






*Usage of 1" ~160" GRP-RTR-RPM-GRE Piping Systems
in UG, AG, OG, Under Sea and Jacking Applications for
Pressure up to 3000 Psi*



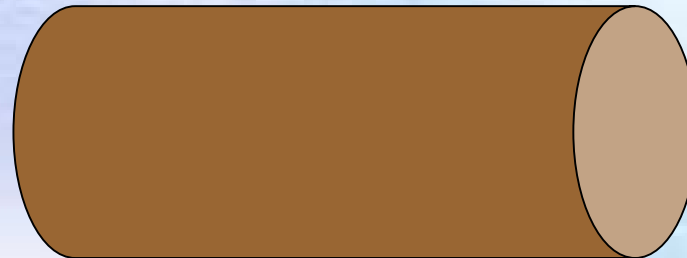
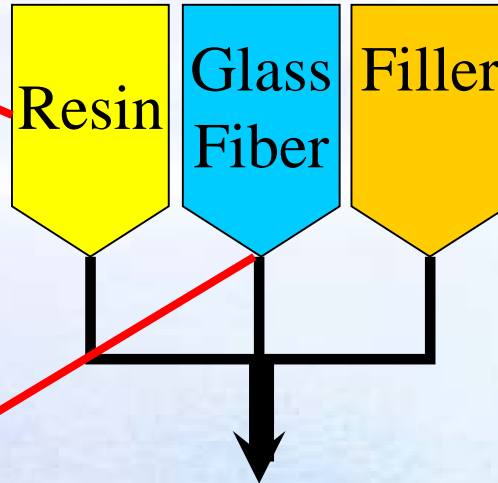
Table of Contents

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Nomenclature

Fiberglass Reinforced Plastics-Pipes
GRP or RTR or RPM or GRE or FRP

FRP-Pipe Wall Construction



FRP-Pipe Wall Construction



FRP-Pipe Wall Construction

Resin

- Provides Hardened shape & Smoothness
- Controls Fiber Reinforcement Orientation
- Provides Corrosion Resistance,
- Heat Resistance and Flame Resistance

Reinforcement

- Strengthens the Resin
- Provides Overall Mechanical Properties

Filler

- Inert Material
- Provides stiffness-more vertical load capacity



Nomenclature

Fiber Reinforced Plastics (FRP)

FRP Fiberglass Reinforced Plastic (or Polyester)
or Fiber Reinforced Plastic (or Polyester)
(European Standards)

GRP Glassfibre Reinforce Plastic (or Polyester)
(BS Standards)

RTRP Reinforced Thermosetting Resin Pipe

RPMP Reinforced Plastic (or Polymer) Mortar Pipe
(American Standards)

