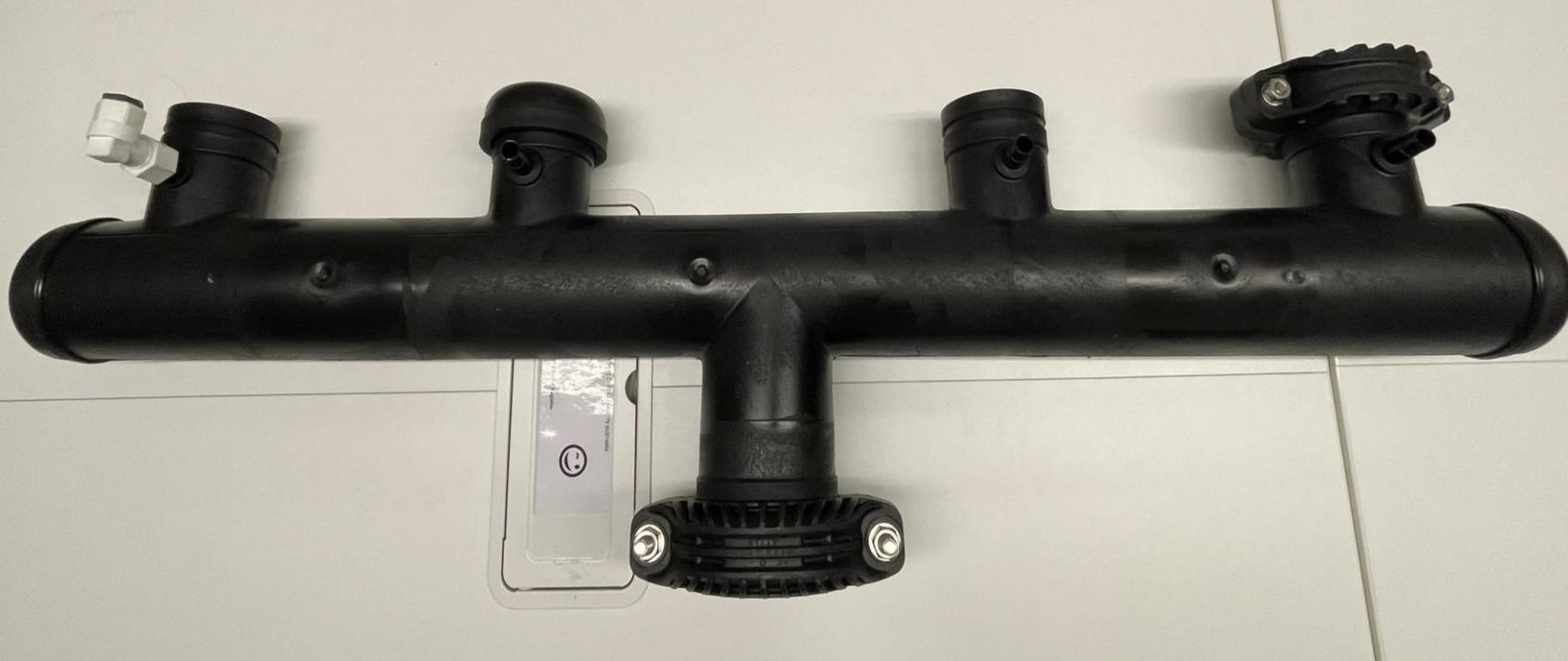
- **Main issues:** Crevice corrosion & Stress cracking corrosion
- **Materials:** Duplex 2205 & Super Duplex 2507
- **Years of research. Previous problems:**
 - Incorrect heat treatment.
 - Problems with microcracks when cold forming the bolt head.
- **Tested by independent laboratories, guaranteed quality.**





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Spools



Spools

- Spools for UF
- Project coming from H2O Innovation
- Injection system instead of welding
- Thousands of dollars saved despite mold investment.

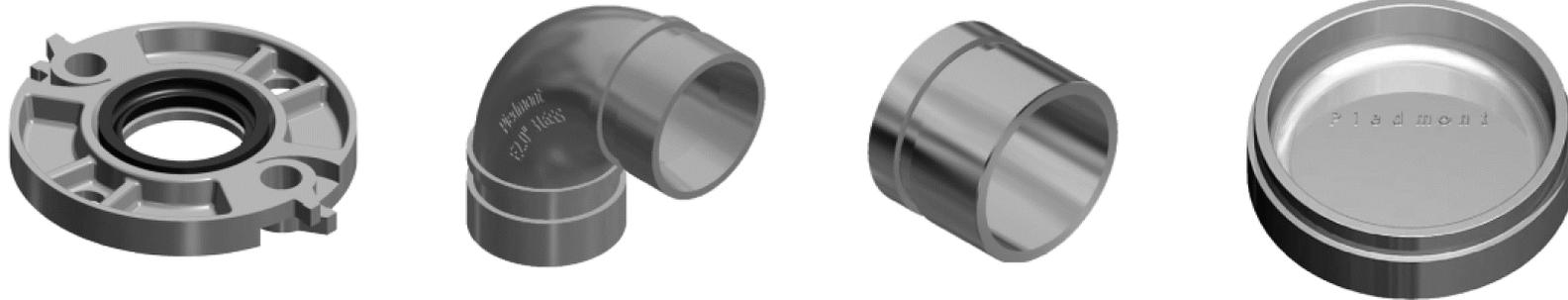


Accesorios

- Current accessories:

