GLASS FIBRE TAPE REINFORCED THERMOPLASTIC PIPE

Product information

tdes.co.nz



Glass fibre tape reinforced thermoplastic composite pipe (GFT-RTP) is **next generation technology for industrial pipeline installations and infrastructure.**

It's a composite pipe with a high strength glass fibre reinforced core between an inner and outer layer of thermoplastic. It is available in small and large diameters. The result is a pipe product that is stronger, thinner, lighter and cheaper to manufacture than thermoplastic pipe or other FRP or GRP products. Currently in use in the oil industry, it has proved to be an unbeatable alternative to other forms of pipe.

This superior performance, combined with our ability to manufacture GFT-RTP in continuous lengths, makes it suitable for any industrial application.

GFT-RTP is a patented product, manufactured in China and able to be shipped anywhere in the world.

We can supply you directly from China, as manufactured by Baoji Tianlian Huitong Composite Materials Co Ltd, for whom we hold agency

Or, if you have a large demand for the product, contact us to discuss setting up a factory and having the rights to manufacture GFT-RTP in your country.

1.0

Manufacturing Company **Profile**

Baoji Tianlian Huitong Composite Materials Co., Ltd. was established in July 2015 with a registered capital of RMB 102 million. We currently hold 48 technical patents and have obtained multiple international certifications, including API Q1 and API 15S. The company is a national-level high-tech enterprise and possesses a Shaanxi Provincial Enterprise Technology Center and a CNAS-certified laboratory. The company has introduced the world's leading GFT-RTP production technology and manufactures multiple series of RTP products. Our products are widely used in fields such as oil and gas production and transportation, mining and slurry transportation, municipal water conservancy, gas energy storage (hydrogen and carbon dioxide), and chemical production. By the end of 2025, our company had completed the manufacturing, domestic and international delivery, and installation and operation of 16,000 kilometers of RTP products in various specifications, making us a leading enterprise in RTP research and development, manufacturing, installation, and operation internationally.



营业执照

(副本)

The company has obtained: API Q1 Quality Management System Certification, API



Certificate of Authority to use the Official API Monogram

License Number: 15S-0018

BAOJI TIANLIAN HUITONG COMPOSITE MATERIAL CO., LTD.
No. 368, South section of Gaoxin Avenue, Panxi Town, Chencang District
Baoji, Shaanxi
People's Republic of China

American Petroleum Institute

GMS Exclusions: Validation of Processes

Effective Date: FEBRUARY 29, 2025
Expiration Date: MARCH 29, 2027

API 15S Product Certificate



REGISTRATION NO. Q1-4397

Certificate of Registration

BAOJI TIANLIAN HUITONG COMPOSITE MATERIAL CO., LTD.
No. 368, South section of Gaoxin Avenue, Panxi Town, Chencang District
Baoji, Shaanxi
People's Republic of China

API Spec Q1, 10th Edition

Design, Manufacture, Sales and Service of Steel Reinforced Pipe and Non-metallic Reinforced Pipe of Glass Fiber, Aramid Fiber and Polyester Fiber for the Oil and Gas Industry

Validation of Processes

Effective Date: FEBRUARY 20, 2025
Expiration Date: MARCH 29, 2027
Registered Since: MARCH 29, 2021

