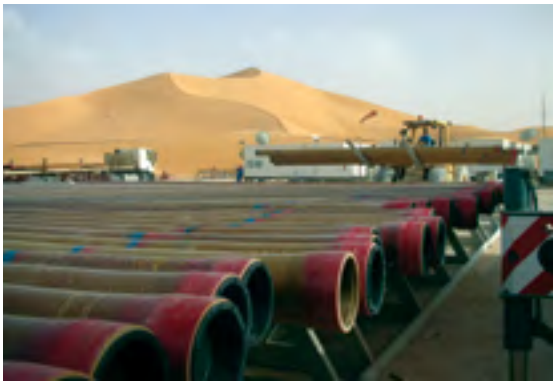
Glass-Reinforced Epoxy High Pressure Products

GEOSTRONG™ REDBOX® and BLUEBOX®
FLOWSTRONG® YELLOWBOX® and GREENBOX®



For Products Manufactured in The United States of America

FUTURE PIPE INDUSTRIES

www.futurepipe.com

Glass-Reinforced Epoxy

Glass Reinforced Epoxy (GRE) is a high-strength, corrosion-resistant material created by combining glass fibers with epoxy resin. It is engineered to endure harsh environments and offers exceptional performance in a wide range of applications, including offshore and onshore piping and pipelines. Its inherent corrosion resistance significantly reduces maintenance costs and extends the service life of the infrastructure.

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Who We Are and What We Do

Connecting Life. Delivering a Sustainable Future.

At Future Pipe Industries, we're pioneers in composite pipe solutions. We offer an unmatched range across diverse sectors, using advanced glass fiber technology for superior durability, corrosion resistance, and a reduced carbon footprint.

With 40+ years of global expertise, we're the trusted partner for complex projects across industries. We're not just meeting standards - we're shaping the future with innovative, sustainable solutions.

At Future Pipe Industries, we maintain the highest standards for quality and safety in composite pipe solutions. Serving a wide range of sectors such as Water & Infrastructure, Energy & Power, Chemical & Industrial, and Marine & Offshore, we provide tailored solutions that meet evolving industry needs.

Our legacy is built on excellence, and we're shaping a future where composites lead the way in sustainability and innovation.

Our Global Presence

Middle East

5 factories:
UAE (Dubai, Abu Dhabi), Oman, KSA, Qatar

9 sales offices:
2 in UAE (Dubai, Abu Dhabi), Qatar,
3 in KSA (Dammam, Jeddah & Riyadh),
Oman, Turkey, Lebanon

Europe

1 factory:
The Netherlands

6 sales offices:
France, United Kingdom, Italy, Germany, Spain, The Netherlands

Africa

2 factories:
Egypt, Morocco

3 sales offices:
Egypt, Morocco, Algeria

North America

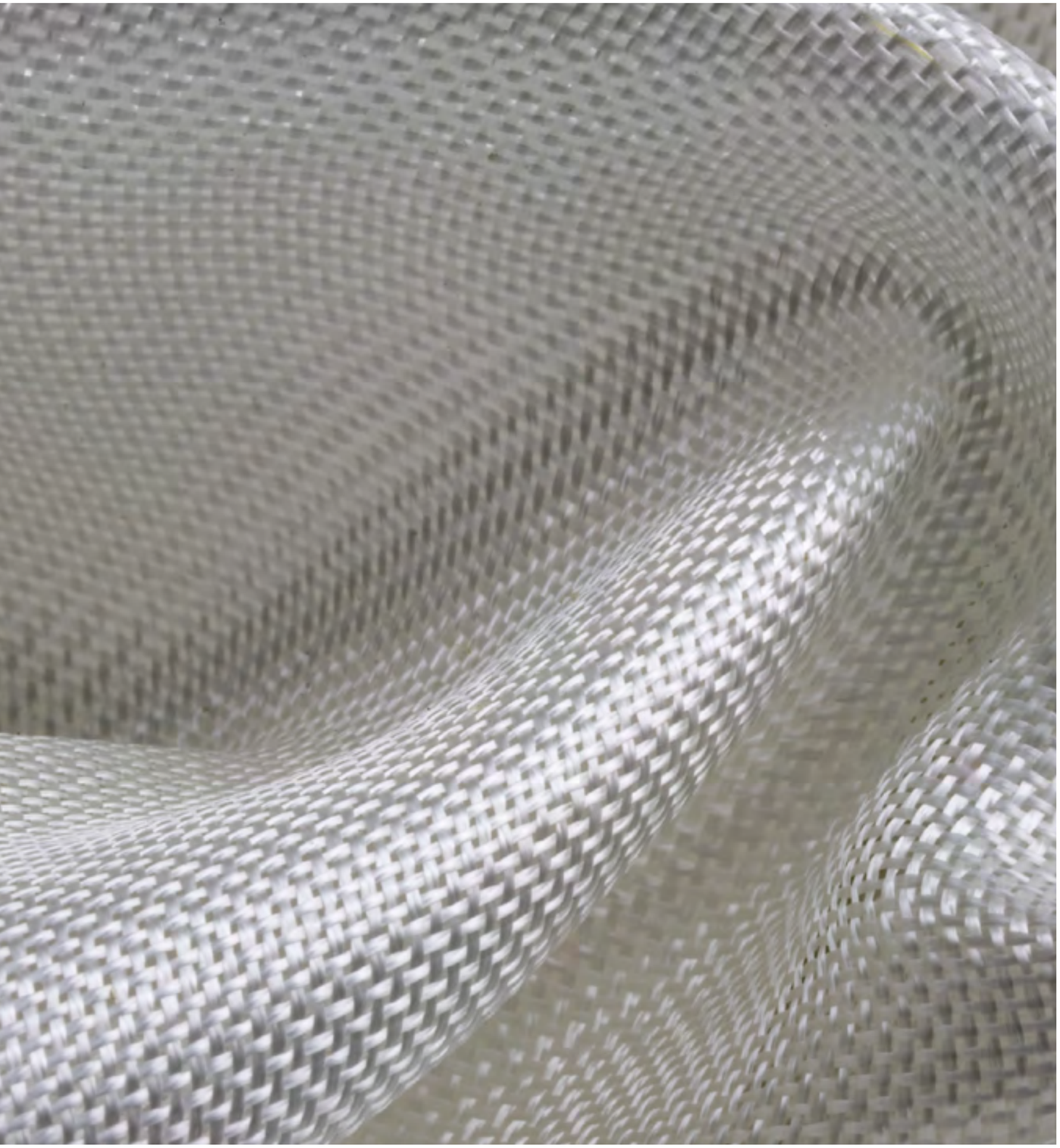
2 factories:
US (Texas, Louisiana)

2 sales offices:
US (Texas, Louisiana)

Asia

1 factory:
Indonesia

5 sales offices:
Indonesia, India, Singapore, South Korea, Malaysia



Why Composites?

Durable & lightweight
Our composite pipes feature a high strength-to-weight ratio, reducing transportation and installation costs compared to traditional steel or concrete solutions

Anti-corrosive & resistant
Exceptionally resistant to harsh environments, our composites withstand corrosion from soils, saltwater, H2S, and chemicals, ensuring a longer-lasting pipeline

Longer lifecycle
Built for longevity, our composite pipes offer over 50 years of durability, providing a cost-effective solution with extended system lifecycles far beyond traditional materials.

Versatile & accomodating
Our solutions easily handle high pressures, temperatures, and loads, offering flexible assembly options for complex configurations while maintaining chemical resistance.

Cost effective & efficient
Surpassing other traditional materials in hydraulic performance, our solutions drastically reduce operating expenses. Plus, with shorter lead times and streamlined supply chains, they offer unmatched cost-effectiveness.

Sustainable
Our composite solutions offer a significant reduction in carbon emissions compared to metal-based pipe. Due to the lighter weight of composite products, we demonstrate tangible reductions in each product's carbon footprint. This translates to lower Scope 3 emissions for our customers, aiding them in meeting their climate objectives.

Manufacturing Process

Helical Filament Winding Process

Pipes are produced using the helical (reciprocal) filament winding process by which impregnated glass fiber reinforcement with resin are applied onto a precision steel mandrel in a prescribed pattern. Repeated application of wetted fibers results in a multi-layered structural wall construction of the required thickness.

At Future Pipe Industries, we're pioneers in composite pipe solutions. We offer an unmatched range across diverse sectors, using advanced glass fiber technology for superior durability, corrosion resistance, and a reduced carbon footprint.

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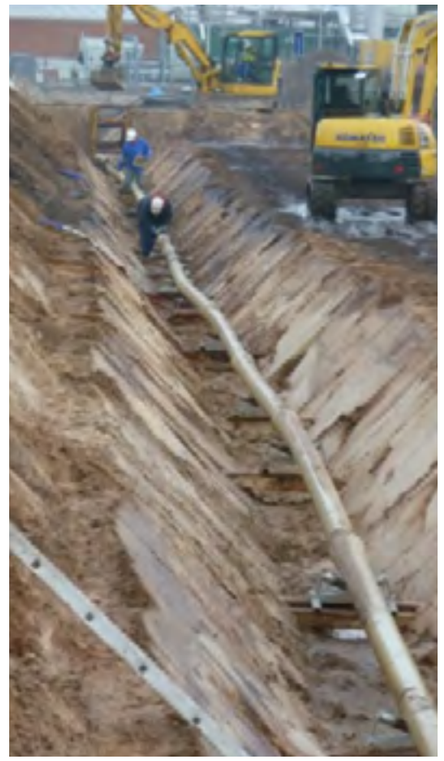
Our legacy is built on excellence, and we're shaping a future where composites lead the way in sustainability and innovation.

Glass-Reinforced Epoxy Applications



Glass Reinforced Epoxy (GRE) is a high-strength, corrosion-resistant material created by combining glass fibers with epoxy resin. It is engineered to endure harsh environments and offers exceptional performance in a wide range of applications, including offshore and onshore piping and pipelines. Its inherent corrosion resistance significantly reduces maintenance costs and extends the service life of the infrastructure.

Accreditations

Future Pipe Industries is accredited for the following.

- The Quality Management System (ISO 9001:2015 and API Q1 9th Edition)
- The American Petroleum Institute API 15HR Certificate that provides the specifications for a safe, dimensionally and functionally interchangeable high pressure glass fiber line pipe to meet the requirements for performance, design, materials, testing, inspection, marking, handling, storing and shipping

QMS REGISTERED

Certificate of Registration

APIQR® REGISTRATION NUMBER

0005

This certifies that the quality management system of

FUTURE PIPE INDUSTRIES INC
11811 Proctor Road
Houston, TX
United States

has been assessed by the American Petroleum Institute Quality Registrar (APIQR®) and found it to be in conformance with the following standard:

ISO 9001:2015

The scope of this registration and the approved quality management system applies to the

Design and Manufacture of High Pressure Fiberglass Tubulars

APIQR® approves the organization's justification for excluding:

8.5.1(f) Validation and Periodic Revalidation of Processes

Effective Date: SEPTEMBER 26, 2024
Expiration Date: JUNE 8, 2027
Registered Since: SEPTEMBER 26, 2024

Senior Vice President of Global Industry Services

API American Petroleum Institute

REGISTRATION NO. Q1-1359

Certificate of Registration

The American Petroleum Institute certifies that the quality management system of

FUTURE PIPE INDUSTRIES INC
11811 Proctor Road
Houston, TX
United States

has been assessed by the American Petroleum Institute and found to be in conformance with the following:

API Spec Q1, 9th Edition

The scope of this registration and the approved quality management system applies to the

Design and Manufacture of High Pressure Fiberglass Tubulars

API approves the organization's justification for excluding:

Servicing; Validation of Processes

Effective Date: JUNE 8, 2024
Expiration Date: JUNE 8, 2027
Registered Since: AUGUST 3, 2011

Senior Vice President of Global Industry Services

Q1 API Spec Q1 Registered

Certificate of Authority to use the Official API Monogram

License Number: 15HR-0006 **ORIGINAL**

The American Petroleum Institute hereby grants to

FUTURE PIPE INDUSTRIES INC
11811 Proctor Road
Houston, TX
United States

the right to use the Official API Monogram® on manufactured products under the conditions in the official publications of the American Petroleum Institute entitled API Spec Q1® and **API-15HR** and in accordance with the provisions of the License Agreement.