COMPLEMENTARY PRODUCTS

FLANGE ADAPTER / ELBOWS / PIPE SPOOLS / END CAPS

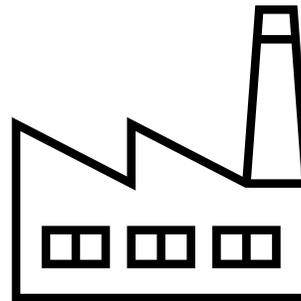


- Special mention: Forged endcaps in Super duplex S32750 for brine part of RO.
- What else shall we include?



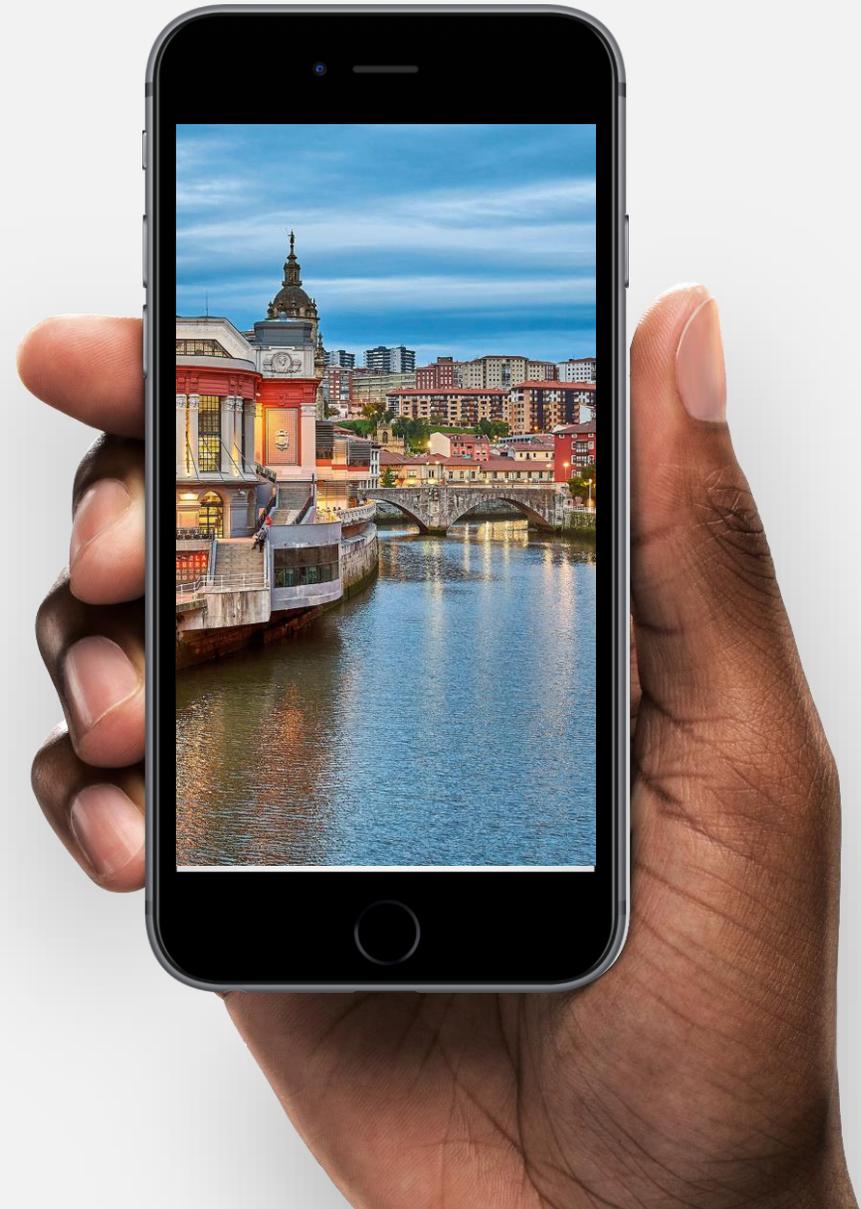
Looking for more suppliers

- Mitigate the geopolitical risk of having one supplier
- India foundry – first tests going well



EventMobi

- What do you miss?
- How can we help?



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WATER COMPANY
OF THE YEAR 2020