API Spec Q1 Registered

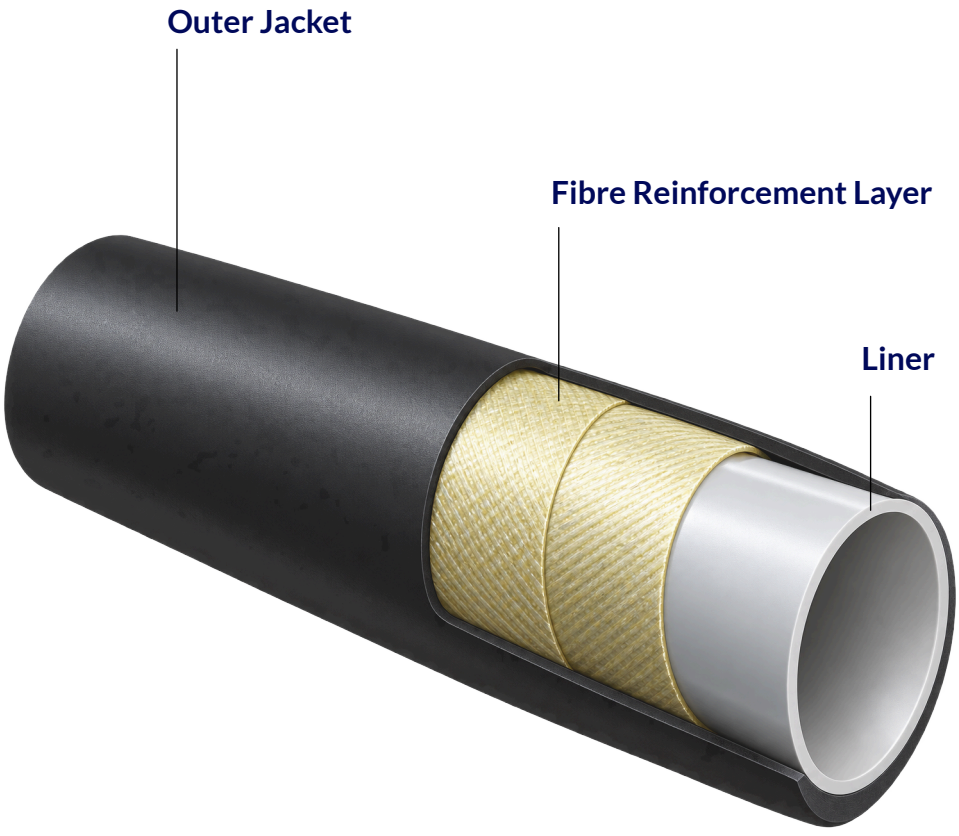
API Q1 Quality Management System Certificate

15S Product Certification; ISO 9001 Certification, ISO 14001 vCertification, ISO 45001 Certification, Intellectual Property Management System Certification, and HSE Certification. It holds 48 patents, including 12 invention patents.

2.0

Product
Introduction

Reinforced Thermoplastic Pipe (RTP) is generally composed of three layers: an inner liner layer, a reinforcement layer, and an outer protective layer. The inner liner layer serves as the medium transmission layer and is formed by hot-melt extrusion of various polymer materials. The reinforcement layer is made by circumferentially winding various fibres or fibre prepreg tapes around the outer surface of the inner liner layer and mainly bears the pressure-bearing capacity of the composite pipe. The outer protective layer is formed by hot-melt extrusion coating of polymer materials onto the outer surface of the reinforcement layer, mainly protecting the composite pipe from external impacts and various types of damage



2.1

Glass fibre
Composite Tape

The company has developed a glass fibre composite tape (GFT) specifically for RTP reinforcement. GFT is a high-strength, high-toughness tape that overcomes the shortcomings of other glass fibre prepreg tapes on the market, such as high brittleness, susceptibility to bending and fracture, and difficulty in fusion bonding. It avoids the problems of cracking and delamination between the reinforcement layer and the inner/outer layers, as well as between reinforcement layers, in traditional glass fibre reinforced RTP. It also solves a series of issues associated with traditional glass fibre reinforced RTP, such as large coil diameters and relatively high requirements for construction and installation, giving it broad market application prospects in many fields. GFT's performance is similar to that of aramid tape, but its cost is far lower than aramid, making it more economical. GFT has complete intellectual property rights and is exclusively produced by us.

The reinforcement layer of GFT-RTP is glass fibre composite tape (GFT), which is a patented technology product.