In all cases where the Official API Monogram is applied, the API Monogram shall be used in conjunction with this certificate number: **15HR-0006**

The American Petroleum Institute reserves the right to revoke this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following: Fiberglass Line Pipe

American Petroleum Institute

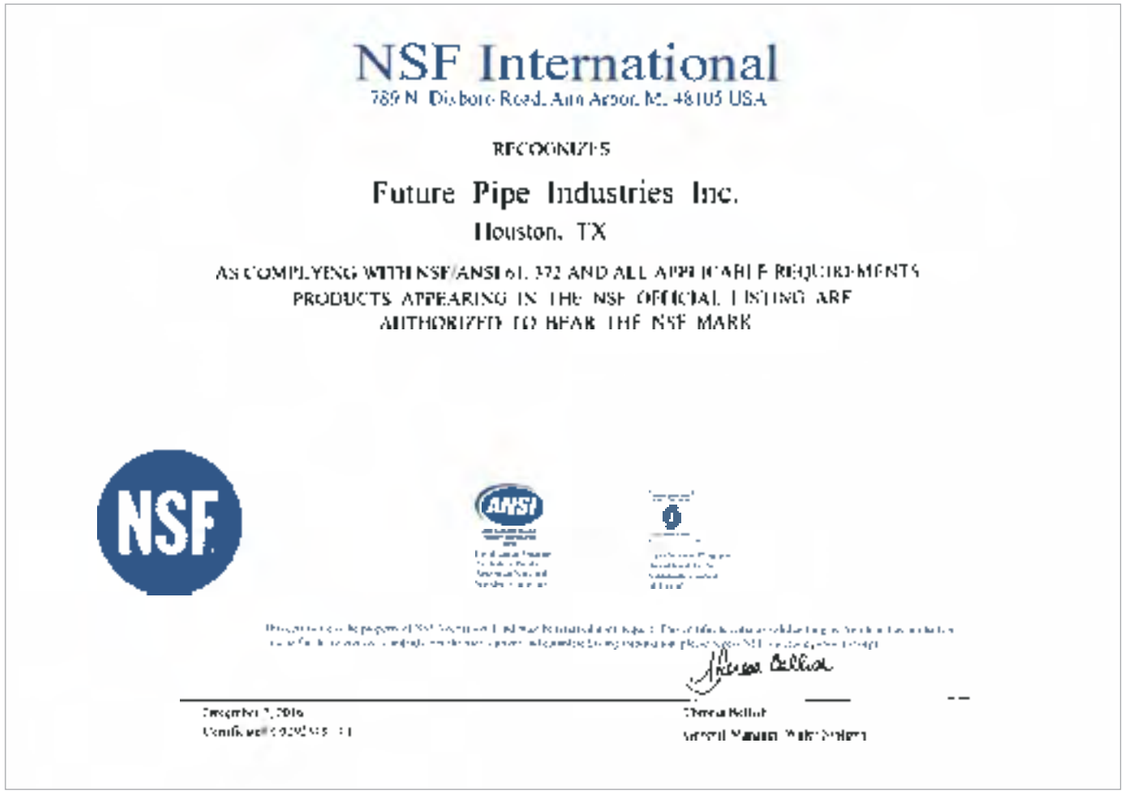
CORPORATE SEAL

QMS Exclusions: Servicing; Validation of Processes

Effective Date: JUNE 8, 2024
Expiration Date: JUNE 8, 2027

To verify the authenticity of this license, go to www.api.org/compositelist.

Senior Vice President of Global Industry Services



NSF International

789 N. Dixboro Road, Ann Arbor, MI 48105 USA

RECOGNIZES

Future Pipe Industries Inc.

Houston, TX

AS COMPLYING WITH NSF/ANSI 61, 372 AND ALL APPLICABLE REQUIREMENTS
PRODUCTS APPEARING IN THE NSF OFFICIAL LISTING ARE
AUTHORIZED TO BEAR THE NSF MARK

NSF

ANSI

December 7, 2016

Theresa Bellish

General Manager, Water Systems

Chemical Resistance Guide

Industrial pipe systems have to meet high standards of performance with respect to temperature and chemical resistance. In most piping applications involving corrosive service, glass fiber reinforced epoxy pipe systems are the best choice.

They are durable and resistant to an exceptionally wide range of corrosive chemicals and environments.

The information provided in this section will guide you through the chemical resistance tables of glass fiber reinforced epoxy pipe systems.

The data of this guide are based on more than 40 years of field experience in which field and laboratory testing has indicated good expected service life. However, it should be noted that combinations of chemicals, heat, flow rate, the presence of solids, and other considerations can influence a material's corrosion resistance capacity. Therefore, this corrosion resistance guide is to be considered as a recommendation and not a guarantee.

Service life and corrosion resistance in an aggressive chemical environment depends on the total wall thickness, the chemical type and concentration, the service temperature, the duration of use, and the type of product:

- Flowstrong® Yellow Box® Line Pipe and Geostrong™ Red Box® Tubing & Casing Products (without Nexus liner)
- Green Box® Line Pipe and Geostrong™ Blue Box® Tubing & Casing (with Nexus liner) For the chemical resistance tables, the following should be noted:
- In cases where NR is listed, this means that the chemical specified is not recommended for usage.
- The temperature figure indicates the maximum allowable temperature limit.
- In cases where a concentration is listed, this figure means the maximum concentration limit.

For chemicals, mixtures of chemicals, or actual operating conditions not mentioned in the following tables, or circumstances wherein only "trace" quantities of NR listed chemicals are present. Please consult Future Pipe Industries before deciding on the suitability of glass fiber epoxy pipe systems for an application.

Nexus® Liner is synthetic surfacing veils that provide an improved longevity and physical property performance to FRP composites, due to the proven corrosion resistant performance.

Nexus® is specified to be used as the first layer of protection in an FRP corrosion barrier, Nexus® will help to provide much longer service life to FRP products with chemicals under high temperature.

CHEMICAL	Max Operating Temperature F°	
	Without Liner	With Liner*
Acetic Acid 10%	150	200
Acetic Acid-75%	100	120
Acetic Acid-Glacial	NR	NR
Acetone	NR	120
Acrylic Acid	NR	100
Adipic Acid, Solution	200	200
Air	210	230
Alcohol, Ethyl	150	150
Alcohol, Isopropyl	150	150
Alcohol, Methyl	150	150
Alcohol, Methyl Isobutyl	150	150
Alcohol, Secondary Butyl	150	150
Allyl Chloride	100	100
Aluminum Chloride	200	230
Aluminum Fluoride	100	150
Aluminum Hydroxide	100	150
Aluminum Nitrate	200	230
Aluminum Sulfate	200	230
Alum	200	230
Ammonia Gas-Dry	150	230
Ammonia-Wet	NR	100
Ammonium Carbonate	100	150
Ammonium Chloride	200	230
Ammonium Fluoride-25%	100	150
Ammonium Hydroxide-10%	100	150
Ammonium Hydroxide-28%	NR	100
Ammonium Nitrate	200	230
Ammonium Persulfate	NR	100
Ammonium Phosphate	150	150
Ammonium Sulfate	200	230
Amyl Acetate	NR	100
Amyl Chloride	NR	100
Aniline	NR	100
Barium Carbonate	200	230
Barium Chloride	200	230
Barium Hydroxide-10%	200	230
Barium Sulfate	200	230
Barium Sulfide	200	230

CHEMICAL	Max Operating Temperature F°	
	Without Liner	With Liner*
Benzene	100	150
Benzene Sulfonic Acid	NR	100
Benzoic Acid	NR	100
Borax	200	230
Boric Acid	150	200
Bromic Acid	100	150
Bromine	NR	NR
Butadine	100	100
Butane	100	100
Butyl Acetate	NR	100
Butyl Cellosolve	150	150
Butyric Acid-50%	150	150
Calcium Bisulfite	200	200
Calcium Carbonate	200	230
Calcium Chlorate	200	200
Calcium Chloride	200	230
Calcium Hydroxide-50%	200	200
Calcium Hypochlorite-20%	NR	NR
Calcium Nitrate	200	230
Calcium Sulfate	200	230
Carbon Bisulfide	NR	NR
Carbon Dioxide	200	230
Carbon Tetrachloride	100	150
Carbonic Acid	150	200
Castor Oil	200	200
Chlorine	NR	NR
Clorinated Water 0-3000 Ppm	150	230
Chloroacetic Acid-25%	100	120
Chlorobenzene	100	150
Chloroform	NR	100
Chromic Acid-10%	NR	150
Chromic Fluoride	NR	100
Citric Acid	200	230
Copper Chloride	200	230
Copper Fluoride	200	230
Copper Nitrate	200	230
Copper Sulfate	200	200
Crude Oil-Sour, Sweet	200	230

*Green Box® chemical grade line pipe and Geostrong™ Blue Box® chemical grade tubing and casing Products are offered with Nexus Liner

CHEMICAL	Max Operating Temperature F°	
	Without Liner	With Liner*
Diacetone Alcohol	150	150
Dimethylamine	NR	NR
O-Dichlorobenzene	100	150
Dichloroethylene	NR	100
Diethylene Triamine	NR	NR
Ethyl Acetate	NR	150
Ethyl Cellosolve	NR	100
Ethyl Chloride	NR	100
Ethyl Ether	NR	100
Ethyl Chlorohydrin	NR	NR
Ethyl Diamine	NR	NR
Ethyl Glycol	200	200
Ethylene Oxide	NR	NR
Fatty Acids	200	200
Ferric Chloride	150	230
Ferric Nitrate	200	230
Ferric Sulfate	200	200
Ferrous Chloride	200	230
Ferrous Sulfate	200	200
Fluorosilicic Acid-10%	200	200
Formaldehyde-40%	NR	100
Formic Acid-25%	NR	100
Freon	NR	150
Gas-Natural	200	230
Gasoline-Sour	200	230
Gasoline-Refined, All Grades	150	150
Glucose	200	230
Glycerine	200	230
Glycol, Ethylene	200	200
Glycol, Propylene	200	230
Heptane	150	150
Hexane	NR	100
Hexylene Glycol Alcohol	150	150
Hydraulic Fluid	200	200
Hydrobromic Acid-50%	NR	150
Hydrochloric Acid-35%	100	150
Hydrocyanic Acid-10%	NR	NR
Hydrofluoric Acid	NR	NR

CHEMICAL	Max Operating Temperature F°	
	Without Liner	With Liner*
Hydrogen	150	150
Hydrogen Peroxide-10%	NR	150
Hydrogen Peroxide-30%	NR	75
Hydrogen Sulfide	150	200
Hypochlorous Acid-10%	200	200
Jet Fuel	150	200
Kerosene	200	230
Lactic Acid	150	200
Lauric Acid	200	200
Lead Acetate	200	230
Levulinic Acid-25%	200	200
Magnesium Carbonate	200	230
Magnesium Chloride	200	230
Magnesium Hydroxide	120	200
Magnesium Nitrate	200	230
Magnesium Sulfate	200	230
Maleic Acid	150	150
Mercury	200	230
Methane	200	230
Methyl Ethyl Ketone	NR	100
Methyl Isobutyl Carbitol	NR	100
Methyl Isobutyl Ketone	100	150
Mineral Oils	200	230
Naptha	200	200
Napthalene	150	150
Natural Gas	200	230
Nickel Chloride	200	230
Nickel Nitrate	200	200
Nitric Acid-10%	NR	100
Oil, Sour, Crude	200	230
Oleic Acid	200	200
Oxalic Acid	200	200
Perchloric Acid-70%	NR	100
Phenol-5%	NR	150
Phosphoric Acid-50%	NR	150
Phosphorous Pentoxide-50%	NR	100
Pickling Acid	NR	120
Plating Solution	200	230

