



SUN SEA GRP PTE LTD

10 Anson Road #30-18 International Plaza Singapore 079903

Tel : (65) 8023 6524 email : sunseagr@gmail.com

Website : www.sunseagr.com

FRP / GRP DUCTS / PIPES FITTINGS





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FIBERGLASS DUCTS / PIPES / FITTINGS

SUN SEA focus on fabrication of fiberglass corrosion resistant ducts, pipes and fittings that are designed to last, which are important to reduce the downtime required for repairs and replacements.

FRP / GRP ducts, pipes and fittings can be used in various industries, normally widely used in chemical, oil petroelumn, pharmaceutical, general manufacturing, governmental sectors and even commercial and public housing. Especially useful for any corrosive environment or in the case if flexibility is required during installation or during the planning of the pipeworks.

For better control of temperature range, FRP / GRP ducts, pipes and fittings are also used as insulated pipes to transfer hot or cold water from one point to another. Due to the nature of fiberglass and corrosion resistance toward chlorine, such insulated pipes are longer life, easier to maintain and easier to repair as compaired to copper pipes, PVC pipes or at some situations stainless steel pipes. Insulation are chosen based on required controls of temperature.

SUN SEA's fittings are designed to suit the pipes / ducting recommended and there are various kinds of connections available.

Some advantages of FRP / GRP pipe / duct or fittings are

- a) Customisation as can be fabricated to different length, shape and sizes
- b) Durable as high corrosion resistant
- c) Lightweight and Versatile as shape and sizes can be amended to suit site conditions or usage requirements
- d) Ease of use as the connection can be arranged to be socket type or flange type to connect to not only FRP / GRP pipes, it can also be connected to other materials of pipe





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DESIGN CHARACTERISTICS

SUN SEA's pipes and ducts are fabricated based on the following principles

a) Fabrication Standard

All tanks fabricated and tested in accordance to NBS PS15-69 for hand lay pipeworks and ASTM D2996 for filament wound pipeworks

Other standards are available upon request subject to availability.

SUN SEA provides fiberglass wrapping for additional protection of pipeworks manufactured of other materials or as a form of repair works or refurbishment works for fiberglass ductworks or pipeworks.

Table of referred standards

Description	Reference Standard
Barcol Hardness	ASTM D2583
Tensile Strength, psi	ASTM D638
Tensile Modulus, psi x 10	ASTM D638
Tensile Elongation %	ASTM D638
Flexural Strength, psi	ASTM D790
Flexural Modulus, psi x 10	ASTM D790
Corrosion Resistance	ASTM C581
Heat Distortion Temperature (if relevant)	ASTM D648
Flanges	ANSI 150

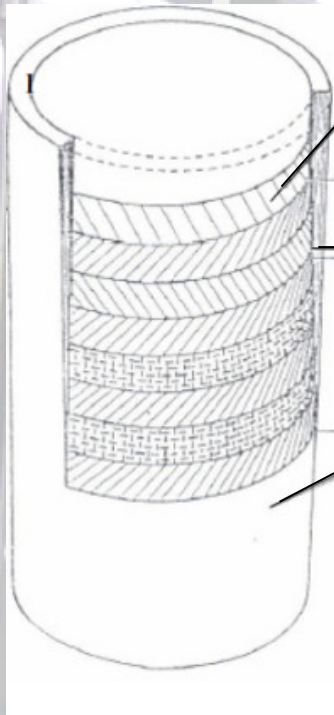


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b) *Fabrication General Structure*

Note : SUN SEA reserves the right to change the above lamination structure.



Inner Surface :

Resin rich interior surface reinforced with surfacing veil. This layer provides optimum corrosion resistance when used with proper selection of resin for specified chemical conditions

Structural Layer :

Subsequent reinforcing layers are applied to build pipe to desired strength or thickness.

Exterior Surface :

Final layer is resin rich surfacing veil. This exterior layer provides protection against weathering , fumes, spillage and ultraviolet attack.

c) *Types of Ductworks / Pipeworks*

SUN SEA fabricates a variety of pipeworks and ductworks for various purpose. Following table indicates the various types. Duct and Pipeworks can also be insulated or double-cased to allow usage in extreme temperatures.

