



WATER WELL FIBER GLASS

Our Top Priority is Only Quality

Water Well FIBERGLASS Industries

Serving the Nation From 43 Years



- o Trusted
- o Tested
- o Certified



INTRODUCTION

Water Well Fiberglass is a known brand name of fiberglass pipes manufactured by Water Well Engineering.

The Company is pioneer in manufacturing tube-well material and industrial products and distributing tube-well materials all over in Pakistan.

Over the last 4 decades, the company has well established its operational network, manufacturing facilities, quality control standards and is recognized in Pakistan as a high tech engineering enterprise mainly involved in process, power and energy, heavy industries, water supply and sewerage, waste water treatment and desalination plants.

WWFG Pipes for tube wells are manufactured on automatic filament winding machine as per international standards. We stand as a reliable and dependable business partner for all clients.

A partner fulfilling client requirements and commitments at all time.



EPOXY PIPE SYSTEM

Epoxy pipes are manufactured by means of precision winding technique using glass roving's impregnated with epoxy resin wound on a rotating steel mandrel, which contributes to high strength and pressure rating of each pipe.

TUBE-WELL PIPES

WWFG is one of the leading companies in tube-well pipes.

It is a preferred piping solutions form many national and International organizations and departments.

PIPES FINISHING

WWFG Products shall be inspected for any resin/fiberglass lumps need to be grinded off the calibrated, cut ends and grinded surface shall be coated with the resin/curing mixture with smooth finishing.

OUR DISTINCTIONS

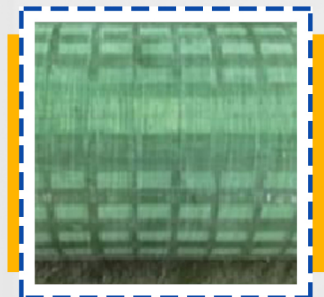
- WWFG Pioneers in Tube-well industry
- Largest Production Capacity
- Experience of 43 years
- ISO 9001 & PSQCA Certified
- Largest FRP Raw Material Importer in Pakistan
- Approved Suppliers of PHED, WASA
- Self Operating Unit
- In House Testing Facilities
- Manufacturing specs ASTM 2996-01
- Registered with EPA

RESEARCH & DEVELOPMENT

WWFG has modern and well equipped Research and Development Department, which includes well equipped advance laboratory and well trained technical experts to take care of day to day R&D tasks.

FIBER GLASS ADVANTAGES

In 1964, the World Bank commissioned the Consultants, Sir M. MacDonald and partners, to assess all unit applications of available tube-well pipes and screens to determine the most economical methods and constructions that would meet the requirements of strength, rigidity, chemical and impact, abrasion, saline waters, chemical cleaning fluids and explosives. In their report to World Bank, the Government of Pakistan, and WAPDA, the Consultants concluded that Fiberglass Reinforced Epoxy pipes and screen meet the requirements most economically and completely.





ADVANTAGES OF FIBERGLASS EPOXY TUBEWELL PIPES & STRAINERS

FRP/GRE piping system is time tested and its durability value in stormy environment and brutal applications is proven from decades.

Following factors give edge to FRP/GRE pipes over the other pipes.

• LONG LIFE

It has minimum service life of 40 years. The smooth inside surface is maintained throughout the entire life of the pipe.

• LIGHT WEIGHT

FRP/GRE pipes weight 50% to 60% lighter as compared to steel pipe and 40% lighter as compared to concrete pipes.

Due to being light weight these are easy to handle and cheaper to transport. The use of heavy equipment for handling is also practically eliminated.

• INSTALLATION BENEFITS

FRP/GRE pipes easier to install as they are in 6 meter length. This takes less time and has 75% fewer joints compared to other materials. Being light-weight is an added advantage for faster handling. These type of pipes are the least expensive in terms of handling, labour and machinery costs.

• VERY LOW FRICTION FACTOR

Value of 'C' in Hazen Williams equation for calculation head loss due to friction in pipes is 150 -160 for FRP/GRE pipes against 120-130 for steel pipes. Thus, the low friction coefficient and the hydraulic characteristics of FRP/GRE pipes lead to significant saving in pumping costs.