*Green Box® chemical grade line pipe and Geostrong™ Blue Box® chemical grade tubing and casing Products are offered with Nexus Liner

CHEMICAL	Max Operating Temperature F°	
	Without Liner	With Liner*
Potassium Bicarbonate	200	230
Potassium Bromide	200	200
Potassium Carbonate	200	230
Potassium Chloride	200	230
Potassium Dichromate	200	230
Potassium Hydroxide	100	200
Potassium Nitrate	200	230
Potassium Permanganate-5%	150	200
Potassium Permanganate-10%	NR	150
Potassium Sulfate	150	200
Propane	100	100
Silicic Acid	200	200
Silver Nitrate	200	200
Sodium Acetate	200	200
Sodium Bicarbonate	200	230
Sodium Bisulfate	200	230
Sodium Bromide	200	200
Sodium Carbonate	150	200
Sodium Chlorate	200	230
Sodium Chloride	200	230
Sodium Cyanide	200	230
Sodium Dichromate	200	230
Sodium Ferrocyanide	200	230
Sodium Fluoride	200	230
Sodium Hydroxide	100	150
Sodium Hypochlorite	NR	NR
Sodium Methoxide-40%	100	150
Sodium Nitrate	200	230

CHEMICAL	Max Operating Temperature F°	
	Without Liner	With Liner*
Sodium Peroxide	NR	75
Sodium Phosphate	200	200
Sodium Silicate	150	150
Sodium Sulfate	200	230
Sodium Sulfite	200	200
Sodium Thiosulfate	150	150
Stannic Chloride	200	230
Stearic Acid	150	150
Sulfur Dioxide	NR	150
Sulfuric Acid-25%	NR	150
Sulfuric Acid-70%	NR	100
Sulfurous Acid-5%	NR	150
Tannic Acid	200	200
Tartaric Acid	200	230
Toluene	NR	150
Trichloroacetic Acid	NR	NR
Trichloroethylene-100%	100	150
Triethylamine	NR	100
Trisodium Phosphate	150	150
Turpentine	NR	100
Urea	150	150
Vinyl Acetate	NR	150
Water-Distilled, Deionized	200	230
Water-Fresh, Ph 2-13	200	230
Water-Salt, Brine	200	230
Xylene	150	150
Zinc Chloride	200	230
Zinc Sulfate	200	230

*Green Box® chemical grade line pipe and Geostrong™ Blue Box® chemical grade tubing and casing Products are offered with Nexus Liner

Flow Rate Charts

The following Flow Rate Charts are based on Darcy-Weisbach Equation: The Darcy-Weisbach equation states that pressure drop is proportional to the square of the velocity and the length of the pipe. It is inversely proportional to the diameter of the pipe.

Hf = fL (v2)/2(ID)g
Where:
Hf = Pressure Head Losses
f = Friction Factor
V = fluid velocity, ft/s
ID = Pipe Inside Diameter

The friction factor can be determined from the Moody diagram found in most fluid mechanics
$1/ft^{0.5}$ =-2 log [(e/ID) /3.7] + 2.51/(Re) ($ft^{0.5}$)
Where:
ft = Moody friction factor
e = surface roughness parameter
= 1.7×10^{-5} for glass fiber pipe

The flow rate charts provided are for Brine Water, Crude Oil and Fresh Water. All other fluids with different specific gravity (S.G.) and viscosity (CPS), please consult with Future Pipe Industries.

How to use the Flow Rate Chart:
There are four parameters used in the flow rate chart for any fluid, three parameters must be known in order to calculate the fourth parameter. The four parameters are the following:

- Pipe Diameter (d) = Pipe nominal diameter in inches
- Internal Operating Pressure (P) = Pipe internal pressure in psi
- Flow Rate (Q) = Volumetric flow rate (barrels per day or gallons per minute)
- Line Pipe Length (L) = Total length of line pipe in feet

Example:
Flow line transmitting Brine water with no elevation changes

Given (Input)
Fluid type Brine water
Internal operating pressure = 1750 psi Flow rate = 10,000 barrels per day Total line pipe length = 20 miles

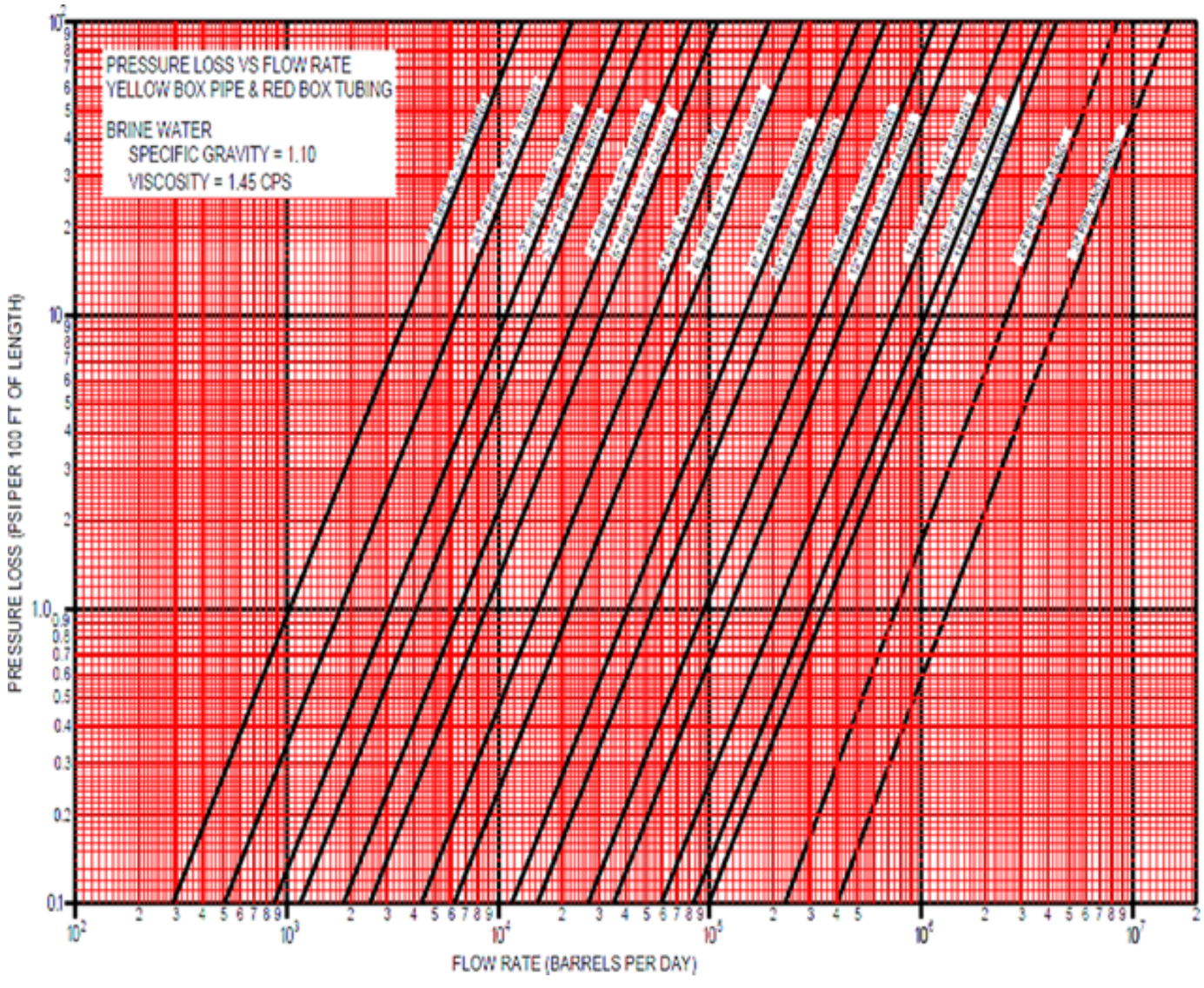
Required (Output)
Pipe diameter (D) Steps:

1- Convert the Line pipe length into feet = 20 x 5280 = 105,600 feet
2- Calculate the Pressure Loss (psi per 100 feet of length) =

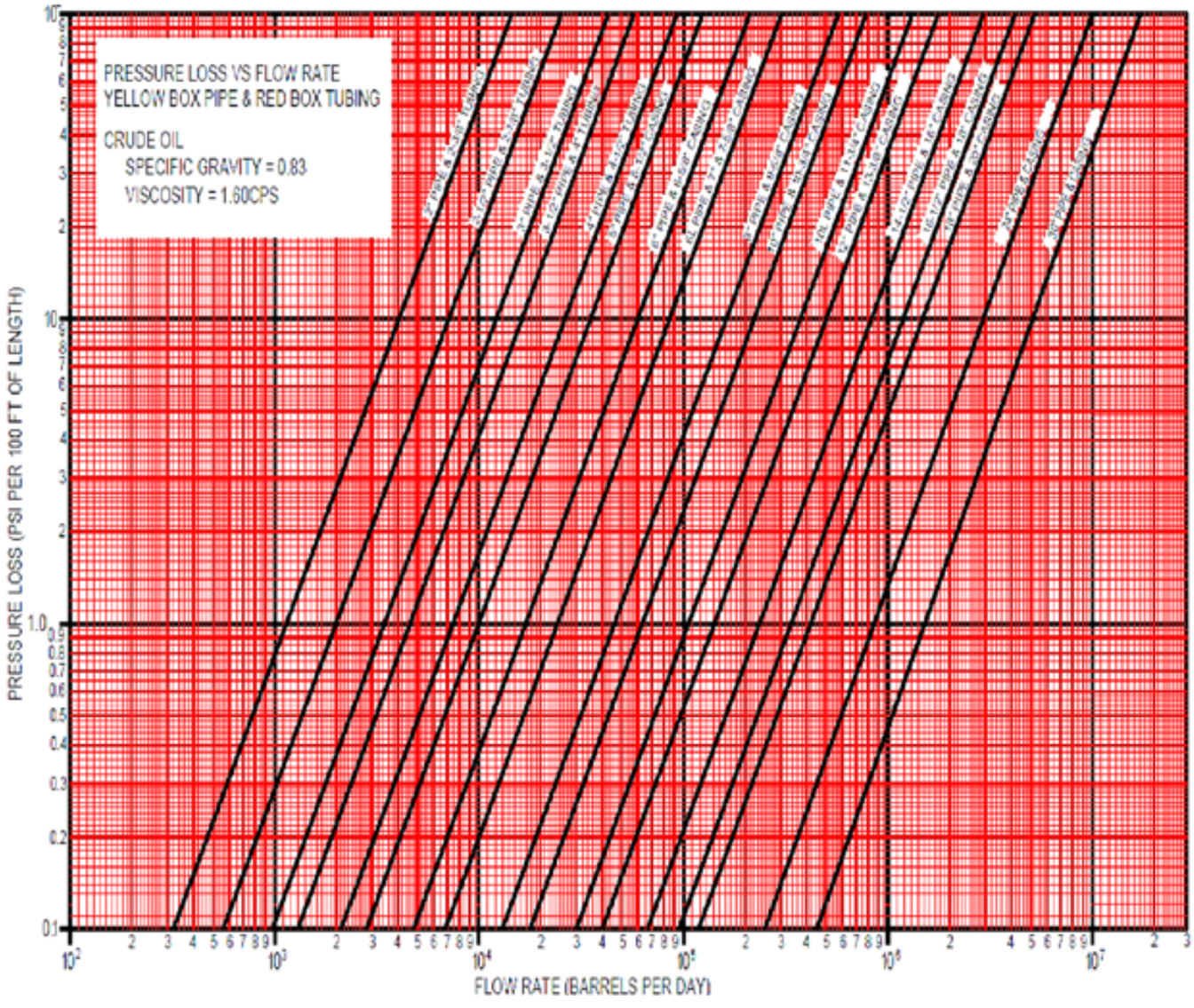
$$\frac{1750*100}{105600} = 1.66$$

3- Draw a horizontal line at the pressure loss value of 1.66 on the vertical log scale
4- Draw a vertical line at the flow rate value of 10,000 (10^4) on the horizontal log scale
5- The Intersection of the two lines will be between 4" pipe and 5" pipe, round up to the next size pipe. Use D = 5"