FRE Fiberglass Reinforced Epoxy

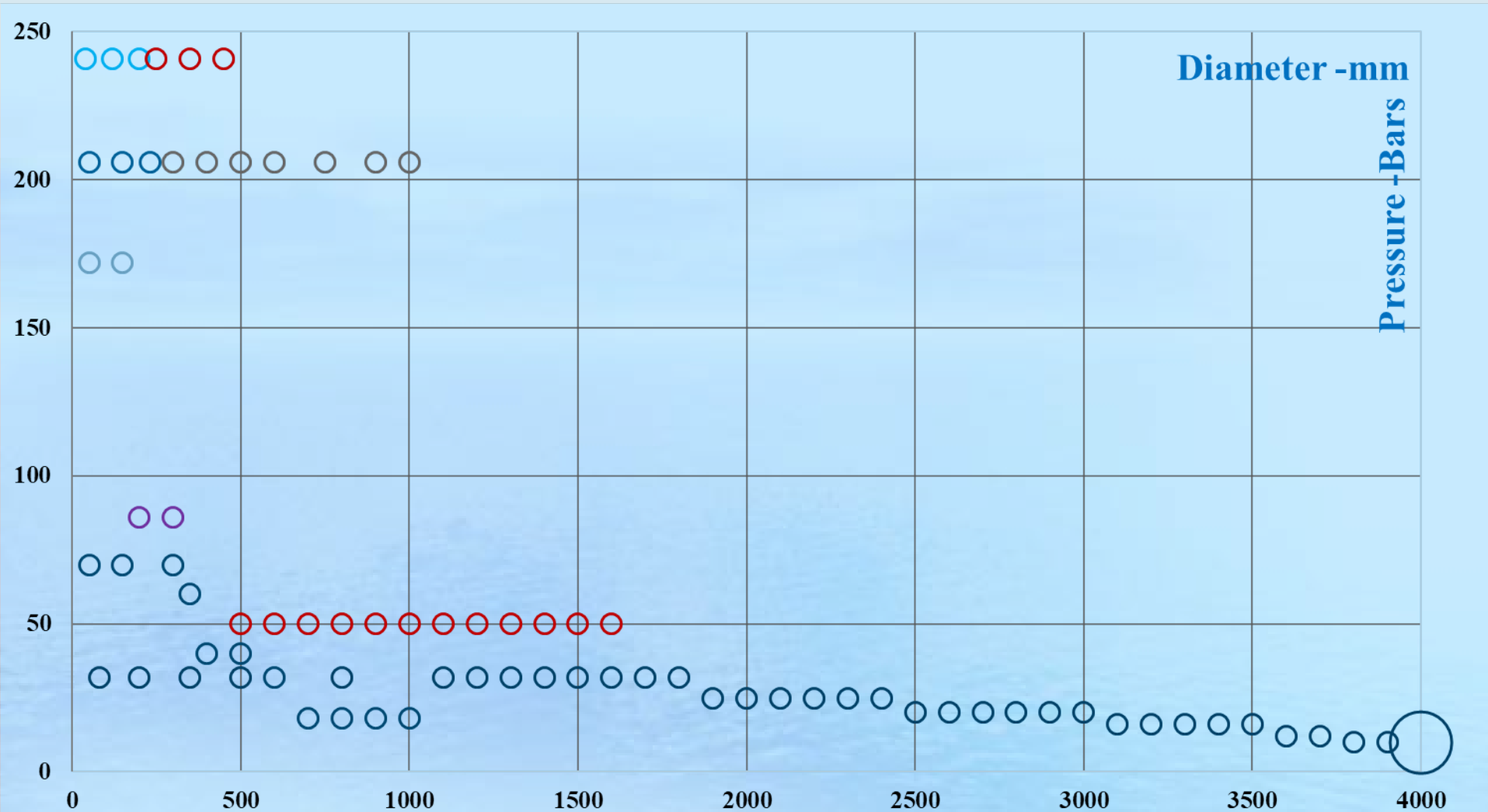
GRE Glassfibre Reinforced Epoxy

Usage of FRP based on Resins

Properties	FRP/GRP/RTRP/RPMP FRV/GRV/RTRV/RPMV	FRE/GRE RTRE/RPME
Resin	Polyester / Vinyester	Epoxy
Temperature	Up to 65 °C / 90 °C	Up to 150 °C
Pressure with Full Vac	0 to 600 Psi	0 to 3500 Psi
Can Handle	All-Moderate Corrosive Fluids	All-High Corrosive Fluids