• CORROSION RESISTANCE

FRP/GRE piping system is resistant to corrosion both inside & outside these pipes have been used for handling dilute acids, saturated brine, organic solvents and other corrosive chemical.

As there is zero corrosion, any additional lining and exterior coating is not required.

• EXCELLENT FATIGUE RESISTANCE

Under cyclic loading FRP/GRE provides very high resistance to fatigue which enhances its performance for longer life.



• COST EFFECTIVE

20% to 30% more economical than steel pipe and 20% to 30% more economical than pre-stressed cement concrete pipes.

• DIMENSION STABILITY

FRP/GRE piping system can maintain the critical tolerances required for the most demanding structural and piping application. The material meets the most significant stiffness and dimensional tolerances.

• LOWER PUMPING COST

The low friction factor results in lower pumping cost, FRP/GRE material provides high flow rates and reduced pumping cost due to large bore and smooth internal surface. Thus saving huge energy costs during the life cycle of the pipe.

• LOW MAINTENANCE COST

No maintenance cost throughout the life because of absence of corrosion, zero replacement.

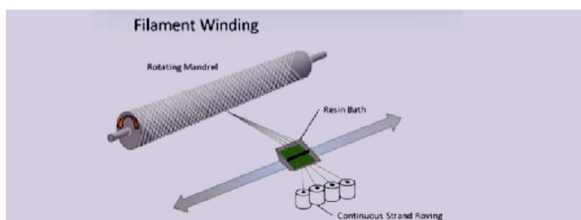
• SMOOTH INSIDE SURFACE

The smooth interior of FRP pipe results in low fluid resistance which lowers horse power requirement for pumping systems.

This characteristic contributes to substantial cost saving over the life of a typical piping system. The interior pipe surface remains smooth over time in most fluid services. Therefore fluid resistance does not increase with age.

• LOW THERMAL CONDUCTIVITY

Low thermal conductivity of FRP/GRE pipe not only causes low temperature losses but also in many cases eliminates condensation or the need for additional thermal insulation.





TUBE-WELLS

- Tube-wells consist of two types of pipes:
- Slotted pipes
- Blank pipes



SLOTTED PIPES

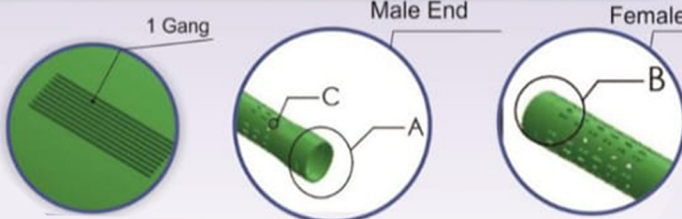
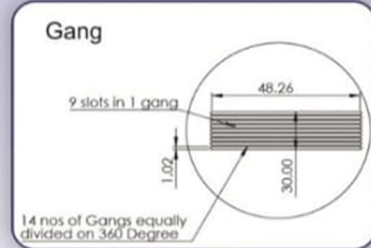
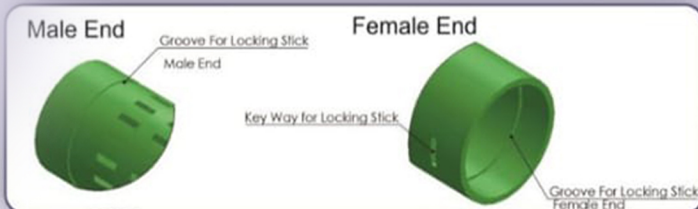
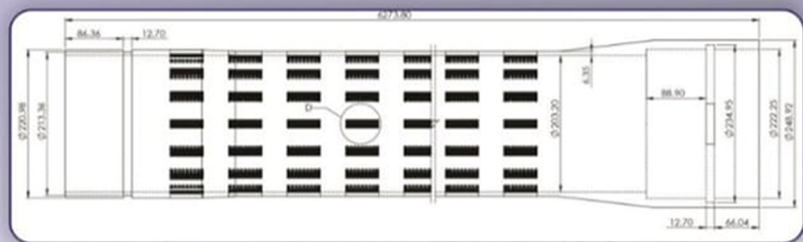
The Filter pipe is the most vital part of any tube-well as it is the section from where water is admitted into the well. Slotted pipes are perforated using a precision slotting machine which adds uniform slots and can be adjusted according to the requirement of the customer or on the start of the soil. The amount of water can be increased by increasing the open area of the slotted pipe's slots.

