FACT
Fiberglass & Composite Technology

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1.1 Receipt, Handling and Inspection

1.1.1 Transportation

- Domestic U.S.A. or Inland Shipments require dedicated (Fiberglass Only) flat bed trailers.). We do not recommend pipe hanging off trailer or transporting pipe on racks above a small rack that can cause potential impact damage on pipe. Tie downs should be located near the dunnage. Do not use chains (Straps Only).
- International Shipments require dedicated (Fiberglass Only) 40’ open top or high cube containers loaded at factory.
- Containers should not be unloaded at port of destination. If the container can not be transported inland the pipe will need to be crated at factory. Crates can be installed inside of containers for removal at the port of destination and then transported inland.

1.1.2 Load Inspection

- Check quantities for deviation.
- Look for load shifting, missing dunnage or thread protectors.
- Look for excessive bending from over-tightening straps.
- Check for impact damage caused from abrasion or blow with sharp object.
- Quarantine or mark any joints that appear damaged, do not install.

1.1.3 Unloading

- Forklifts are commonly used for off-loading bundles, use a spotter to avoid damaging.
- Use spreader bar and slings for off-loading with a crane.
- Never allow pipe to roll off trailer to racks or ground

1.1.4 Storage

- Set pipe on a surface free of sharp rocks.
- Leave the separator boards between the pipe layers.
- If pipe racks are used, strip them with lumber and evenly space four to avoid permanent bending, make sure pipe is protected to prevent damage from sharp edges.

- Thread protectors must remain in place to prevent damage and UV exposure.

1.1.5 Ultraviolet Effects

- Ultraviolet effects on pipe are limited to surface discoloration. Eventually, “Fiberblooming” will occur if left exposed to the sun long enough, but degradation is limited to only the outer .005”-.010” wall of the pipe. The surface effect of ultraviolet is minimal and does not reduce the long term performance of our products.

1.2 Product Selection

1.2.1 Packer Selection

- F.A.C.T. tubing is designed to be set in tension. Double Grip Packers are preferred with an on/off tool seal assembly, 1/4 turn release. Direct tension Packers should be avoided due to the movement of fiberglass. Direct Set Packers are ran with a steel work ring if ≥3500 feet deep. Hydraulic Set Packers are not recommended due to uncontrollable forces
- Polished Bore Receptacles are run with proper precautions to avoid compression. While temporary compression must be avoided since the pipe can become cracked from buckling.

1.2.2 Rod Pump Wells

- It is preferred that the tubing is anchored and rod guides must be used.

1.2.3 Electrical Submersible Pumps (ESP)

- Care must be given to direction and amount of start-up torque. Anchoring is recommended. Since the connection diameter of fiberglass is different than steel, the cable size and weight must be evaluated.

1.2.4 Landing Joint

- Slip type well heads must be sized correctly, it is good practice to use heavy wall jump size diameter landing joints.

1.2.5 Blow Out Preventers (BOP)

- Annular type preventers are recommended.
- Prior to Ram BOP closure, to prevent damage to the pipe, care must be taken to ensure the pipe OD is not larger than the ID of the Ram blocks. Since the Rams may cause some physical damage to the fiberglass tubing, it is recommended that any joint that is closed in the BOP be discarded or marked as such and not used in the string.

1.2.6 Testing Tubing

- F.A.C.T. recommends the placement of a seating nipple above the packer. Always drop a standing valve to the seating nipple and test the tubing internally prior to pulling the string if the tubing is suspected of leaking. Do not rely on annulus tests to qualify a leak in F.A.C.T. tubing.

1.3 Preparation Prior to Running the Tubing

1.3.1 Elevator Selection

- F.A.C.T. Integral joint tubing uses a Slip Type Elevator. Remove setting plate since fiberglass upset O.D. is greater than steel. Rubber setting plates are recommended to minimize marking and improve fit. Use shorter bolts to hold slips in place.
- The elevator size for F.A.C.T. tubing is one size greater as compared to steel. Example 2 3/8" tubing-2 7/8" elevator.
- The elevator model for 2 3/8"-2 7/8" is MYT, and 3 1/2"- 4 1/2" is YT.
- Make sure slip I.D. will work against the tubing. It is recommended practice to check the bottom of bowl I.D. against O.D. of the fiberglass box or coupling for clearance. Use tall bowl with long slips for better weight distribution across slips. If string weight is more than 20,000 lbs. use two sets of elevators. One elevator will replace slips to support fiberglass while other set is used to pick up and lower the next joint.