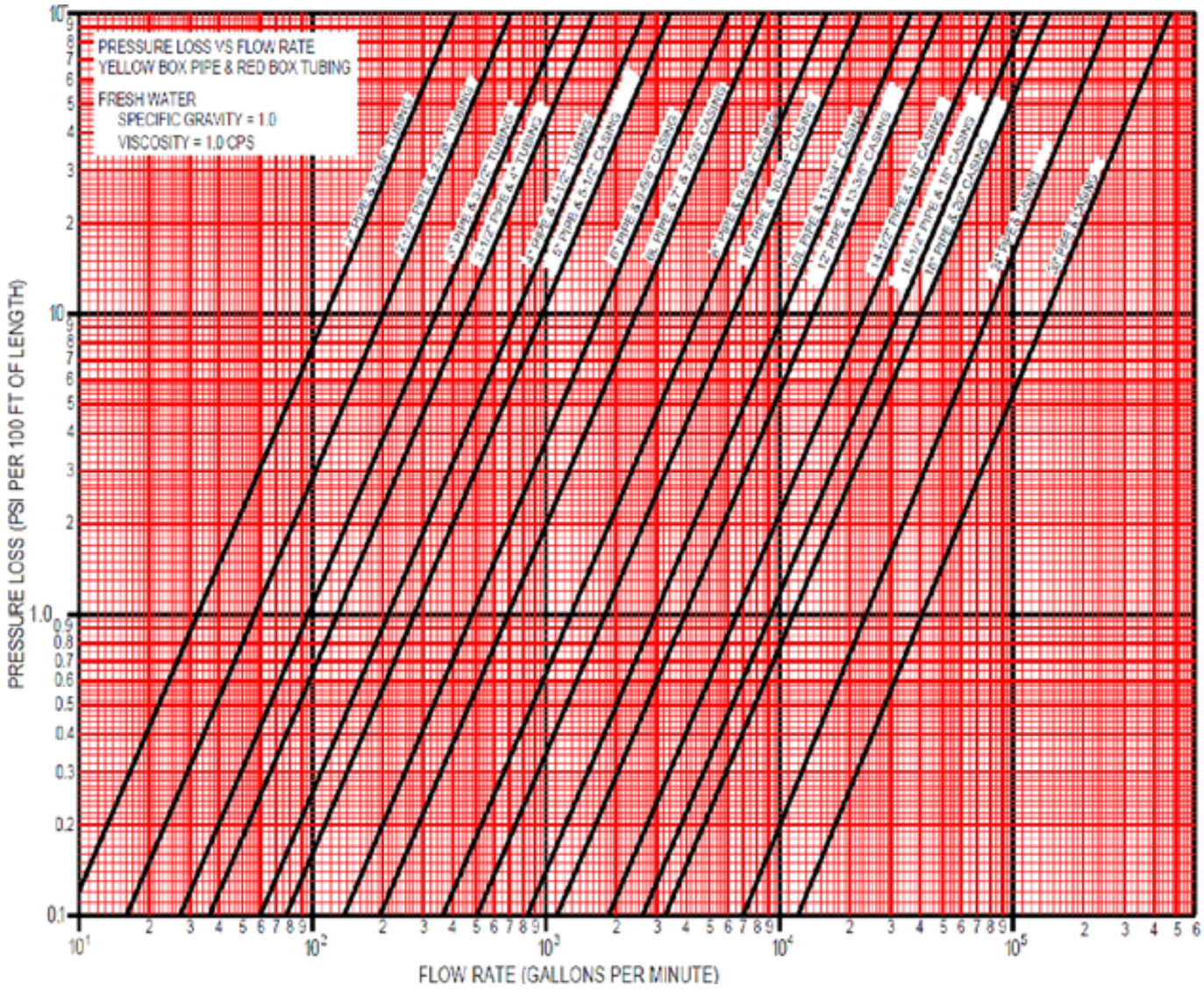
Brine Water



Crude Oil



Fresh Water


PRESSURE LOSS VS FLOW RATE
YELLOW BOX PIPE & RED BOX TUBING
FRESH WATER
SPECIFIC GRAVITY = 1.0
VISCOSITY = 1.0 CPS
PRESSURE LOSS (PSI PER 100 FT OF LENGTH)
FLOW RATE (GALLONS PER MINUTE)

Line Pipe

Flowstrong® Yellow Box® Standard
Line Pipe

Flowstrong® Yellow Box® API 15HR DESIGN
Line Pipe

Green Box®
Chemical Grade Line Pipe

Flowstrong®
Composition and Specifications

Flowstrong® Yellow Box® Standard, Yellow Box® API 15HR Design, and Green Box® Line Pipe is a machine-made composite material produced by the filament winding method combining high strength glass fiber filaments and corrosion resistant epoxy resin, especially formulated to result in a structurally and chemically optimum product. The epoxy resin is an aromatic amine cured system that has the highest mechanical strength, thermal resistance and best corrosion resistance of all commercially available resin systems used in the fabrication of glass fiber piping.

Line Pipe conforms to the following ASTM Specifications: ASTM D 2310 – 01
Yellow Box® Designation: RTRP-11AX
Green Box® Designation: RTRP-11FX ASTM D 2996 – 01
Yellow Box® Designation: RTRP-11AX1-3221
Green Box® Designation: RTRP-11FX1-3221

Line Pipe can be supplied with API Specification 15HR monogram, under API license number 15HR-0006. The Future Pipe Industries, Inc.'s Quality Management System is certified to be in compliance with ISO-9001:2015, API Q1 and ANAB

Uses and Applications

Flowstrong® Yellow Box® Standard, Flowstrong® Yellow Box® API 15HR Design, and Green Box® Line Pipe glass fiber reinforced aromatic amine cured epoxy resin line pipe is designed for medium to high pressure oilfield and industrial service.

Line Pipe is available in 500, 750, 800, 1000, 1250, 1500, 1750, 2000, 2250, 2500, 2750, 3000 psi static operating pressure ratings.

Any requirements below 1000 psi will be standardized to a default pressure rating of 1000 psi.

Line Pipe offers a high-strength, non-corroding line pipe system in 2 through 24 inch sizes that has a proven low installed cost due to its light weight and threaded connections.

Section 6.1 and 6.2 include the technical data sheets for all the sizes available with each pressure class. Please consult Future Pipe Industries for larger diameters not listed on each specified pressure class.

Line Pipe system is recommended for use in:

- Salt water injection, water flood lines
- Medium to high pressure transmission lines
- CO2 injection and recovery lines
- Crude oil and gas flow lines, gathering systems
- Chemical effluent and waste disposal lines
- Water distribution systems

Joining System and Fittings

Flowstrong® Yellow Box® Standard, Flowstrong® Yellow Box® API 15HR Design, and Green Box™ Line Pipe products are connected with the reliable, time proven API- 5B threaded connection. For pipe size 2" to 4", an 8 Rd (API-5B) external upset end (EUE) long threaded connections is used. For pipe size 5" and up, an 8 Rd (API-5B), 4 Rd casing long and casing short threaded connection are used. Dependent on pipe size, filament wound integral joint (IJ) or couplings (TC) are utilized in the connection.

Line Pipe is offered with a line of fittings including elbows, tees, couplings and flanges.

Advantages

Design:
- Manufactured from aromatic-amine, heat-cured epoxy resin which provides the highest mechanical strength combined with the maximum chemical and temperature resistance available for glass fiber pipe systems.
- Manufactured using the filament winding method for greater mechanical strength.
- All FPI glass fiber products are extensively heat cured to provide consistent and repeatable quality.
- Available in the highest-pressure ratings in the industry.
- Suitable for a temperature range of -60°C (-76°F) to +95°C (+200°F)1.
- No concerns over the cyclic pressure changes.
- Long term reliability. Designed for service life of 20 years or more.

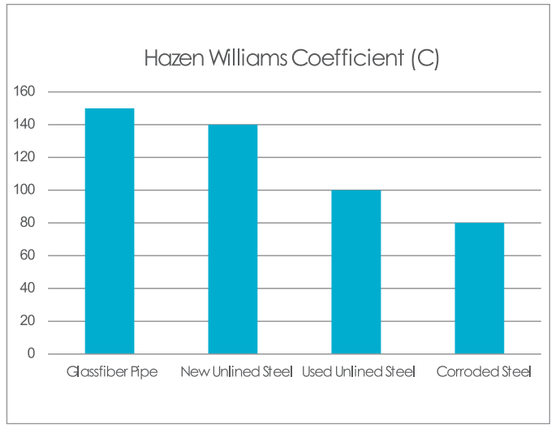
Connection:
- Joint sealing is obtained by glass fiber material itself. Hence, use of other sealing material such as rubber O-rings is completely avoided.

Hydraulic Performance:
- Low friction losses. Minimum Hazen-Williams coefficient (C) of 150 over the entire life time for typical oil & gas services.
- Reduced paraffin and scale build-up.

Chemical Resistance:
- No external corrosion from aggressive soils and ground water.
- Resists internal corrosion from brackish water, H2S, CO2, and most oilfield fluids
- Outstanding broad spectrum corrosion resistance.

Quality:
- Fully compliant with API standards.
- FPI does not conduct random sampling testing. Every joint of pipe is pressure tested from 1.3 to 1.5 times the design pressure.

Shipping & Installation:
- Light weight, safe, easy & fast installation.
- Minimal maintenance, no coating or cathodic protection is required.
- Low transportation and installation cost.
- Less excavation, fewer, and small crew compare to steel pipe.



[1]For applications with a design temperature greater than 95°C (200° F), contact Future Pipe Industries to obtain a suitable de-rating factor.

For Technical Data Sheets please refer to Appendix section.

Flowstrong® Green Box®
Chemical Grade Line Pipe

Product Description
The Green Box® product consists of the Yellow Box® product with an inner Nexus® liner to achieve more chemical resistance. Refer to Chemical Resistance Guide in Section 3.0

Product Availability
The Green Box® products are available with the integral joint (IJ) connection type only. Product can be selected by using the Yellow Box® or Yellow Box® API 15HR Design Criteria product Technical data sheets in Sections 6.1 and 6.2.

Example
Find the maximum nominal size Line pipe to carry water mixed with Hydrogen Sulfide under internal pressure of 1250 psi and operating temperature of 165 F

Steps
1- Check Section 3.0, from the chemical resistance guide tables for the Hydrogen Sulfide with the operating temperature of 165 F. The two options are a- Yellow Box® product without liner with maximum operating temperature of 150 F (Not suitable) b- Green Box® product with liner with maximum operating temperature of 200 F
2- Select the Green Box® product with the Nexus® liner
3- Check Section 6.1 or 6.2 and select the Yellow Box® 1250 Technical Data Sheet
4- The maximum nominal size for the Green Box® line pipe with Integral joint connection type is 10 inches

Tubing & Casing

Geostrong™ Red Box®
Tubing & Casing

Geostrong™ Blue Box®
Chemical Grade Tubing & Casing

Geostrong™
Composition and Specifications

Geostrong™ Red Box® and Geostrong™ Blue Box® Tubing and casing is of a machine-made composite material, produced by the filament-winding method, combining high strength glass fiber filaments and corrosion resistant epoxy resin specially formulated to result in a structurally and chemically optimum product. The epoxy resin is an aromatic amine cured system that has the highest mechanical strength, thermal resistance and best corrosion resistance of all commercially available resin systems used in the fabrication of glass fiber piping.