2.1 Glass fibre **Composite Tape**



GFT-RTP dimensions

Type		GFT-05	Type	Thickness (mm)	Width (mm)
GFT-75-05	0.5 (+0.07/−0.07)	75 (+3/−7)	GFT-200-07	0.7 (+0.07/−0.07)	200 (+3/−7)
GFT-100-05	0.5 (+0.07/−0.07)	100 (+3/−7)	GFT-250-07	0.7 (+0.07/−0.07)	250 (+3/−7)
GFT-150-05	0.5 (+0.07/−0.07)	150 (+3/−7)	GFT-300-07	0.7 (+0.07/−0.07)	300 (+3/−7)
GFT-200-05	0.5 (+0.07/−0.07)	200 (+3/−7)	GFT-150-09	0.9 (+0.07/−0.07)	150 (+3/−7)
GFT-250-05	0.5 (+0.07/−0.07)	250 (+3/−7)	GFT-200-09	0.9 (+0.07/−0.07)	200 (+3/−7)
GFT-300-05	0.5 (+0.07/−0.07)	300 (+3/−7)	GFT-250-09	0.9 (+0.07/−0.07)	250 (+3/−7)
GFT-150-07	0.7 (+0.07/−0.07)	150 (+3/−7)	GFT-300-07	0.9 (+0.07/−0.07)	300 (+3/−7)

GFT short-term mechanical properties

Type	GFT-05	GFT-07	GFT-09
Longitudinal tensile strength/MPa	≥237	≥339	≥396
Linear density of glass fibre	1200tex	2400tex	3600tex
tensile strength of glass fibre/MPa	≥0.45 N/TEX	≥0.45 N/TEX	≥0.45 N/TEX

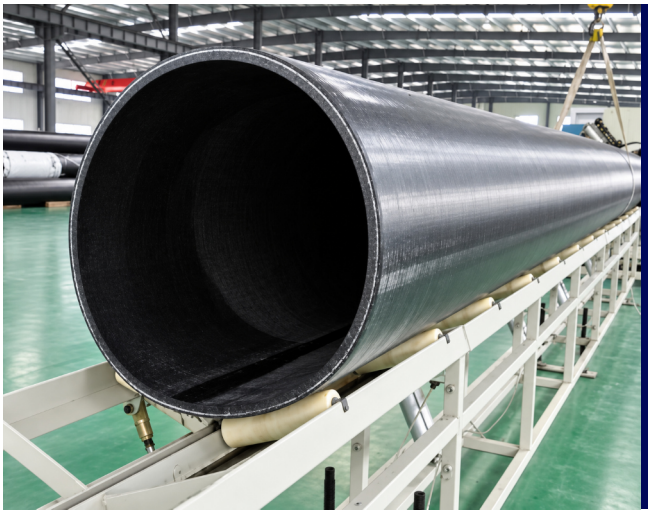
GFT long-term mechanical properties

Type	Tensile strength (MPa)	Time (h)	Requirement
GFT-05	118.5	1000	No-break
GFT-07	169.5	1000	No-break
GFT-09	198	1000	No-break

2.2

GFT-RTP

We have independently developed a complete set of production technology for continuous glass fibre tape reinforced thermoplastic composite pipe (GFT-RTP) and successfully developed the core equipment for this pipe — the GFT-dedicated winding machine, which has now achieved industrialized and stable mass production. Leveraging this breakthrough in core equipment, we have built a complete largediameter GFT-RTP production line, and for the first time internationally, overcome the challenge of continuous production of large-diameter GFT-RTP, forming a high-end complete set of manufacturing equipment with independent intellectual property rights. At the same time, addressing pain points in engineering applications, we have developed economical and reliable pipe connection technology that fully meets on-site construction needs. Furthermore, we have completed the research, development, and industrialization of recycling technology for GFT-RTP production waste and failed pipes, establishing a complete technical system covering pipe manufacturing, on-site installation and resource recovery of waste pipes. The entire GFT-RTP technology portfolio includes 22 patents, of which 12 are invention patents.



According to the temperature of the transported medium, GFT-RTP is classified into three types: high-temperature type GFT-RTP III (medium temperature 85-110°C), medium-temperature type GFT-RTP II (medium or ambient temperature 60-85°C), and normal-temperature type GFT-RTP I (medium or ambient temperature below 60°C).

2.2

GFT-RTP I

GFT-RTP I features relatively high-pressure resistance and corrosion resistance. It can transport raw water, wastewater, etc. at normal temperatures. With a co-extruded POE wear-resistant layer as the inner liner, it can transport abrasive solid-liquid two-phase flows such as mineral slurry and sand-laden water at normal temperatures.

GFT-RTP I is mainly produced in large diameters (8-60 inches), and coilable products can also be manufactured according to customer requirements. The thickness of the POE wear-resistant layer can be designed according to customer requirements, generally 3-6 mm.