The major reasons why Fiberglass Strainers are preferred these days:

1. Large open area as compared to PVC and Brass Strainers.
2. 2.10% to 11% open area is achieved in WWFG Slotted Pipes, which is much more than PVC and Brass.

SLOTTED DETAILS

- 8" Strainer Pipe
- Slots in 1 Gang: 09 Nos
- Gang in 1 Round: 14 Nos
- Round in 1 Fit: 04 Nos
- Total Gangs in Filter: 1120 Nos
- Total Slots in Filter: 10080 Nos
- Open Area (Approx.): 10%





BLANK PIPE

The Blank Pipe is a plain solid which is used to draw water up the well. This pipe also houses the motor which pumps out the water.

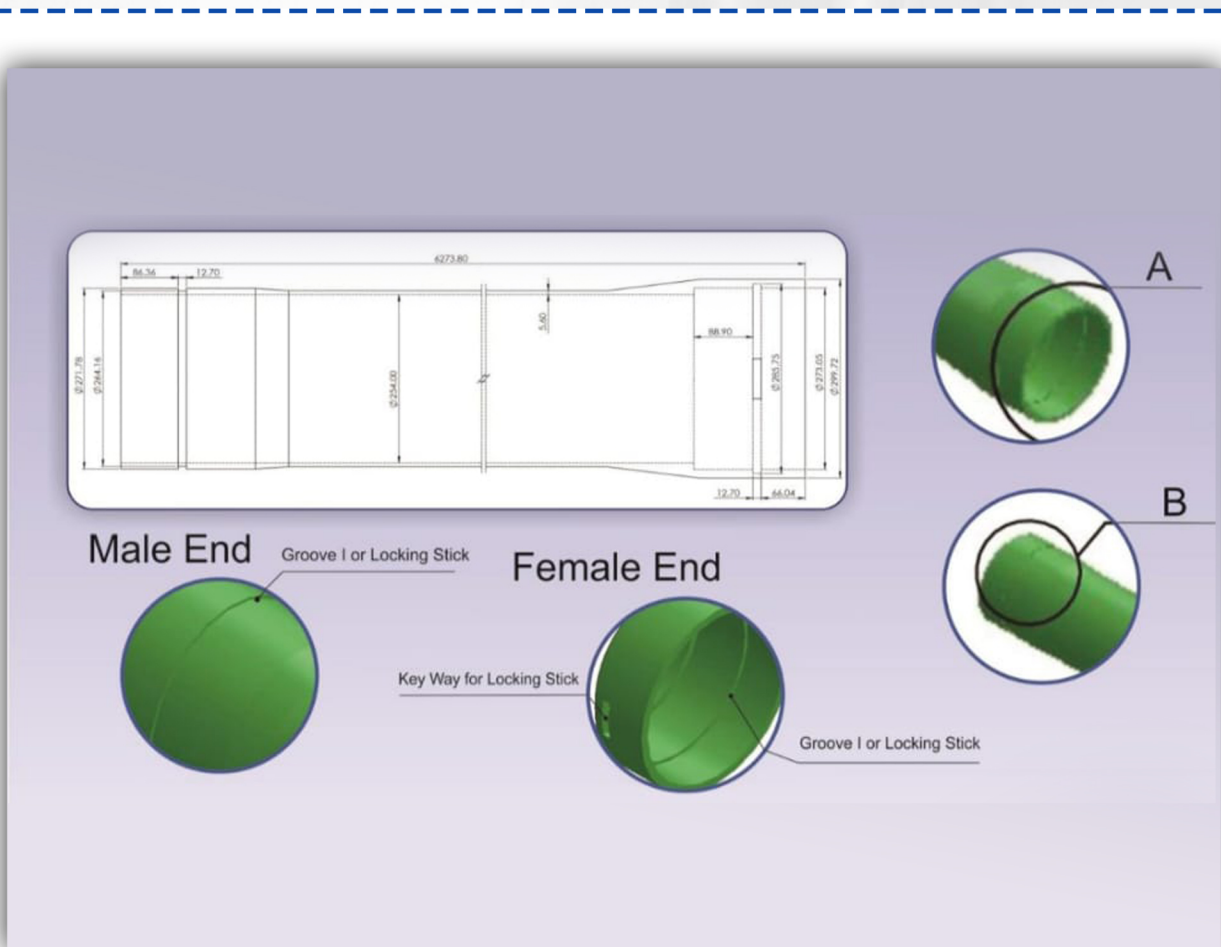


SPECIFICATIONS

- Resin system: Thermosetting Epoxy Resins
- Reinforcement: Type "E" single end, continuous filament fiberglass roving
- Curing Systems: Infra-red radiation, enclosed oven for initial curing
- Standard Diameters: 6", 8", 10", 12", 14", 16" & 18" in Blank & Strainer
- Standard Length: Normal 20' (6 Mtr) & 10' (3 Mtr)



DETAIL OF BLANK PIPE



STANDARDS

WWFG can design, calculate, fabricate, and test the composite products according to international standards.



TESTING FACILITIES

ASTM STANDARDS

- Hydro static Pressure ASTM D 2992
- Diametrical Deflection ASTM D 2412
- Impact Testing ASTM 2444
- Axial Tensile Pipe & Coupling ASTM D638
- Glass to resin ratio ASTM D2584
- Water Absorption

WAPDA Standards

Nominal Pipe	Type	Min Axial Tension (Lbs)	Axial Compression (Lbs)	Minimum Wall Thickness
150	Blank	27,000	27,000	4.5mm
200	Blank	27,000	27,000	5.0mm
250	Blank	27,000	47,000	6.0mm
150	Filter	27,000	27,000	5.0mm
250	Blank	27,000	27,000	6.0mm
150	Filter	27,000	47,000	6.35mm

MATERIALS

GRE composite products derive strength from the raw materials used.

The mechanical strength of pipe and fittings depends upon the type, amount, and positioning of glass fibers, while the desired chemical and thermal properties of the product are based upon the epoxy resin matrix used.