Diameter Vs Pressure

World Wide GRP-RTR-Pressure Vs Diameter



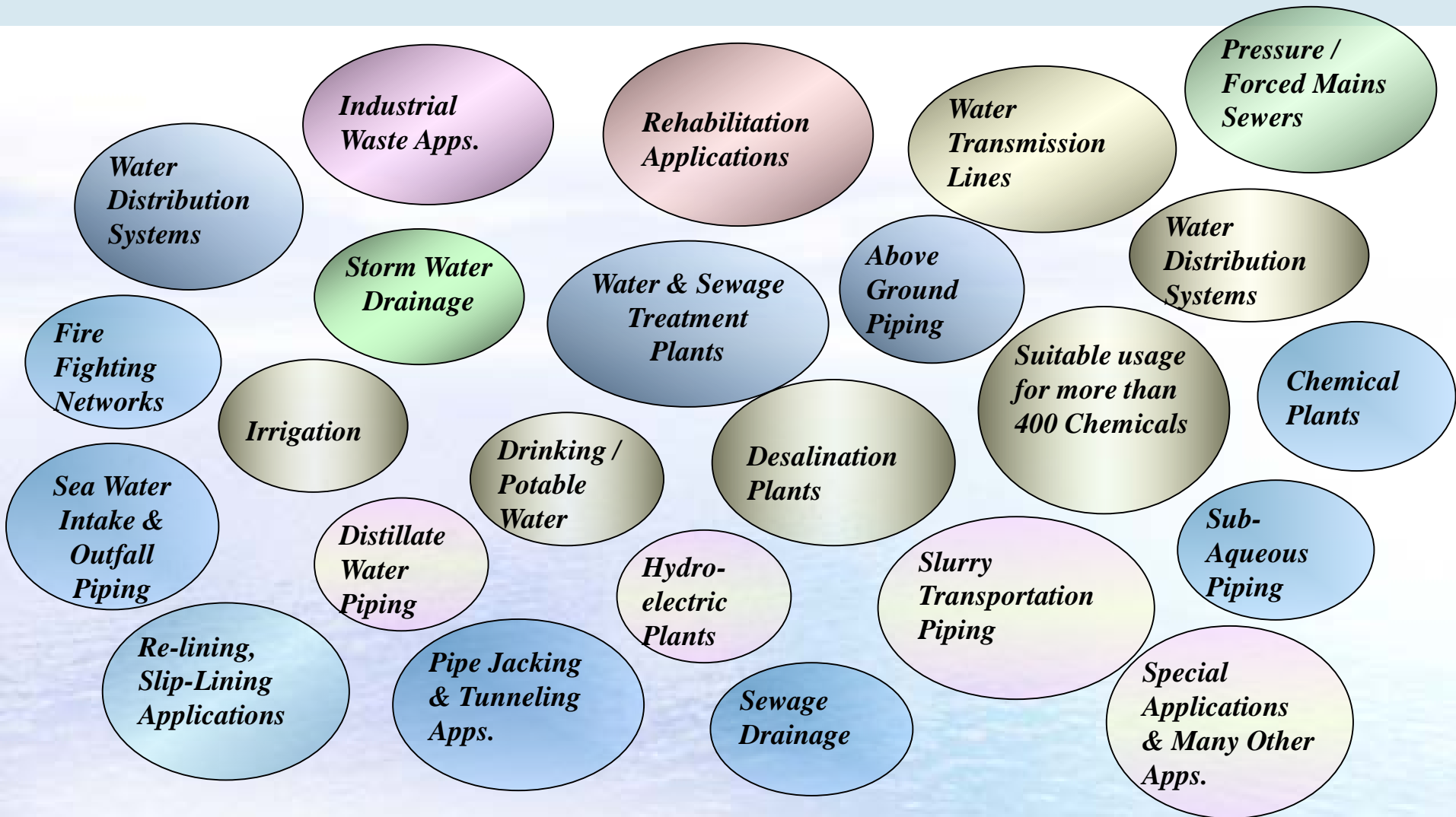
GRE Pressure Piping Range – Oil and Gas



Estimated Total and Yearly GRP/GRE Production

Description	GRP-GRV	GRE
Total Till to 2018 - Km	143900	68859
Yearly Production-Km	3509	929
GRP-GRV-Estimate based on average diameter of 900 mm		
GRE Estimate based on Average Diameter of 200 mm		








Application of GRP-RTR





Structural Applications

GRP –RTR – Structural Application

-  **Under Ground**
-  **Above Ground**
-  **On Ground**
-  **Slip Lining-Jacking**
-  **Under-On-Above Sea**
-  **Pre Insulated Piping**
-  **Deep Well Casing -Tubing**