The Pipe Wall Structure:
POE/HDPE/GFT/HDPE

GFT-RTP I minimum wall thickness (mm) by nominal pressure (MPa)

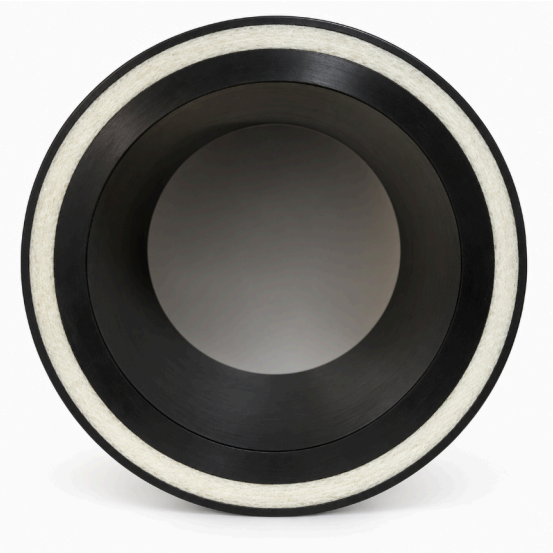
Outer diameter (mm)	0.8	1.0	1.25	1.6	2.0	2.5	3.0	3.5	4.0	4.5	5.0
200	10.6	10.6	11.0	12.0	12.0	12.4	12.8	13.8	14.2	14.6	15.6
225	11.3	11.7	12.7	12.7	13.1	14.7	14.9	15.3	16.7	17.1	18.1
250	12.1	12.5	13.5	13.5	13.9	15.3	15.7	16.1	17.1	17.9	18.9
280	13.4	13.4	14.4	14.8	15.2	16.2	16.6	18.0	18.4	18.8	19.8
315	15.0	16.0	16.0	1.64	1.78	18.2	19.6	20.0	21.4	21.8	23.2
355	17.2	17.2	17.6	18.0	19.4	20.8	21.6	23.0	23.4	24.8	26.2
400	18.6	18.6	19.0	20.4	20.8	22.2	23.0	24.4	25.8	26.6	27.6
450	20.1	20.5	20.9	22.3	23.7	24.5	25.9	27.	29.1	29.9	31.7
500	21.6	22.0	22.4	23.8	25.2	2.0	27.8	29.2	30.6	32.4	-
560	24.4	24.8	26.2	2.6	28.4	30.2	31.6	33.4	35.2	-	-
630	26.5	26.5	28.3	29.7	30.5	32.3	34.1	-	-	-	-
710	29.4	30.8	32.2	33.0	34.8	37.6	-	-	-	-	-
800	34.1	34.5	35.9	37.7	39.5	-	-	-	-	-	-
900	37.6	39.0	39.8	41.6	44.4	-	-	-	-	-	-
1000	40.6	42.0	42.8	45.6	-	-	-	-	-	-	-
1200	47.4	48.2	50.0	52.8	-	-	-	-	-	-	-
1400	53.8	55.6	57.4	-	-	-	-	-	-	-	-
1600	61.2	63.4	65.2	-	-	-	-	-	-	-	-

2.2

GFT-RTP II

GFT-RTP II is resistant to medium temperatures and high pressures and features excellent corrosion resistance. It can transport various multiphase and single-phase flows, such as oil well produced fluids and wastewater separated at combined stations under medium temperatures, making it suitable for use as oil well gathering and transportation pipelines and downstream wastewater pipelines under medium temperatures.

GFT-RTP II is available in two size categories:
Coilable (2–8 inches) and Non-coilable (8–40 inches).