Round Duct	Rectangular Duct	Flanges	Damper	Air Release Vent
				



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DUCT & FITTING SIZES

The following table list some standard thickness of pipes and fittings used above ground. Thickness will be adjusted accordingly to different usage and pressure conditions. Underground pipes will differ accordingly.

Note :

Size (mm)	Thickness (mm)	
	Duct / Pipe	Fittings
50	4.5	6.0
80	4.5	6.0
100	4.5	6.0
150	4.5	6.0
200	5.0	6.0
250	5.0	8.0
300	6.0	8.0
350	6.0	10.0
400	6.5	12.0
450	6.5	12.0
500	7.0	12.0
600	7.5	15.0
700	8.5	18.0
800	9.0	20.0
900	10.0	22.0
1000	11.0	24.0

- 1) SUN SEA reserves the right to adjust the thickness in accordance to the thickness of the duct/pipes and fittings subject to condition.
- 2) SUN SEA pipe length standard is 3000mm per length.
- 3) SUN SEA pipe comes with straight ends and does not include socket or flanges. If required, please advice during inquiry.



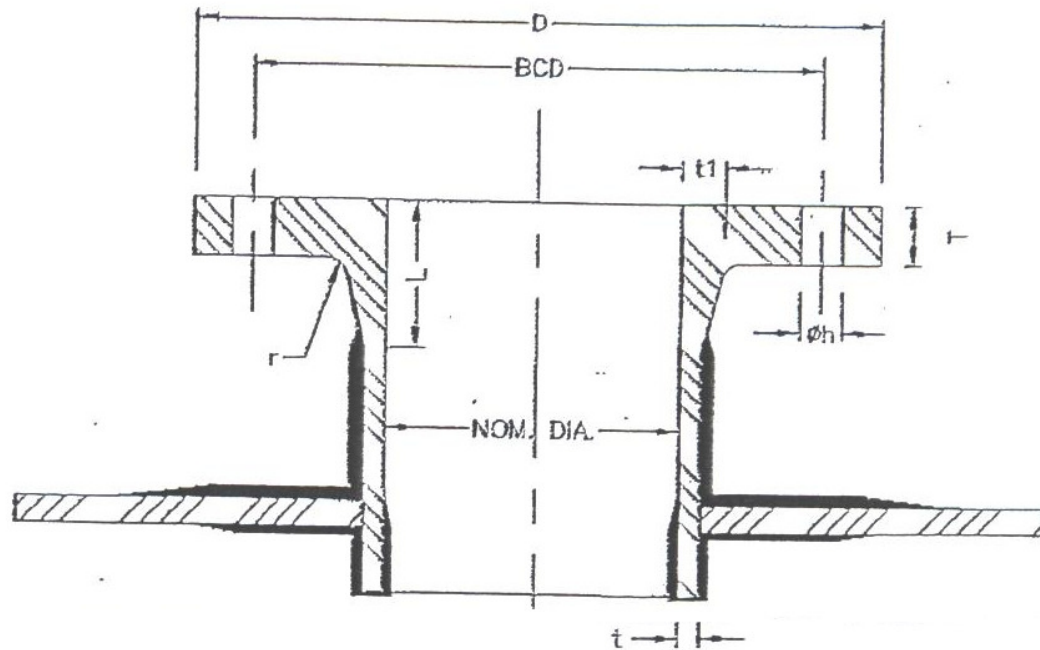
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FLAT FACE FLANGES (ANSI 150 LBS)



SUN SEA standard air pipes come with 60mm width flanges all around.

The following table list some standard flange sizes and thickness based on ANSI 150 LBS. Thickness will be adjusted accordingly to different usage and pressure conditions.

Nom Dia (mm)	D (mm)	B.C.D. (mm)	Thickness (mm)
50	152.4	120.6	17.4
80	190.5	152.4	22.2
100	228.6	190.5	22.2
150	279.4	241.3	23.8
200	342.9	298.4	27.0
250	406.4	361.9	28.6
300	482.6	431.8	30.1

NOTE :

- 1) Above measurements are only for reference. Subject to situation, SUN SEA reserves the right to change the dimensions accordingly
- 2) Standard air flanges comes with 60mm width flanges and are normally of thickness 5-12mm. The above table are for ANSI standard 150LBS if required.