Under Ground





Gate 2 ind-water 12

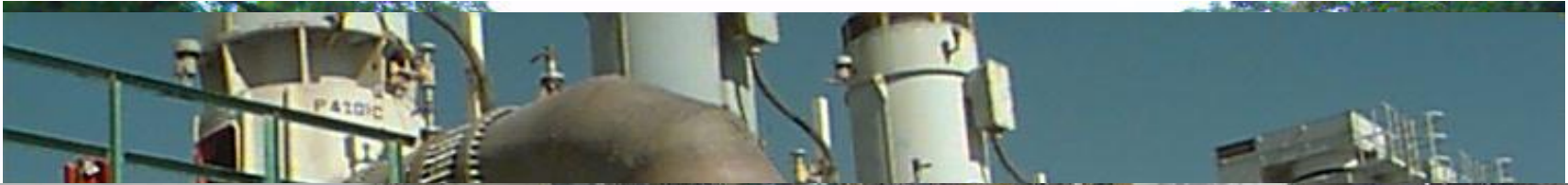




.650 km



📁 Above Ground







 **On Ground**







Slip Lining- Jacking







 **Under-On-Above Sea**





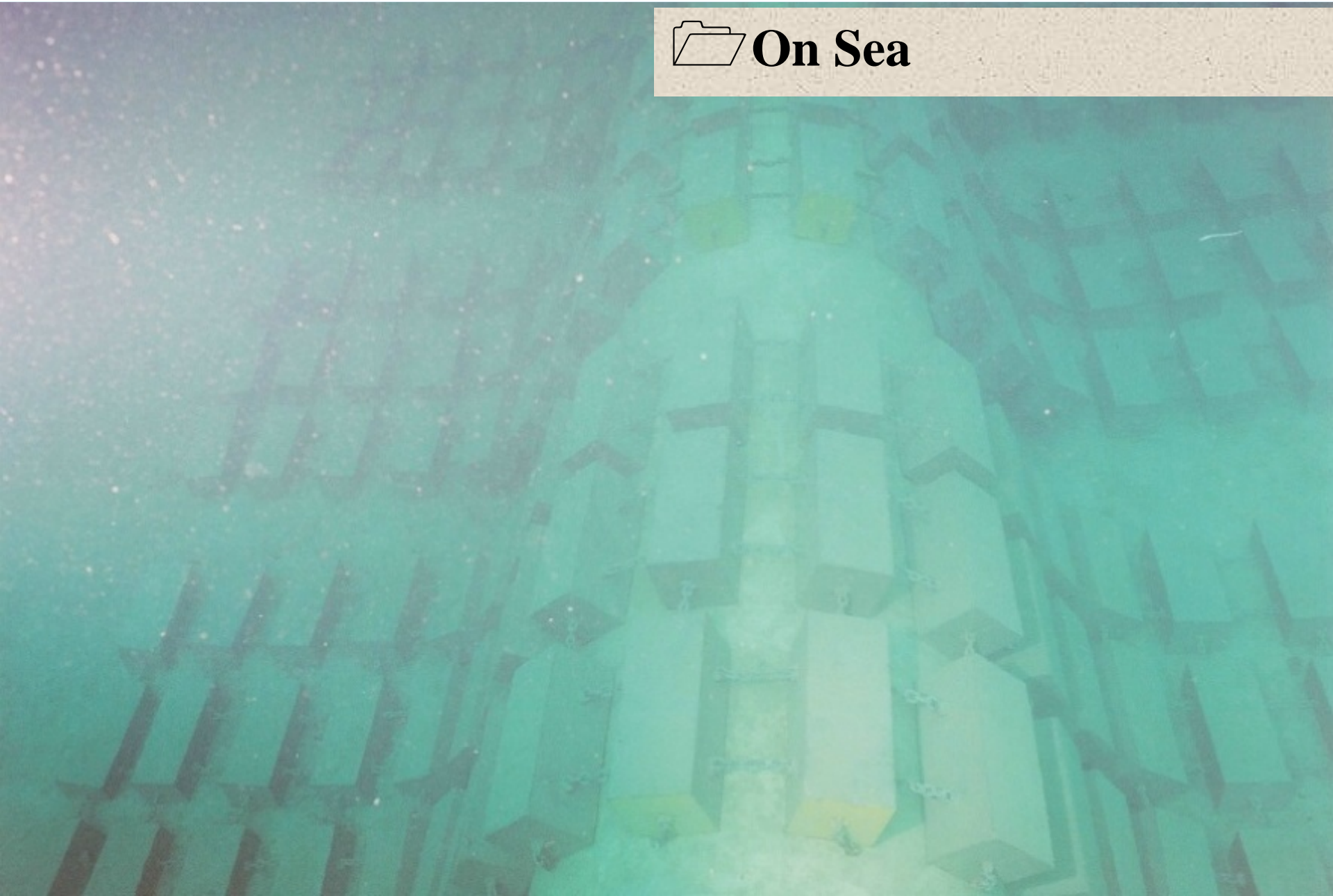


Above Sea





On Sea



 **Pre Insulated Piping**





Poroduct Summary

- Temperature -40F to 200F
- Aromatic Amine Cured Epoxy
- Integnral Seal Loc with 2 Nylon Locking Keys with or with out Sealing O Rings
- Nominal Pipe Lenght of 9.14 m
- DN 100 to 600 mm Diameters



Conclusions and Recommendations

- GRP –RTR is widely used in Middle East
- It is used in all types of Applications
- It is suitable for All Pressure up to 3000 Psi
- Good performance since 1977



Thank You