The Pipeline Structure:
PERT/GFT/PERT

GFT-RTP II minimum wall thickness (mm) by nominal pressure (MPa)

Outer diameter (mm)	0.8	1.0	1.25	1.6	2.0	2.5	3.0	3.5	4.0	4.5	5.0
200	10.6	10.6	11.0	12.0	12.0	12.4	12.8	13.8	14.2	14.6	15.6
225	11.3	11.7	12.7	12.7	13.1	14.7	14.9	15.3	16.7	17.1	18.1
250	12.1	12.5	13.5	13.5	13.9	15.3	15.7	16.1	17.1	17.9	18.9
280	13.4	13.4	14.4	14.8	15.2	16.2	16.6	18.0	18.4	18.8	19.8
315	15.0	16.0	16.0	1.64	1.78	18.2	19.6	20.0	21.4	21.8	23.2
355	17.2	17.2	17.6	18.0	19.4	20.8	21.6	23.0	23.4	24.8	26.2
400	18.6	18.6	19.0	20.4	20.8	22.2	23.0	24.4	25.8	26.6	27.6
450	20.1	20.5	20.9	22.3	23.7	24.5	25.9	27.	29.1	29.9	31.7
500	21.6	22.0	22.4	23.8	25.2	2.0	27.8	29.2	30.6	32.4	-
560	24.4	24.8	26.2	2.6	28.4	30.2	31.6	33.4	35.2	-	-
630	26.5	26.5	28.3	29.7	30.5	32.3	34.1	-	-	-	-
710	29.4	30.8	32.2	33.0	34.8	37.6	-	-	-	-	-
800	34.1	34.5	35.9	37.7	39.5	-	-	-	-	-	-
900	37.6	39.0	39.8	41.6	44.4	-	-	-	-	-	-
1000	40.6	42.0	42.8	45.6	-	-	-	-	-	-	-