Future Pipe Industries, Inc.'s Quality Management System is certified to be in compliance with ISO-9001:2015, API Q1 and ANAB.

Tubing and casing pipe conforms to the following ASTM Specifications:
ASTM D 2310 – 01
Geostrong™ Red Box® size (2-3/8 - 10-3/4) Designation: RTRP-11AX
Geostrong™ Red Box® size (11-3/4 - 24) Designation: RTRP-11AX
Geostrong™ Blue Box® size (2-3/8 - 10-3/4) Designation: RTRP-11FX
Geostrong™ Blue Box® size (11-3/4 - 24) Designation: RTRP-11FX

ASTM D 2996 – 01
Geostrong™ Red Box® size (2-3/8 - 10-3/4) Designation: RTRP-11AX1-2332
Geostrong™ Red Box® size (11-3/4 - 24) Designation: RTRP-11AX1-3222
Geostrong™ Blue Box® size (2-3/8 - 10-3/4) Designation: RTRP-11FX1-2332
Geostrong™ Blue Box® size (11-3/4 - 24) Designation: RTRP-11FX1-3222

Uses and Applications

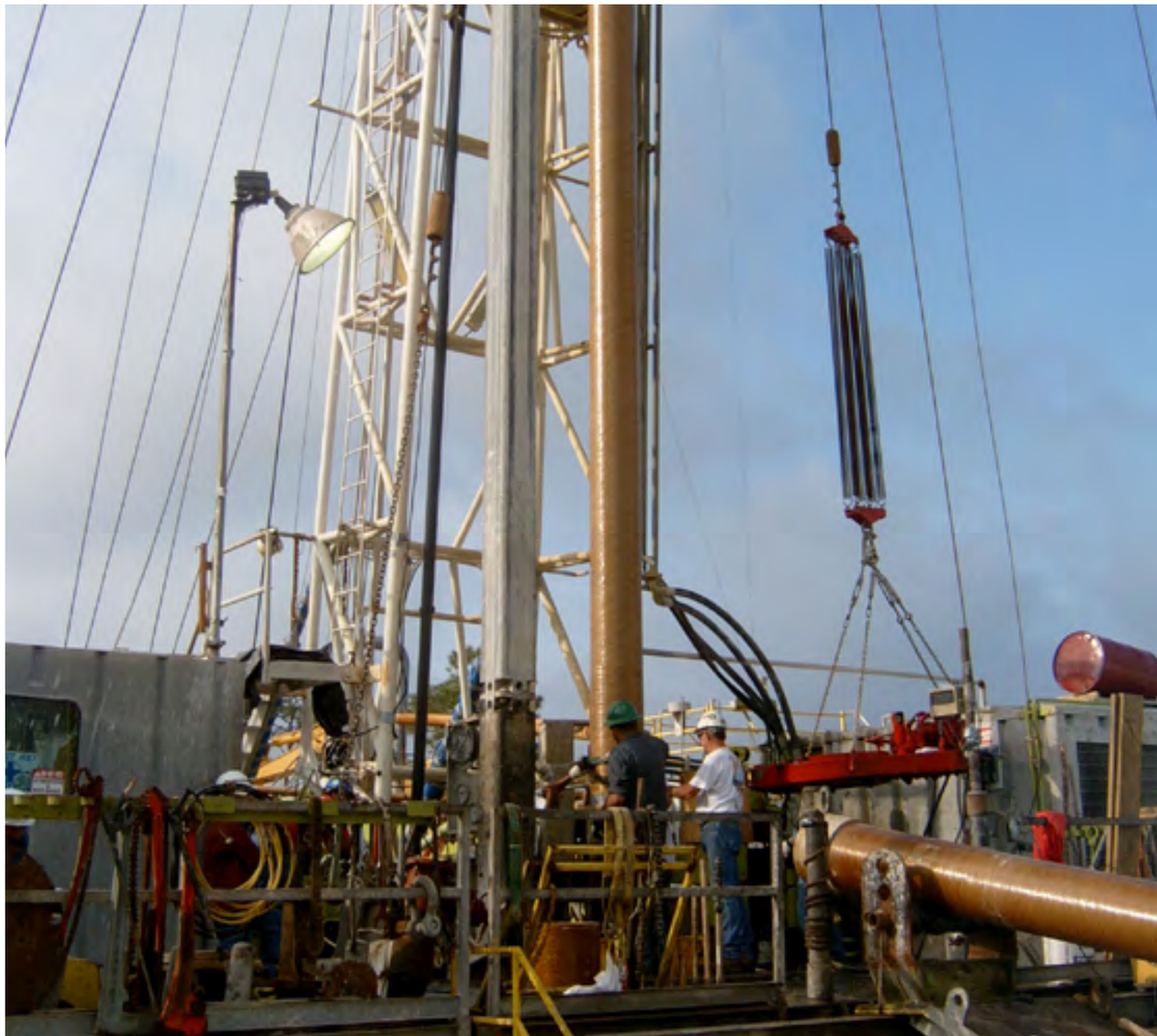
Geostrong™ Red Box® And Geostrong™ Blue Box® Tubing and casing is a glass fiber reinforced aromatic amine cured epoxy resin casing and tubing designed for down hole service of medium to high pressure at depths as great as 12,000 feet.

Tubing and casing is available in 1000, 1250, 1500, 1750, 2000, 2250, 2500, 2750 and 3000 psi operating pressure ratings.

Any requirements below 1000 psi will be standardized to a default pressure rating of 1000 psi.

The tubing and casing system offers high-strength, corrosion-resistant performance in sizes ranging from 2-3/8 inches to 24 inches, ensuring a proven low installation cost and extended lifespan.

Tubing and casing system is recommended for use in:
- Production wells (oil, gas, thermal)
- Disposal wells (salt water, chemical effluent, and waste)
- Injection wells (salt water, CO2)
- Liners for the repair of corroded steel casing
- Municipal and commercial water wells



Joining System and Fittings

Geostrong™ Red Box® and Geostrong™ Blue Box® Tubing and casing products are connected with the reliable, time proven API-5B threaded connection. For pipe size 2" to 4", an 8 Rd (API-5B) external upset end (EUE) long threaded connections is used. For pipe size 5" and up, an 8 Rd (API-5B), 4 Rd casing long and casing short threaded connection are used. Dependent on pipe size, filament wound integral joint (IJ) or couplings (TC) are utilized in the connection.

Tubing and casing systems are offered with a line of fittings and accessories including centralizers and slotted screens.

Advantages

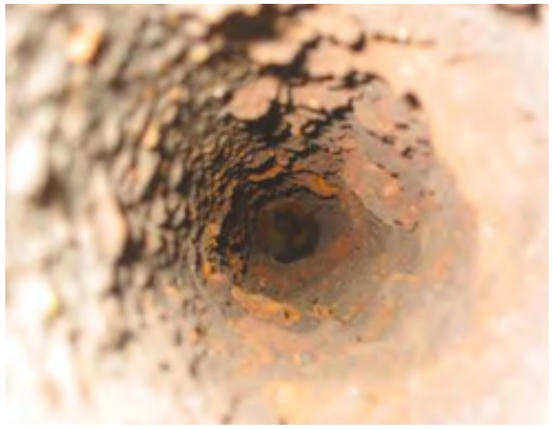
Design:
- Manufactured from aromatic-amine, heat-cured epoxy resin which provides the highest mechanical strength combined with the maximum chemical and temperature resistance available for glass fiber pipe systems.
- Manufactured using the filament winding method for greater mechanical strength.
- All FPI glass fiber products are extensively heat cured to provide consistent and repeatable quality.
- Available in the highest-pressure ratings in the industry.
- Suitable for a temperature range of -60°C (-76°F) to +95°C (+200°F)2.
- No concerns over the cyclic pressure changes.
- Long term reliability. Designed for service life of 20 years or more.

Connection:
- Joint sealing is obtained by the glass fiber material with thread compound. Hence, use of other sealing material such as rubber O-rings is completely avoided.

Hydraulic Performance:
- Low friction losses. Minimum Hazen-Williams coefficient (C) of 150 over the entire life time for typical oil & gas services.
- Reduced paraffin and scale build-up. Chemical Resistance:
- No external corrosion from aggressive soils and ground water.
- Resists internal corrosion from brackish water, H2S, CO2, and most oilfield fluids
- Outstanding broad spectrum corrosion resistance.

Quality:
- Fully compliant with API 15HR and 5B standards.
- FPI does not conduct random sampling testing. Every joint of pipe is pressure tested from 1.3 to 1.5 times the design pressure.

Shipping & Installation:
- Light weight, safe, easy & fast installation.
- Minimal maintenance, no coating or cathodic protection is required.
- Low transportation and installation cost.



[2]For applications with a design temperature greater than 95°C (200° F), contact Future Pipe Industries to obtain a suitable de-rating factor.

For Technical Data Sheets please refer to Appendix section.

Geostrong™ Blue Box®
Chemical Grade Tubing & Casing

Product Description

The Geostrong™ Blue Box® product consists of the Geostrong™ Blue Box® product with an inner Nexus® liner to achieve more chemical resistance.

Refer to Chemical Resistance Guide in Section 3.0

Product Availability

The Geostrong™ Blue Box® products are available with the integral joint (IJ) connection type only. Product can be selected by using the Geostrong™ RED BOX® product technical data sheets in Section 8.1

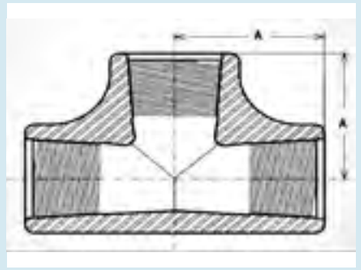
Example

Find the maximum nominal size tubing for water well production, fluid contains chlorinated water (2000 PPM). The tubing shall have a collapse rating of 2900 psi (equivalent to internal pressure of 2500 psi) and maximum operating temperature of 165 F

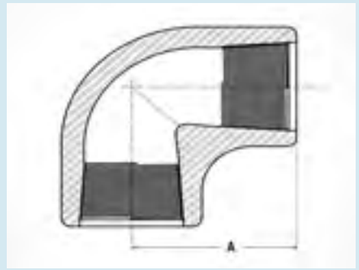
Steps:

1- Check Section 3.0, from the chemical resistance guide tables for the chlorinated water with the operating temperature of 165 F. The two options are a- Geostrong™ Red Box® product without liner with maximum operating temperature of 150 F (Not suitable) b- Geostrong™ Blue Box® product with liner with maximum operating temperature of 230 F
2- Select the Geostrong™ Blue Box® product with the Nexus® liner
3- Check Section 9.1, select the Geostrong™ Red Box® 2500 Technical Data Sheet
4- The maximum nominal size for the Geostrong™ BLUE BOX® tubing with Integral joint connection type is 7 inches

