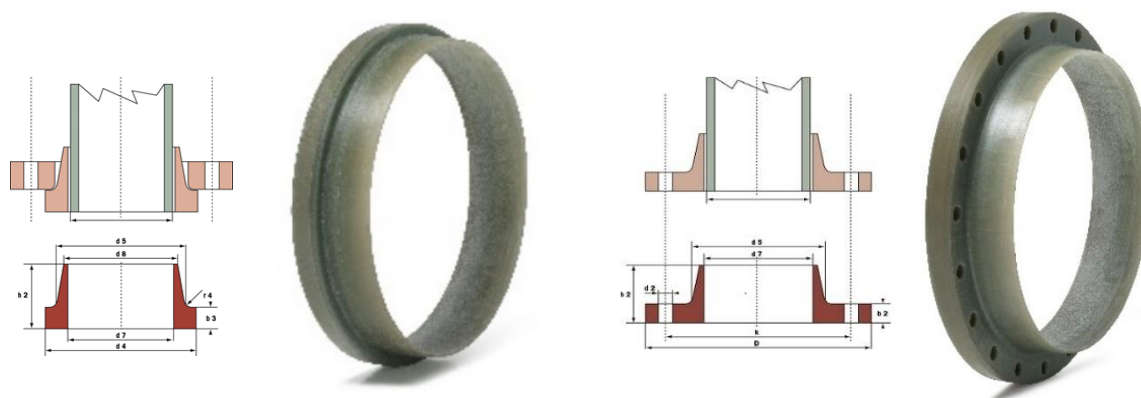


Composite Flanges by Resin Transfer Molding

Glassfiber Reinforced Composite Flanges made by Resin Transfer Molding (RTM) are corrosion free, high performance products, suitable for Thermoset (GRP and GRE) pipe systems.

The RTM manufacturing technology is an injection based, closed mold, manufacturing method, ensuring high fiber content and high performance laminates, having long, oriented fiber directions, capable to handle high mechanical loads. The flanges are being manufactured in Steel and/or Aluminum molds without any pipe being involved. The flange surfaces are smooth and precise without any machining, only the inside flange surface is being machined to get a raw surface for bonding the flange onto the pipe by (Epoxy) adhesive. Bonding of the flange onto the pipe is being made in a separate step, allowing flange selection at any time without pre-defining the total pipe spool and availability of pipe prior to manufacturing the flange.

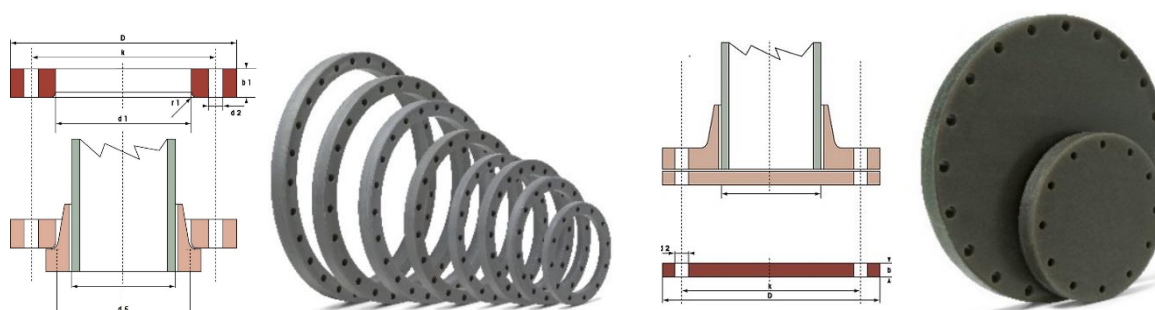
Schematic drawing and picture of Adhesive bonded Stub Flanges and Fixed Flanges Type A:



The full diameter range is available with Cylindrical inside (Type A) and, up to DN 1.200, flanges are available with Conical (Tapered) inside (Type B). The inside angle (taper) of Type B flanges can be 1 to 2,5 degrees to meet the pipe dimensions and bonding length.

Next to adhesive bonded flanges (Stub Flanges and Fixed Flanges), composite Blind Flanges and Backing Rings are being manufactured by RTM, both suitable for Thermoset and Thermoplastic pipe systems. Those flanges are a very good and competitive alternative for Stainless Steel alloys (SS 304 / SS 316 / Duplex), are corrosion resistant and light weight. Blind Flanges can be manufactured with Thermoplastic inner liner like PE, PP, PA or PVC for specific chemical applications and/or to match with the material of the thermoplastic pipe system.

Schematic drawing and picture of Backing Rings and Blind Flanges



Standard laminate reinforcements of RTM flanges are Glass fiber fabrics +/- 45 degr. and/or 0-90 degr. in all structural laminates and a polymer concrete core for high stiffness. The glass content is 60-65 % by weight in the structural outer laminate layers. The "human factor" during manufacturing is reduced to a minimum, resulting in a high and very constant quality. By the RTM technology flanges are very well reproducible at reduced cycle time, resulting in constant quality, high performance products at reduced delivery times.

Composite Flanges by Resin Transfer Molding

Specifications RTM Flanges :

- Resin : Bisphenol A based Vinylester or Epoxy
- Glass reinforcement : Multi axial U.D. E-glass
- Color : Black, Grey or Natural (braun/green)
- Max. operational temp.: up to 120 degr.C. depending on resin
- UV resistance : Only in Black or Grey color
- Pressure ratings (Max. Working Pressure) : 1 – 32 bar
- Max. Non Destructive Test Pressure : 1.5 times pressure rating

All flanges are available with drillings according to different Standards :

- EN 1092 : PN 6 / PN 10 / PN 16 / PN 25 / PN 40
- ASA / ANSI : 150 / 300
- AWWA : AW 5 / AW 6
- JIS : 5 K / 10 K / 16 K / 20 K / 30 K / 40 K
- AS 4087 : PN 16 / PN 35

The diameter range for Adhesive bonded (Stub and Fixed) Flanges and Blind Flanges is from DN 150 up to DN 2500 and could be extended to DN 4000. For RTM Backing Rings the diameter range is from DN 200 up to DN 1.400, this range could be extended to DN 3000.