1.3.2 Wrench Selection

- All F.A.C.T. tubing joints are recommended to be made up with manual strap wrenches that apply even torque over the circumference of the build up area of the tubing connection.

- Power tongs may be used if equipped with automatic computer controlled load measuring equipment on the tie back line to control maximum torque. Typical rig tongs are not recommended.

1.3.3 Thread Sealant

- FACT sealants have been formulated and tested to achieve the best performance of our products. Any other sealants have not been approved by FACT.
- F.A.C.T. Tubing Sealant is a petroleum based sealant formulated with Teflon particulate to enhance sealing properties as well as superior friction resistance.

1.3.4 Crossovers to Steel Connections

- Fiberglass threads are long form type and most steel equipment use short form threads, which will reduce the thread engagement and physical properties of the connection. (Note: It is necessary to have long form steel connection to match fiberglass for optimum performance.).

1.3.5 Rig Alignment

- Rig alignment is essential for proper installation of F.A.C.T. tubing. Pulling the pipe over the hole is not a good practice and leads to cross-threading, thread wear or damage due to excessive torque during make-up.

1.4 Handling Instructions

1.4.1 Pick-Up and Handling

- Keep thread protectors on until ready for make-up
- Manually carry the tubing to the floor.
- Attach the elevators to the tubing.
- Tail each joint; do not drag as it is lifted.
- Excessive wind may require a Derrick Man for the stabilizing and alignment.

1.5 Make-Up Procedure

1.5.1 Connection Preparation

- Clean the connection pin and box with wire brush.
- Apply to both pin and box an even coat of F.A.C.T. approved thread sealant with a typical dope brush. (Make sure roots of threads are coated on both pin and box.

1.5.2 Connection Make-Up

- Gently lower pin into box until engagement is felt then rotate by hand.
- If the joint seizes up, back it out, inspect for damaged threads, re-lubricate and repeat make-up procedure.
- The final make-up will be made up by one man and a F.A.C.T. torque wrench. (Power Tongs may be used in accordance with the following table).
- The strap wrench will occasionally slip when applying torque. Abrasive powder can be applied to the strap to prevent slippage.

1.5.3 Torque Requirements

THREAD SIZE	TORQUE	FULL MAKE-UP	LUBRICANT
	OPTIMUM	STAND-OFF	JOINTS/GALLON
2 3/8”	175 ft-lb.	1-3	100
2 7/8 “	200 ft-lb.	1-3	80
3 1/2 “	250 ft-lb.	1-3	65
4 1/2”	350 ft-lb.	1-3	35

1.5.4Make-Up Precautions

- Do not over-torque, damage can occur due to over-torque.
- Typical power tong back-ups can be used on upset of the integral joint. Excessive damage can occur if used on the pipe body.
- Never use typical pipe wrenches on fiberglass tubulars.
- Spiders, slips and elevators should be cleaned frequently and slip inserts should be kept sharp.

1.5.5 Lowering Tubing

- Proceed slowly; avoid obstructions and abrupt stops which can result in dynamic tensile loadings.

- Compressive strength should not exceed 75% of the tensile rating.
- Reaching total depth, stacking out or setting down temporary is common, use caution setting down heavily.
- Stop tubing motion prior to setting slips.

1.6 Setting Tension for F.A.C.T. Tubing

1.6.1 Stretch factor based on 1,000 lb. tensile load per 1,000 ft. See table below:

TUBING SIZE	2 3/8”	2 7/8”	3 1/2”	4 1/2”
Stretch (in/lb. ft.)	2.29	1.73	1.21	.94

1.7 Landing Tubing at Well Head

1.7.1 Threaded Flange Well Head

- Remove the flange from the well head as the extra weight will cause damage to the fiberglass thread.
- Check threads for compatibility before installation

1.7.2 O-Ring Well Head

- Check threads for compatibility before installation.

1.7.3 Slip Type Well Head

- Fiberglass landing joints must be sized for the setting range of the slips which are designed for steel.

1.8 **Limited Warranty and Exclusions.** F.A.C.T. warrants products manufactured and sold by it will be free from defects in material and workmanship at time of delivery. This warranty extends only to the original purchaser from F.A.C.T. or a F.A.C.T. authorized commercial reseller. Any product defect must be reported to F.A.C.T. within thirty days following delivery to the purchaser and the product promptly made available to F.A.C.T. for inspection upon request. The purchaser's sole remedy in the event of defect shall be replacement of the defective product with new comparable product without charge to the purchaser with shipping to be paid by F.A.C.T.

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