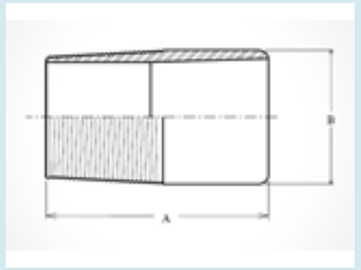
Fittings



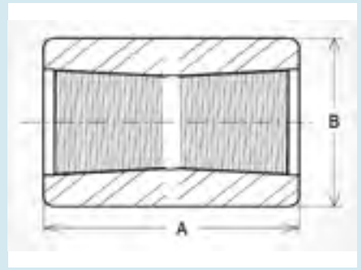
Tee



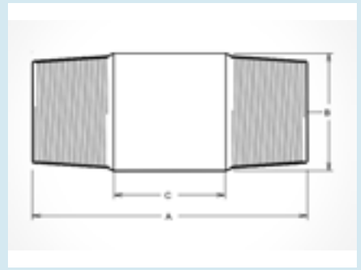
Elbow



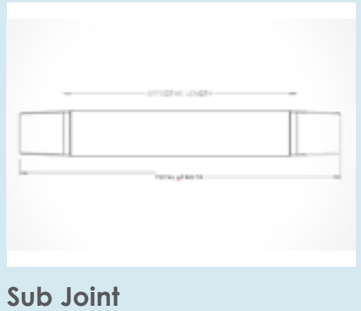
Field Thread



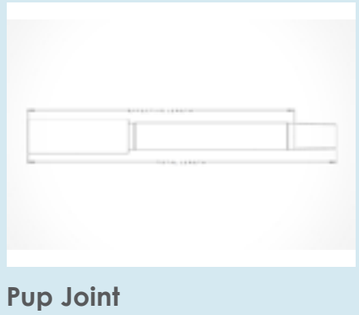
Coupling



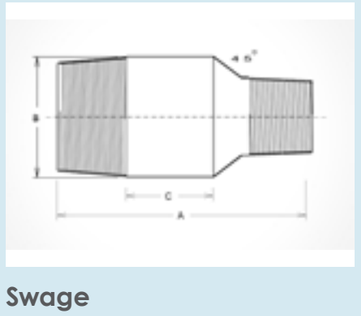
Nipple



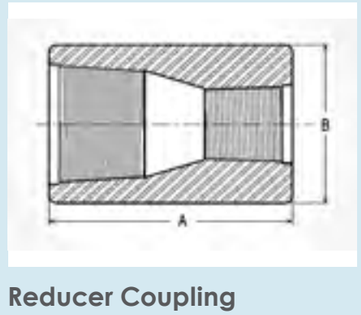
Sub Joint



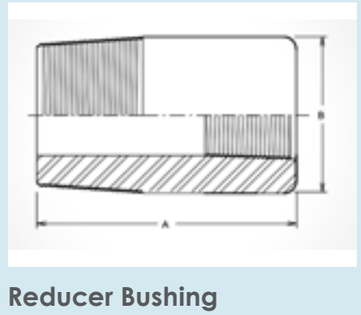
Pup Joint



Swage



Reducer Coupling



Reducer Bushing

Future Pipe Industries, Inc. manufactures and sells a complete line of glass fiber fittings in sizes corresponding to the pipe sizes offered. The drawings contained in the following catalogue section detail the dimensional specifications for the fittings listed below:

Line Pipe Fittings
Tee
Elbow 90°
Elbow 45°
Field Thread

Please contact Future Pipe industries for Elbow 11.25°, Elbow 22.5°, and any other elbow with custom angle.

Line Pipe, Tubing & Casing Fittings
ANSI 150 Flat Face Flange
ANSI 300 Flat Face Flange
ANSI 600 Flat Face Flange
ANSI 900 Flat Face Flange
ANSI 1500 Flat Face Flange
Coupling
Nipple
Sub Joint
Pup Joint
Swage
Reducer Coupling
Reducer Bushing

Please contact Future Pipe industries for other ANSI flanges not listed.

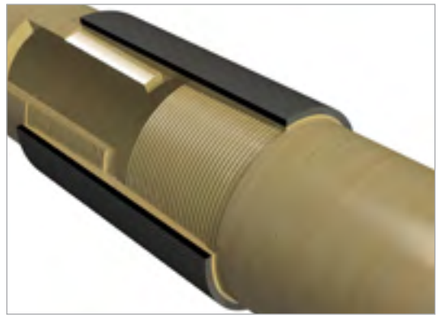
Special Products, Features and Services

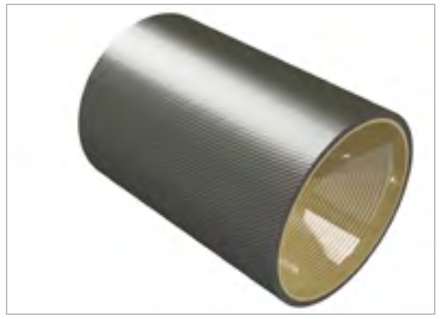
Hybrid Carbon/Glass Fiber Coupler

Designed to excel in challenging conditions, hybrid couplers bring together the best qualities of carbon fiber and glass fiber. Carbon fiber ensures exceptional strength and rigidity, reducing the outer diameter (OD) of the coupler for enhanced downhole compatibility. Meanwhile, the glass fiber component provides excellent electrical insulation properties and corrosion resistance, safeguarding the operations against harsh downhole conditions.

Key Benefits

- Carbon fiber construction allows for a smaller OD without compromising strength.
- Accommodates diverse downhole applications with space constraints or specific wellbore requirements.
- Compact design enables drilling of smaller diameter holes, reducing operational costs.
- Drilling smaller diameter holes leads to significant cost savings. Reduces material usage, drilling time, and environmental impact.
- Carbon fiber and glass fiber hybrid construction ensures robustness and longevity.





Special Products

- **Down-hole Crossover Joints.**
  In addition to the typical fitting type of crossover, full or partial length crossover joints are available for mixed string down-hole applications. The connections on these crossovers are as per tubing or casing of the same size and all performance capabilities of the main string are maintained.

- **Epoxy Kits.**
  Complete epoxy kits for on-site bonding of glass fiber products are available. The kit includes epoxy, a curing agent, cleaning solution, and the required mixing and application tools.

- **Line-pipe Repair Joints.**
  Repair joints, designed to replace damaged joints in the middle of a pipeline are available in all sizes produced. The repair joint and the repair procedure are detailed in the YELLOW BOX® Line- pipe Installation section of the catalogue. Refer to section 13.11

- **Test Coupons.**
  Test coupons are available for chemical resistance monitoring and testing. The coupons are typically perforated for handling and are epoxy coated on all exposed saws cut edges.

- **Thread Compound.**
  Several types of thread compound specifically suitable for glass fiber threaded products are available. Consult Future Pipe Industries, Inc. to determine the compound best suited for a specific application.

- **Teflon Tape.**
  Teflon tape, recommended for the makeup of line pipe is available in rolls 1" wide. Consult the Installation Instructions for usage for each pipe size.

- **Flange Gaskets, Bolts, Nuts, and Washers.**
  Spiral wound Flexitallic style gaskets together with studs, nuts, and washers for each size and ratings of flange are available. Note that the bolt length for glass fiber flanges differs from that required for steel. The flange drawings in the fittings section of the catalogue can be used to determine the proper lengths required.

Customers with special requirements should feel free to propose any new of different products to be manufactured. Our business is to provide working solutions to application problems with glass fiber products, be they standard or unique.

- **Slotted Well Screens.**
  A well screen is a filtering device, for example installed on the intake portion of wells constructed in certain types of aquifers. The well screen, when properly designed, will permit water to enter the well from the aquifer but will prevent sediment from entering and, to some degree, will provide some structural support to the aquifer material.

  Geostrong™ RedBox® Casing & Tubing can be provided with customer-specified slot openings to act as a well screen.

Slot Sizing
Slot sizing is an important step in the design process. The customer will need to verify the required entrance velocity for satisfactory operation. A general rule is to keep the entrance velocity to 0.1 fps (feet per second), although the customer should determine the desired velocity for the particular application. To calculate the velocity, use the following formula:

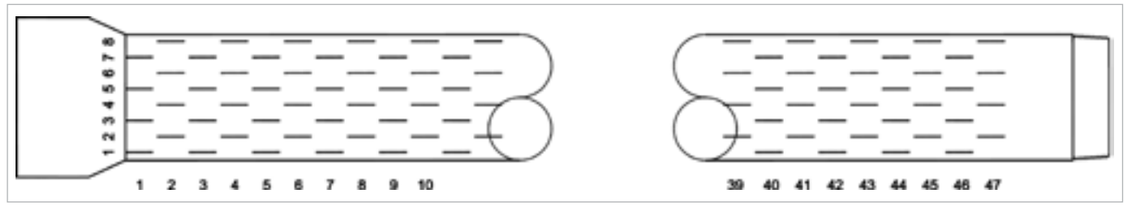
$$v = \frac{Q}{A} \times \frac{231\ \text{in.}^3}{1\ \text{gal}} \times \frac{1\ \text{min}}{60\ \text{sec}} \times \frac{1\ \text{ft}}{12\ \text{in.}}$$

where Q is the well yield in gpm (gallons per minute) and A is the total cross-sectional area of the slots.

The width of the slots is normally based on a grain-size distribution curve and size analysis of the formation.

Installation
The most common method of installation is sometimes referred to as the "pull-back" method where the casing is installed through the aquifer to the bottom of the hole. The screen is then lowered inside the casing and, when in place, the casing is pulled back to expose the well screen to the aquifer.

In what is sometimes referred to as the "single string installation", the screen is attached directly to the bottom of the casing. Normally, the well screen is the same size as the casing and thus can be threaded directly to the bottom of the casing.

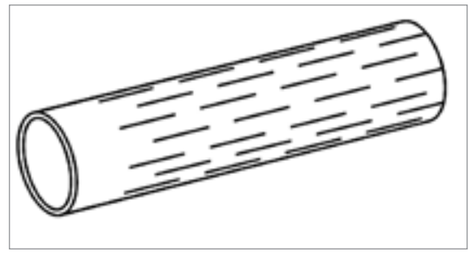


Slotted Well Screen Flow Data

Nominal Size / Thread	Open Area (in.² per stick)				Flow Rate (gpm per stick) (based on an entrance velocity of 0.1 ft/sec)			
	(0.01")	(0.02")	(0.03")	(0.058")	(0.01")	(0.02")	(0.03")	(0.058")
2-3/8	29.4	58.8	88.2	170.6	9.2	18.3	27.5	53.2
2-7/8	35.6	71.1	106.7	206.2	11.1	22.2	33.3	64.3
3-1/2	43.2	86.4	129.6	250.7	13.5	26.9	40.4	78.2
4	47.1	94.2	141.2	273.0	14.7	29.4	44.0	85.1
4-1/2	56.3	112.6	168.9	326.6	17.6	35.1	52.7	101.8
5-1/2	62.5	125.0	187.5	362.5	19.5	39.0	58.5	113.0
6-5/8	76.7	153.4	230.1	444.8	23.9	47.8	71.7	138.7
7	87.7	175.4	263.2	508.8	27.4	54.7	82.1	158.6
7-5/8	82.5	164.9	247.4	478.3	25.7	51.4	77.1	149.1
9-5/8	104.2	208.4	312.6	604.3	32.5	64.9	97.4	188.4
10-3/4	117.6	235.2	352.8	682.1	36.7	73.3	110.0	212.7
11-3/4	142.4	284.8	427.2	825.9	44.4	88.8	133.2	257.4
13-3/8	155.6	311.2	466.9	902.6	48.5	97.0	145.5	281.4

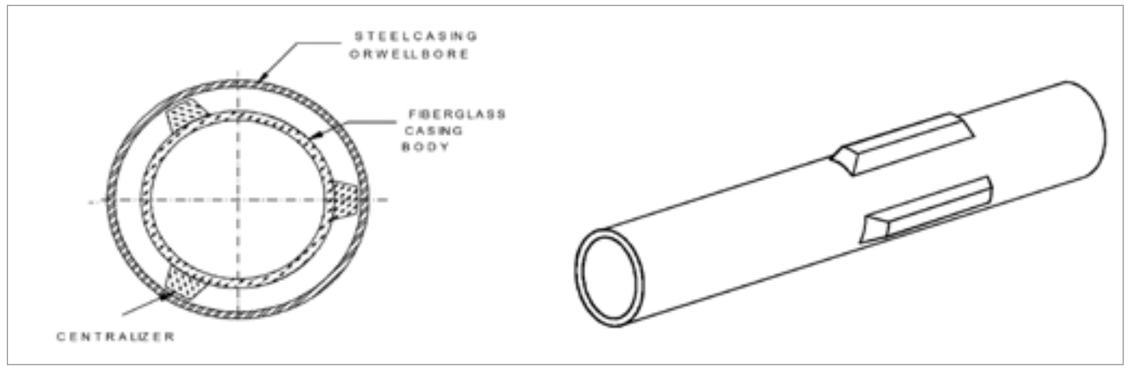
Slotted Well Screen Dimensions

Nominal Size / Thread	Pipe I.D. (in.)	Slotted Length (ft per stick)	Slots per Screen
2-3/8	2.000	26.0	975 (13 x 75)
2-7/8	2.466	25.5	1184 (16 x 74)
3-1/2	2.997	25.5	1425 (19 x 75)
4	3.330	25.0	1554 (21 x 74)
4-1/2	3.983	25.0	1875 (25 x 75)
5-1/2	4.421	25.0	2072 (28 x 74)
6-5/8	5.425	25.0	2550 (34 x 75)
7	6.205	25.0	2925 (39 x 75)
7-5/8	6.205	23.5	2730 (39 x 70)
9-5/8	7.840	23.5	3450 (50 x 69)
10-3/4	8.850	23.5	3920 (56 x 70)
11-3/4	10.715	23.5	4692 (68 x 69)
13-3/8	11.965	23.0	5175 (75 x 69)



Centralizers.
Molded epoxy casing and tubing centralizers are available for all sizes

Casing Centralizer



Centralizers can be installed at any given position on the casing body and with any given quantity per joint. The centralizers are durable and of close tolerance dimensions

Future Pipe Industries, Inc. Centralizers are composed of molded epoxy grout and are available at customer specified clearance diameters.