Filament wound GRE products use continuous glass strands as the reinforcement, with the most suitable fiber (tex), surface sizing systems, and bonded in the epoxy resin matrix of the highest quality.

Diametrical Strengths of Fiberglass

Nominal Pipe (DIA)	Type	Diametrical Compression Post-Boil (Kgs)	Diametrical Compression Pre-Boil (Kgs)
150	Blank	25,000	2,000
200	Blank	13,000	1,400
250	Blank	13,000	1,400
150	Filter	25,000	2,000
200	Filter	13,000	1,040
250	Filter	13,000	1,040

Comparison of Materials for Tube-Well Pipes

Property	Mild Steel	Brass	P.V.C	Fiberglass Epoxy
Diameters Available	6" to 20"	6" to 10"	4" to 12"	6" to 18"
Operational Life Expectancy	8-10	5-6	5-8	25 Plus
Joining Method	Electric Welding	Threaded Socket	PVC Solution	Bell & Spigot joint Nylon Strip key lock
Open Area % (S)	7% to 10%	Manual slotting. No precision or uniformity 6% to 8%	Hardly up to 6% open Area Possible	High precision slotting with diamond disk. Can penetrate from 7% to 12%
Reducer's Option	Reducer's Open Available	Molded Reducers Available	No Reducers Option Available	All Size of Reducers Available
Ease of Lowering	Electric welding Retrieval/Salvage almost zero	Gas welding difficult. Lowering Minimum. Salvage negligible	PVC/Rubber Solution	Very Easy at site Lowering without any collapsing. T&P 100% retrievable
Electrostatic Action/Protection	Electrostatic action is unavoidable. Vulnerable to choking of slots	Electrostatic action is and early choking of entire filter in short time	No electrostatic action but due to collapsing, freshness slots may cause entire filter choking	Fiberglass being inert material is free from any electrostatic action. No pressure bonding of slots and no corrosion/fungus deposition and no foreign materials