2.2

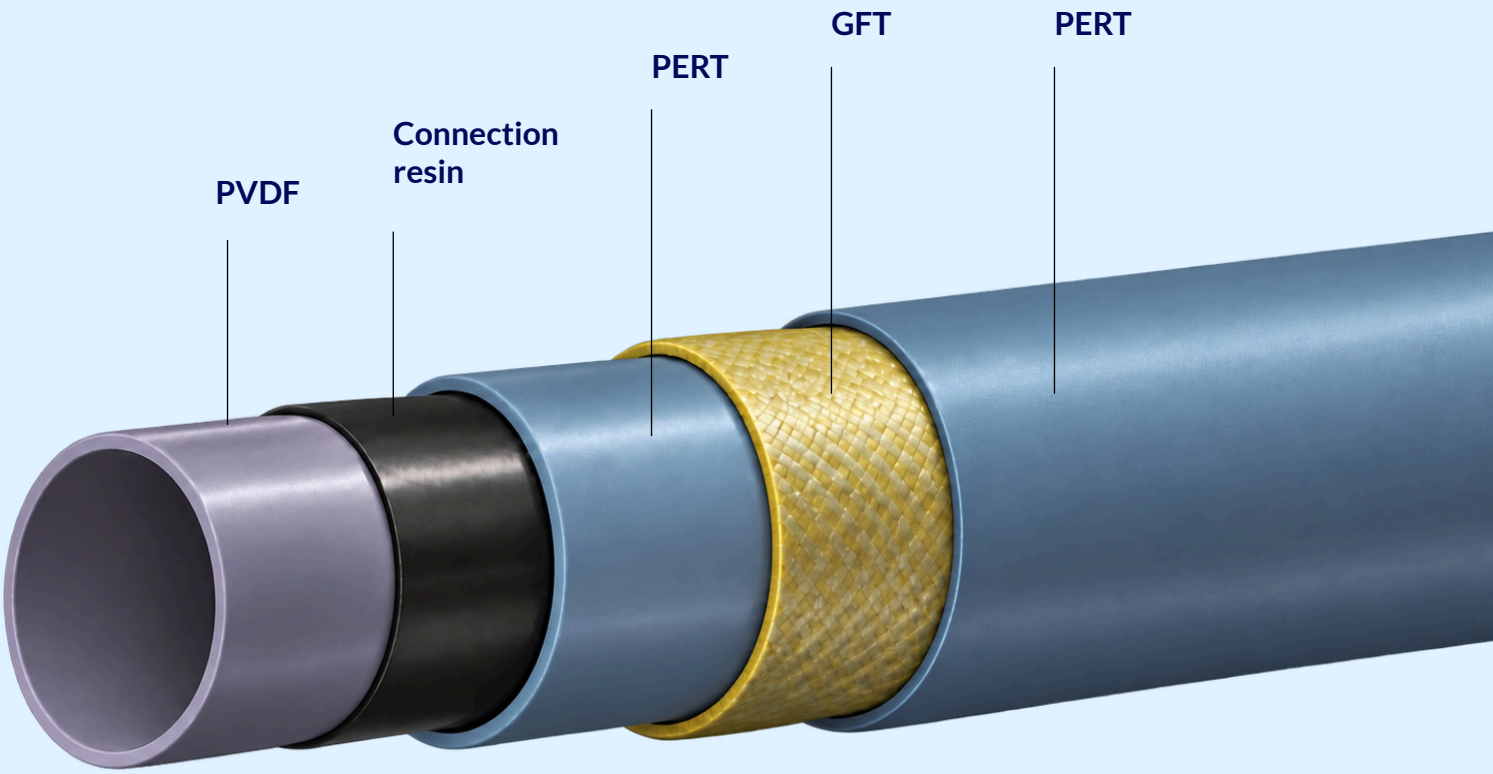
GFT-RTP III

GFT-RTP III is resistant to high temperatures and high pressures and features high barrier properties and corrosion resistance. It can transport oil-water mixtures, natural gas, crude oil, etc. under high temperature and high pressure, making it suitable for use as gathering and transportation pipelines in oil and gas fields.

GFT-RTP III is generally available in sizes ranging from 2 to 8 inches and can be coiled. Customized large-size products can also be manufactured according to customer requirements.



Physical product illustration of
PVDF/bonding Resin/PERT/GFT/PERT
(the inner liner layer is co-extruded in three layers,
with the black portion being the bonding resin)



The pipe wall structure of GFT-RTP III:
PVDF/connection resin/PERT/GFT/PERT

Coilable GFT-RTP III **Parameters**

Nominal diameter (mm)	Nominal pressure (MPa)	Minimum wall thickness (mm)	Minimum working bending radius (mm)	Single length (m)	Reel size (mm)
50	6.4	11.0	1750	600	2500*2000
50	12	12.5	1750	600	2500*2000
50	16	13.5	1750	600	2500*2000
50	20	13.5	1750	600	2500*2000
50	25	15.0	1750	600	2500*2000
50	32	18.5	1750	600	2500*2000
60	6.4	12.5	1900	500	2500*2000
60	12	14.5	1900	500	2500*2000
60	16	14.5	1900	500	2500*2000
60	20	16.0	1900	500	2500*2000
60	25	17.5	1900	500	2500*2000
60	32	18.5	1900	500	2500*2000
70	6.4	12.0	2300	650	3200*2800
70	12	14.5	2300	650	3200*2800
70	16	14.5	2300	650	3200*2800
70	20	15.5	2300	650	3200*2800
70	25	17.5	2300	650	3200*2800
70	32	17.5	2300	650	3200*2800
80	6.4	14.0	2600	600	3200*2800
80	12	16.5	2600	600	3200*2800
80	16	16.5	2600	600	3200*2800
80	20	18.0	2600	600	3200*2800
80	25	18.0	2600	600	3200*2800
90	6.4	14.5	2900	700	3750*2800
90	12	16.5	2900	700	3750*2800
90	16	16.5	2900	700	3750*2800
90	20	18.0	2900	700	3750*2800
90	25	18.0	2900	700	3750*2800
100	6.4	15.5	3200	600	3750*2800

Coilable GFT-RTP III
Parameters (continued)

Nominal diameter (mm)	Nominal pressure (MPa)	Minimum wall thickness (mm)	Minimum working bending radius (mm)	Single length (m)	Reel size (mm)
100	12	18.0	3200	600	3750*2800
100	16	18.0	3200	600	3750*2800
100	20	22.0	3200	600	3750*2800
125	4	18.0	3700	400	3750*2800
125	6.4	19.5	3700	400	3750*2800
125	8	19.5	3700	400	3750*2800
125	12	21.5	3700	400	3750*2800
125	16	21.5	3700	400	3750*2800
125	20	24.0	3700	400	3750*2800
150	4	20.5	4200	400	3750*2800
150	6.4	20.5	4200	300	3750*2800
150	8	21.5	4200	300	3750*2800
150	12	22.5	4200	300	3750*2800
150	16	24.5	4200	300	3750*2800
175	4	21.5	4500	250	3750*2800
175	6.4	21.5	4500	250	3750*2800
175	8	23.0	4500	250	3750*2800
175	12	23.0	4500	250	3750*2800
175	16	25.5	4500	250	3750*2800
200	2.5	20.0	5000	170	3900*2800
200	4	22.5	5000	170	3900*2800
200	6.4	22.5	5000	170	3900*2800
200	8	24.0	5000	170	3900*2800
200	12	25.5	5000	170	3900*2800
200	16	27.0	5000	170	3900*2800