Special Features

In order to more closely fulfill the requirements of particular glass fiber applications, Future Pipe Industries, Inc. offers a variety of special product features to accommodate less common requirements and requests from our customers. The following list details some of the typical features.

- **Turned Down Connections.**
  Particularly in the case of down-hole products where tubing, liners, and casing must be inserted into open holes or existing casing, a maximum connection outside diameter less than that of the standard product is occasionally necessary. In these circumstances the bell-shaped female thread connection can, to a limited degree, be diminished by removing material on a lathe. This optional feature is more thoroughly detailed later in this section.

- **Strap-Lock Upset.**
  Strap wrenches and strap equipped hydraulic tongs are normally used to makeup glass fiber pipe and tubing. In order to do so the fabric belt must grip on the smooth glassy surface of the glass fiber and this frequently presents slippage problems. To resolve this common problem, Future Pipe Industries, Inc. offers, a patented process and product named Strap-Lock. This consists of a sparingly applied rough coat surface bonded to the upset area of the pipe. All strap type tools grip this surface firmly and positively and no performance properties of the product are diminished by this feature.

- **Rough Coat Exterior.**
  A rough coat exterior consisting of number 0 blasting abrasive bonded to the exterior of casing intended to be cemented into the well is available in all sizes. The abrasive is applied to the pipe surface prior to curing which results in the coating being essentially integral to the casing body. The rough coat consequently will not un-bond from the casing body and provides a strong permanent anchor pattern for the intended cement.

- **Flush Joints and Custom Connections.**
  In some sizes and circumstances Future Pipe Industries, Inc. offers special non-standard connections and thread forms per the customer's specification. These connections include flush joints for down-hole applications as well as varying thread forms.

Special Services

The following is a list of in-plant services available to customers of Future Pipe Industries, Inc. These services are typically charged either on a per item basis or as a package included in the price of products sold for which the services are provided. These services are available only for products manufactured by Future Pipe Industries, Inc.

- **Assembly of Products.**
  Manifolds, spools, cooling rings, and other assemblies of glass fiber products sold by Future Pipe Industries, Inc. can be assembled and made up in the plant to the extent practical prior to shipping to the job site. Specific and accurate dimensional control in accordance with customer provided drawings and specifications is maintained and pressure testing of the pre-assembled combinations of parts is performed.

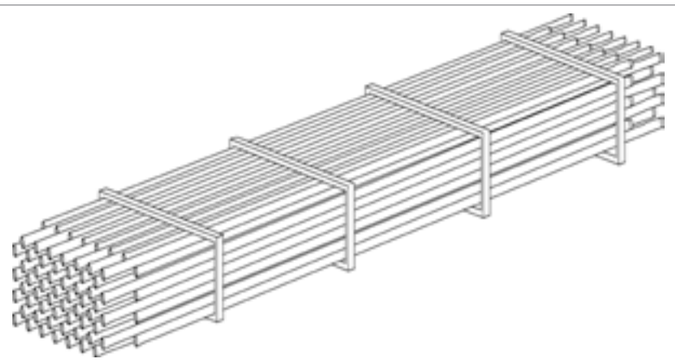
- **Special Makeup Services.**
  Services to make up parts or assemblies delivered to the plant that are intended to be used in conjunction with Future Pipe Industries, Inc. products is available. Down hole tools, metallic pup or sub joints, valves, and other items can be made up to the consecutive joint of glass fiber pipe or tubing in the installation design. This service is generally performed to save rig time and to insure that the more complicated and delicate makeup is performed in the best conditions possible. The Future Pipe Industries, Inc. facility is fully equipped with the necessary handling equipment for such equipment.

- **Inspection Services.**
  In-plant inspection of used products delivered to the Future Pipe Industries, Inc. facility is available. Inspection services include thread inspection, pipe dimensional inspections, and chemical degradation inspections. Disposal of rejected products is available as well.

- **Rethreading Used Tubing.**
  Threaded male ends on pipe or tubing can be cut off and rethreaded to reclaim used products.

- **Chemical Exposure Testing.**
  In-house temperature controlled long, or short-term chemical exposure testing is available to verify the suitability of glass fiber products in particularly severe chemical service. Glass fiber coupons are immersed in the customer provided fluid intended to be handled by glass fiber pipe or tubing and held in a temperature-controlled oven. After an appropriate period, the coupons are recovered and inspected to determine their resistance to the chemical in question.

Shipping Procedures



SIZE YB / RB	JOINTS / CRATE	FEET / CRATE
2" / 2-3/8" (500 - 1500) PSI	116	3,480
2" / 2-3/8" (1750 - 2500) PSI	109	3,270
2" / 2-3/8" (2750 - 3000) PSI	102	3,060
2-1/2" / 2-7/8" (500 - 1750) PSI	81	2,430
2-1/2" / 2-7/8" (2000 - 2500) PSI	75	2,250
2-1/2" / 2-7/8" (2750 - 3000) PSI	69	2,070
3" / 3-1/2" (500 - 2250) PSI	53	1,590
3" / 3-1/2" (2500 - 3000) PSI	48	1,440
3-1/2" / 4" (500 - 2750) PSI	34	1,020
3-1/2" / 4" (3000 - 3000) PSI	30	900
4" / 4-1/2" (500 - 1500) PSI	34	1,020
4" / 4-1/2" (1750 - 2500) PSI	30	900
4" / 4-1/2" (2750 - 3000) PSI	20	600
5" / 5-1/2" (500 - 3000) PSI	20	600
6" / 6-5/8" (500 - 2750) PSI	12	360
7" (1000 - 1500) PSI	12	360
7" (1750) PSI	10	300
6L / 7-5/8" (500 - 1500) PSI	12	360
6L / 7-5/8" (1750 - 2500) PSI	10	300

Packing of pipe, tubing, and casing for size up to 6 inch in pipe and 6-5/8" in casing shall be in an open-side steel band reinforced wooden crate frames as per the (Figure 1) above. Depending on the wall thickness of the of the pipe/casing shipped, the individual crate weight shall be from 3,500 to 5,000 lbs. the standard crate outside dimensions are 48 inches wide, 21 inches high (for sizes marked in Blue) or 18 inches high (for sizes marked in Orange) and 34 feet long. An estimate number of joints per crate are indicated in Table 1.

Typically eight crates can be loaded on a standard flatbed trailer. The crate loading and unloading can be done with either a crane or forklift. Nylon straps shall be used on crane lifts and padding shall be used on forklifts forks.

Yellow Box® Standard & Green Box®

Truckload Load Quantities

Joints/Feet per Truckload

Pipe Size	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000
2"	928	928	928	928	928	872	872	872	872	816	816
	27,840	27,840	27,840	27,840	27,840	26,160	26,160	26,160	26,160	24,480	24,480
2-1/2"	648	648	648	648	648	648	600	600	600	552	552
	19,440	19,440	19,440	19,440	19,440	19,440	18,000	18,000	18,000	16,560	16,560
3"	424	424	424	424	424	424	424	424	384	384	384
	12,720	12,720	12,720	12,720	12,720	12,720	12,720	12,720	11,520	11,520	11,520
3-1/2"	272	272	272	272	272	272	272	272	272	272	240
	8,160	8,160	8,160	8,160	8,160	8,160	8,160	8,160	8,160	8,160	7,200
4"	272	272	272	272	272	240	240	240	240	160	160
	8,160	8,160	8,160	8,160	8,160	7,200	7,200	7,200	7,200	4,800	4,800
5"	160	160	160	160	160	160	160	160	160	160	160
	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800
6"	120	120	120	120	120	120	120	120	120	120	
	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	
*6-L	120	120	120	120	120	100	100	100	100		
	3,600	3,600	3,600	3,600	3,600	3,000	3,000	3,000	3,000		
*8"	64	64	64	64	64	64	64	64	64		
	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920		
*10"	49	49	49	49	49	49	49	49	49		
	1,470	1,470	1,470	1,470	1,470	1,470	1,470	1,470	1,470		
*10-L	49	49	49	49	49	49					
	1,470	1,470	1,470	1,470	1,470	1,470					
*12"	36	36	36	36	36	36					
	1,080	1,080	1,080	1,080	1,080	1,080					
*14-1/2"	20	20	20	20	20	20					
	600	600	600	600	600	600					
*16-1/2"	20	16	16	16	16						
	600	480	480	480	480						
*18"	16	16	16	16	16						
	480	480	480	480	480						
*24"	9	9	9	9							
	270	270	270	270							

General Notes
1- The actual truckload quantities will vary by +/- 5 % based on the loading condition, and other affecting parameters.
2- All truckloads are based on the U.S. transportation laws.

Container Load Quantities

Joints/Feet per Truckload

Pipe Size	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000
2"	828	828	828	828	805	770	770	770	748	748	714
	24,840	24,840	24,840	24,840	24,150	23,100	23,100	23,100	22,440	22,440	21,420
2-1/2"	630	600	600	580	580	580	551	551	532	504	400
	18,900	18,000	18,000	17,400	17,400	17,400	16,530	16,530	15,960	15,120	12,000
3"	450	450	450	432	408	408	408	391	391	345	273
	13,500	13,500	13,500	12,960	12,240	12,240	12,240	11,730	11,730	10,350	8,190
3-1/2"	374	374	352	352	336	336	336	336	294	273	240
	11,220	11,220	10,560	10,560	10,080	10,080	10,080	10,080	8,820	8,190	7,200
4"	285	285	266	266	266	252	252	252	187	170	
	8,550	8,550	7,980	7,980	7,980	7,560	7,560	7,560	5,610	5,100	
5"	238	221	221	208	208	208	208	192	176		
	7,140	6,630	6,630	6,240	6,240	6,240	6,240	5,760	5,280		
6"	168	154	154	143	143	143	143	130	117		
	5,040	4,620	4,620	4,290	4,290	4,290	4,290	3,900	3,510		
*6-L	117	108	96	96	96	88	88	88			
	3,510	3,240	2,880	2,880	2,880	2,640	2,640	2,640			
*8"	63	63	63	63	63	63	63	56			
	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,680			
*10"	56	48	48	48	48	48	48				
	1,680	1,440	1,440	1,440	1,440	1,440	1,440				
*10-L	42	42	35	35	30	30					
	1,260	1,260	1,050	1,050	900	900					
*12"	30	30	30	30	30	30					
	900	900	900	900	900	900					
*14-1/2"	20	20	20	20	20						
	600	600	600	600	600						
*16-1/2"	16	16	16	16	16						
	480	480	480	480	480						
*18"	12	12	12	12							
	360	360	360	360							
*24"	9	9	9								
	270	270	270								

General Notes
1- The actual container quantities will vary by +/- 5 % based on the loading condition, packing method, and other affecting parameters such as fittings, accessories, etc.
2- All containers loading are based on 40 feet High Cube (HC) container.
3- All container load quantity is based on the use of Sled Skids to facilitate the loading and unloading process.