Below table is showing the DN and available pressure ratings for each flange type.

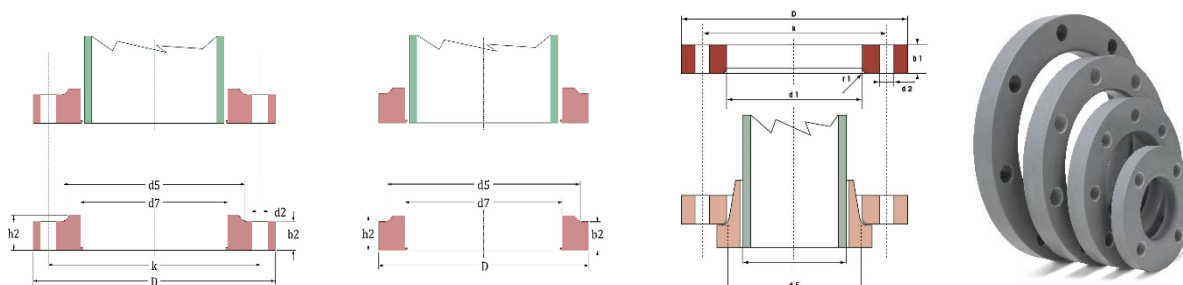
Pressure rating	Fixed Flanges Type A	Stub Flanges Type A	Backing Rings	Blind Flanges
PN 3	DN 500 – DN 2500	DN 500 – DN 2500	DN 500 – DN 1400	DN 400 – DN 2500
PN 6	DN 900 – DN 2500	DN 900 – DN 2500	DN 900 – DN 1400	DN 500 – DN 2500
PN 10	DN 150 – DN 2500	DN 150 – DN 2500	DN 200 – DN 1400	DN 100 – DN 2500
PN 16	DN 150 – DN 1800	DN 150 – DN 1800	DN 200 – DN 1000	DN 25 – DN 1800
PN 20	DN 150 – DN 1200	DN 150 – DN 1200	DN 200 – DN 800	DN 25 – DN 1200
PN 25	DN 150 – DN 1200	DN 150 – DN 1200	DN 200 – DN 600	DN 25 – DN 1200
PN 32	DN 150 – DN 600	DN 150 – DN 600	DN 200 – DN 600	DN 25 – DN 600

Composite Flanges by Hot Pressing SMC

Glassfiber Reinforced Composite Flanges made by Hot Pressing are corrosion free, high performance products, suitable for small diameter GRP pipe systems.

The Hot Pressing manufacturing technology is a closed mold manufacturing method, ensuring low cost, high performance laminates with very constant quality. The flanges are being manufactured in Steel molds at high temperature (approx. 150 degr.C.). The flange surfaces are smooth and precise without any machining, only the inside flange surface is being machined to get a raw surface for bonding the flange onto the pipe by (Epoxy) adhesive. The raw material for hot pressing is Sheet Molding Compound (SMC), a pre-fabricated compound in a sheet, containing chopped glass fiber, resin and additives.

Schematic drawing and picture of SMC Fixed Flanges, Stub Flanges and Backing Rings



Composite Flanges by Hot Pressing SMC

Standard laminate reinforcement of SMC flanges is chopped glass fiber with a fiber length of 50 mm, the glass content is 50-54 % by weight. Also by this manufacturing method, the “human factor” during manufacturing is reduced to a minimum. By the Hot Pressing technology flanges are very well reproducible at short cycle time, resulting in constant quality, high performance products at reduced delivery times. Hot Pressing is very suitable for high volumes of small diameter flanges.

Bonding of the flange onto the pipe is being made in a separate step, allowing flange selection at any time without pre-defining the total pipe spool and availability of pipe prior to manufacturing the flange.

The full diameter range is available with Cylindrical or Conical (Tapered) inside. The inside shape can be machined to customer’s specifications to meet the pipe dimensions.

Next to adhesive bonded flanges (Stub Flanges and Fixed Flanges), Backing Rings are being manufactured in SMC. Having different inner diameters, the Backing Rings are suitable for both Thermoset and Thermoplastic (PE, PP, PA or PVC) pipe systems, matching with the different dimensions of the Stub Flanges.

Specifications SMC Flanges :

- Resin : Bisphenol A based Vinylester
- Glass reinforcement : Chopped E-glass
- Color : off white
- Max. operational temp.: up to 90 degr.C.
- UV resistance : built in UV blocker
- Pressure ratings (Max. Working Pressure) : 1 – 16 bar (diameter related)
- Max. Non Destructive Test Pressure : 1.5 times pressure rating

All flanges are available with drillings according to different Standards :

- EN 1092 : PN 6 / PN 10 / PN 16
- ASA / ANSI : 150
- AWWA : AW 5
- JIS : 5 K / 10 K / 16 K
- AS 4087 : PN 16

Below table is showing the DN and available pressure ratings for each flange type.

Pressure rating	Fixed (Block) Flanges	Stub Flanges	Backing Rings
PN 6	DN 200 – DN 300	DN 200 – DN 300	DN 200 – DN 300
PN 10	DN 25 – DN 300	DN 25 – DN 300	DN 25 – DN 300
PN 16	DN 25 – DN 150	DN 25 – DN 200	DN 25 – DN 200

A full range of composite flanges by state of the art technology to cover your needs!