2.3

Connection

GFT-RTP connections are classified into three types:

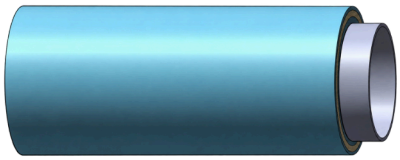
2.3.1

Permanent connection between GFT-RTP pipes:

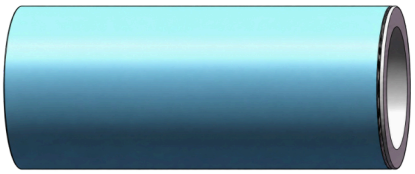
Non-metallic connection



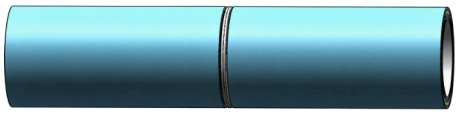
Step 1: Milling the end



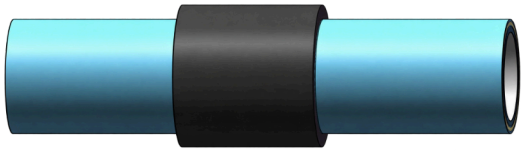
Step 2: Turning up



Step 3: Welding the ends together



Step 4: Reinforcing the joint



2.3

Connection (continued)

2.3.2

Detachable connection between GFT-RTP pipes:
Clamp Connection.

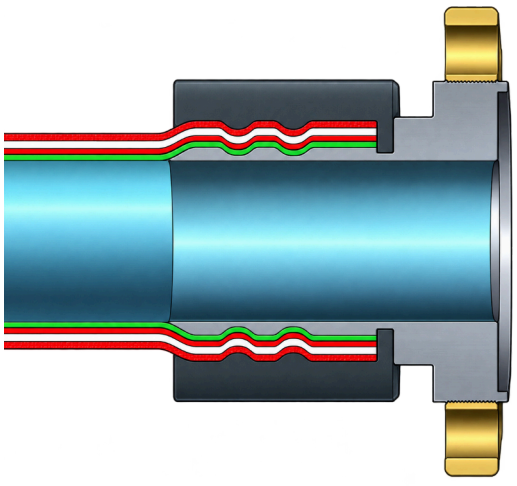




2.3.3

Connection between GFT-RTP and pumps, valves, etc:
Metal Flange Connection.







3.0

Quality **Control**

TLHT has perfect quality management system and complete testing equipment, and has passed API Q1 quality management system, ISO9001 system, mining safety standards and other system certification, as well as CNAS certification.

The company has a constant temperature and humidity indoor laboratory and independent pressure and burst test area, with more than 30 sets of testing and inspection instruments, which can meet the full range of RTP inspection requirements from raw materials to manufacturing processes to finished products, and achieve quality control throughout the production process of products, so as to provide users with highquality and reliable products.

Quality policy and objectives

Quality policy	Quality objectives
Customer first, quality first	Complaint handling rate: 100%
High quality and efficiency	One-time acceptance pass rate of products: >96%
Continuous improvement	Customer satisfaction: >95%
	Ex-factory pass rate of products: 100%

4.0

Service **System**

Service Philosophy

Prioritizing customer needs and focusing on seven core elements of quality, delivery time, safety, durability, environmental protection, intelligence, and localized one-stop after-sales service. We constantly improve our capability to respond quality and service philosophy and continuously meet and exceed customer expectations.

Service Team

The company has set up local service teams in Chinese mainland, Middle East, and Kazakhstan. After-sales service engineers can arrive on site within 24 hours



After-sales service engineers provide on-site training for overseas users



After-sales service engineers provide on-site installation training

5.0

Application **Examples**

Tatneft, Russia

A high-pressure glass fibre pipe project for Tatneft, Russia, involving 50 km each of DN80 and DN100, 17 MPa, used for transporting produced water at 60°C, and constructed in swamps during winter at -30°C.



Lukoil, Russia

A high-pressure glass fibre pipe project for Lukoil, Russia, involving DN100, 21 MPa, and 1,100 m, used for transporting produced water at 55°C, and laid in swamps.

Changqing Oilfield

A high-pressure glass fibre pipe project for Changqing Oilfield, involving DN65, 25 MPa, and more than 25 km, used for transporting produced water at 60°C, with longterm stable supply.



Tuha Oilfield

The glass fibre pipe project for Tuha Oilfield covers multiple specifications of highpressure pipes, including DN100-12 MPa (12 km), DN40-16 MPa, and DN50-16 MPa (totaling over 200 km), used for crude oil/heavy oil transportation at 65°C (requiring hot washing at 90°C), and laid in the Gobi Desert.



Qinghai Oilfield

The glass fibre pipe project for Qinghai Oilfield covers multiple specifications of high-pressure pipes, including DN50-4 MPa (16 km), DN40-25 MPa (8 km), and DN40-32 MPa (13 km), used for oil and gas gathering and transportation as well as water injection at 70°C, and laid in the Gobi Desert.

Jianghan Oilfield

The glass fibre pipe project for Jianghan Oilfield covers multiple specifications of high-pressure pipes, including DN100-12 MPa (12 km), DN50/DN65/DN80-16 MPa, and DN50/DN65-25 MPa, used for oil and gas gathering and transportation, injection, and produced water/ wastewater transportation below 65°C, and laid on plains.



Shengli Oilfield

The Gudong No.1 and No.2 Area renewal and renovation project of Shengli Oilfield involves DN200-6.4 MPa, 74.8 km glass fibre pipes, used for heavy oil transportation at 65°C, and laid on plains.





6.0

FAQs

How safe is the GFT-RTP Pipe?

GFT-RTP is similar to HDPE pipe, except flexible. In medium and low pressure applications, the connection method is also by butt welding, so its safety is similar to HDPE pipe. Due to the high strength of the reinforcement layer, GFT-RTP has better axial tensile capacity and better resistance to external force damage. It can still be used after being flattened. Therefore, GFT-RTP has better seismic resistance.

How economical is the GFT-RTP Pipe?

In addition to lower manufacturing cost, GFT-RTP is lighter in weight. The transportation and installation costs are lower than HDPE pipes and the inner diameter of GFT-RTP is larger than HDPE pipes, so the operating cost is also lower than HDPE pipes.

What is the long term performance potential of the GFT-RTP pipe?

GFT-RTP as a water pipeline has a service life greater than HDPE pipes (50 years). As a pipeline for oil and gas, the service life is generally greater than 20 years, and as a pipeline for conveying slurry, it is generally greater than 15 years. The service life of GFT-RTP has been rigorously and completely researched and confirmed. The service life of the inner layer and the outer layer of HDPE is at least the same as the HDPE pipe's, while the life of the reinforced layer, being under no effect from the medium, and under the premise of lower than the allowable stress, it will not fail.

Is the pipe outer diameter the same as current PE pipe outer diameters and do the same outside diameter tolerances apply?

Yes, the outer diameter and tolerance of GFT-RTP are consistent with current HDPE pipes, and the SDR of GFT-RTP is approximately 33.

Is the material suitable for joining with a seal ring system? Is there any long-term data to support this?

Yes, it can be sealed with a sealing ring. In a long-term hydrostatic test, the sealing ring is sealed between the pipe end and the blind plate.

What are the creep properties of the material?

The creep properties of GFT-RTP are completely different from HDPE. Glass fibre cannot creep, so in terms of material, GFT will not creep.

Is this pipe system suitable for tapping for offtakes (tapping bands or similar)? Can it be drilled on site?

No, GFT-RTP can neither tap nor punch holes.

Talk to TDES

GFT-RTP supply and manufacturing enquiries

Napier, New Zealand

(+64) 6 8351401 / (+64) 27 248 9707

info@tdes.co.nz

tdes.co.nz