Yellow Box® API 15HR Design & Green Box®

Truckload Load Quantities

Joints/Feet per Truckload

Pipe Size	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000
2"	928	928	928	928	928	872	872	872	872	816	648
	27,840	27,840	27,840	27,840	27,840	26,160	26,160	26,160	26,160	24,480	19,440
2-1/2"	648	648	648	648	648	648	600	600	424	424	424
	19,440	19,440	19,440	19,440	19,440	19,440	18,000	18,000	12,720	12,720	12,720
3"	424	424	424	424	424	424	424	424	384	272	272
	12,720	12,720	12,720	12,720	12,720	12,720	12,720	12,720	11,520	8,160	8,160
3-1/2"	272	272	272	272	272	272	272	272	272	272	272
	8,160	8,160	8,160	8,160	8,160	8,160	8,160	8,160	8,160	8,160	8,160
4"	272	272	272	272	272	240	160	160	160	160	
	8,160	8,160	8,160	8,160	8,160	7,200	4,800	4,800	4,800	4,800	
5"	160	160	160	160	160	160	160	160	160		
	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800		
6"	120	120	120	120	120	120	120	120	120		
	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600		
*6-L	120	120	120	120	120	100	100	100			
	3,600	3,600	3,600	3,600	3,600	3,000	3,000	3,000			
*8"	64	64	64	64	64	64	64	64			
	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920			
*10"	49	49	49	49	49	49	49				
	1,470	1,470	1,470	1,470	1,470	1,470	1,470				
*10-L	49	49	49	49	49	49					
	1,470	1,470	1,470	1,470	1,470	1,470					
*12"	36	36	36	36	36	36					
	1,080	1,080	1,080	1,080	1,080	1,080					
*14-1/2"	20	20	20	20	20						
	600	600	600	600	600						
*16-1/2"	20	16	16	16	16						
	600	480	480	480	480						
*18"	16	16	16	16							
	480	480	480	480							
*24"	9	9	9								
	270	270	270								

General Notes

1- The actual truckload quantities will vary by +/- 5 % based on the loading condition, and other affecting parameters.
2- All truckloads are based on the U.S. transportation laws.

Container Load Quantities

Joints/Feet per Truckload

Pipe Size	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000
2"	828	828	828	805	770	770	770	748	714	660	510
	24,840	24,840	24,840	24,150	23,100	23,100	23,100	22,440	21,420	19,800	15,300
2-1/2"	630	600	600	580	580	551	532	532	400	375	325
	18,900	18,000	18,000	17,400	17,400	16,530	15,960	15,960	12,000	11,250	9,750
3"	450	450	432	408	408	408	391	368	322	252	231
	13,500	13,500	12,960	12,240	12,240	12,240	11,730	11,040	9,660	7,560	6,930
3-1/2"	374	374	352	336	336	336	315	273	260	220	190
	11,220	11,220	10,560	10,080	10,080	10,080	9,450	8,190	7,800	6,600	5,700
4"	285	285	266	266	252	252	204	187	160	144	
	8,550	8,550	7,980	7,980	7,560	7,560	6,120	5,610	4,800	4,320	
5"	238	221	221	208	208	208	176	160	144		
	7,140	6,630	6,630	6,240	6,240	6,240	5,280	4,800	4,320		
6"	168	126	117	117	117	117	117	104	84		
	5,040	3.780	3,510	3,510	3,510	3,510	3,510	3,120	2,520		
*6-L	117	96	96	96	88	88	88	77			
	3,510	2,880	2,880	2,880	2,640	2,640	2,640	2,310			
*8"	63	63	63	63	63	63	56	48			
	1,890	1,890	1,890	1,890	1,890	1,890	1,680	1,440			
*10"	56	48	48	48	48	42	42				
	1,680	1,440	1,440	1,440	1,440	1,260	1,260				
*10-L	42	35	35	30	30	30					
	1,260	1,050	1,050	900	900	900					
*12"	30	30	30	30	30	24					
	900	900	900	900	900	720					
*14-1/2"	20	20	20	20	20						
	600	600	600	600	600						
*16-1/2"	16	16	16	16	12						
	480	480	480	480	360						
*18"	12	12	12	12							
	360	360	360	360							
*24"	9	9	6								
	270	270	180								

General Notes

1- The actual container quantities will vary by +/- 5 % based on the loading condition, packing method, and other affecting parameters such as fittings, accessories, etc.
2- All containers loading are based on 40 feet High Cube (HC) container.
3- All container load quantity is based on the use of Sled Skids to facilitate the loading and unloading process

Geostrong™ Red Box® & Blue Box®

Truckload Load Quantities

Joints/Feet per Truckload

Pipe Size	1000	1250	1500	1750	2000	2250	2500	2750	3000
2-3/8"	928	928	928	872	872	872	872	816	816
	27,840	27,840	27,840	26,160	26,160	26,160	26,160	24,480	24,480
2-7/8"	648	648	648	648	600	600	600	552	552
	19,440	19,440	19,440	19,440	18,000	18,000	18,000	16,560	16,560
3-1/2"	424	424	424	424	424	424	384	384	384
	12,720	12,720	12,720	12,720	12,720	12,720	11,520	11,520	11,520
4"	272	272	272	272	272	272	272	272	240
	8,160	8,160	8,160	8,160	8,160	8,160	8,160	8,160	7,200
4-1/2"	272	272	272	240	240	240	240	160	160
	8,160	8,160	8,160	7,200	7,200	7,200	7,200	4,800	4,800
5-1/2"	160	160	160	160	160	160	160	160	160
	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800
6-5/8"	120	120	120	120	120	120	120	120	
	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	
*7"	120	120	120	100					
	3,600	3,600	3,600	3,000					
*7-5/8"	100	100	100	100	100	100	100	100	
	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	
*9-5/8"	64	64	64	64	64	64	64	64	
	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	
*10-3/4"	49	49	49	49	49	49	49		
	1,470	1,470	1,470	1,470	1,470	1,470	1,470		
*11-3/4"	49	49	49	49					
	1,470	1,470	1,470	1,470					
*13-3/8"	36	36	36	36					
	1,080	1,080	1,080	1,080					
*16"	20	20	20	20					
	600	600	600	600					
*18"	16	16	16						
	480	480	480						
*20"	16	16	16						
	480	480	480						
*24"	9	9							
	270	270							

General Notes
1- The actual truckload quantities will vary by +/- 5 % based on the loading condition, and other affecting parameters.
2- All truckloads are based on the U.S. transportation laws.

Container Load Quantities

Joints/Feet per Truckload

Pipe Size	1000	1250	1500	1750	2000	2250	2500	2750	3000
2-3/8"	828	805	770	770	770	748	714	714	627
	24,840	24,150	23,100	23,100	23,100	22,440	21,420	21,420	18,810
2-7/8"	600	580	580	551	551	532	532	476	420
	18,000	17,400	17,400	16,530	16,530	15,960	15,960	14,280	12,600
3-1/2"	432	408	408	408	408	391	345	299	276
	12,960	12,240	12,240	12,240	12,240	11,730	10,350	8,970	8,280
4"	352	336	336	336	336	315	273	240	220
	10,560	10,080	10,080	10,080	10,080	9,450	8,190	7,200	6,600
4-1/2"	266	266	252	252	252	216	198	160	144
	7,980	7,980	7,560	7,560	7,560	6,480	5,940	4,800	4,320
5-1/2"	221	208	208	208	192	176	160	135	120
	6,630	6,240	6,240	6,240	5,760	5,280	4,800	4,050	3,600
6-5/8"	143	143	143	143	130	117	104	91	
	4,290	4,290	4,290	4,290	3,900	3,510	3,120	2,730	
*7"	96	96	96	96					
	2,880	2,880	2,880	2,880					
*7-5/8"	96	96	96	88	88	88	66	66	
	2,880	2,880	2,880	2,640	2,640	2,640	1,980	1,980	
*9-5/8"	63	63	63	63	56	56	48		
	1,890	1,890	1,890	1,890	1,680	1,680	1,440		
*10-3/4"	48	48	48	48	42	35	35		
	1,440	1,440	1,440	1,440	1,260	1,050	1,050		
*11-3/4"	35	35	35	30					
	1,050	1,050	1,050	900					
*13-3/8"	30	30	30	30					
	900	900	900	900					
*16"	20	20	20	20					
	600	600	600	600					
*18"	16	16	16						
	480	480	480						
*20"	12	12	12						
	360	360	360						
*24"	9	6	6						
	270	180	180						

General Notes
1- The actual container quantities will vary by +/- 5 % based on the loading condition, packing method, and other affecting parameters such as fittings, accessories, etc.
2- All containers loading are based on 40 feet High Cube (HC) container.
3- All container load quantity is based on the use of Sled Skids to facilitate the loading and unloading process.

Future Pipe Industries, Inc. Warranty and Disclaimer of Warranties

The pipe, tubing, casing, fittings and other products and product components manufactured and sold by FUTURE PIPE INDUSTRIES, INC. ("Manufacturer") have the following warranty and disclaimer of warranties:

Subject to the conditions set forth herein, Manufacturer warrants that all products manufactured and sold by Manufacturer to its customer ("Purchaser") shall be free from defects in material and workmanship under normal use and service by Purchaser ("Covered Defect") for a period of one (1) year from date of purchase by Purchaser. Should a Covered Defect arise within said time period, provided Purchaser notifies Manufacturer of such Covered Defect within twenty one (21) days from the date of Purchaser's discovery, Manufacturer shall, upon its determination that an actual defect exists and that such defect constitutes a Covered Defect, at Manufacturer's sole option, either (i) replace such defective product or component of such product with a replacement product or component, (ii) repair such defective product or component or (iii) refund the sales price to Purchaser. All costs of transportation of replaced, damaged and/or repaired product or components, including freight, insurance and carrying costs shall be prepaid by Purchaser.

A Covered Defect shall not include, and this warranty shall not apply, to any products or components of products of Manufacturer which: (i) have been subjected to any accident, faulty installation, misapplication, abuse, neglect, misuse or prolonged exposure to ultraviolet rays; (ii) have been repaired or altered by any party other than Manufacturer without the express prior written consent of Manufacturer; (iii) have been used after discovery of a defect without the express prior written consent of Manufacturer; (iv) any user refuses to permit Manufacturer to examine; (v) have been used with any thread compound other than TFC#15 or Manufacturer's approved equivalent for makeup of pipe joints; or (vi) are installed without the supervision or instruction of Manufacturer's authorized representative. With respect to any products or components of products of Manufacturer which have been used in chemical/waste disposal services or systems, the warranty hereunder extends only through the installation period, including acceptance testing of the product, or for a period of one (1) year from the date of purchase, whichever occurs first.

The foregoing warranty contained herein is exclusive and in lieu of all other warranties, whether express, implied or statutory, including, but not by way of limitation, any warranty of merchantability or fitness for any particular purpose. No other warranty is made with respect to Manufacturer's products and components of products except as expressly provided hereunder, nor is there any warranty made whatsoever concerning the installation or use of Manufacturer's products or components of products.

Manufacturer's warranty herein extends solely to the original Purchaser of Manufacturer's product and is not transferable, and does not extend, to any subsequent owner or user of Manufacturer's product.

The remedies provided in this warranty constitute the sole recourse of Purchaser against Manufacturer for breach of any of Manufacturer's obligations under the sales contract with Purchaser regarding the sale of Manufacturer's product to Purchaser, whether the claim is made in tort or in contract. Manufacturer shall not be liable to Purchaser or any party for any special, incidental or consequential damages resulting from the use or performance of Manufacturer's product sold to Purchaser. Furthermore, in no event, shall Manufacturer's liability to Purchaser or any party relating to the use or performance of Manufacturer's product sold to Purchaser exceed the purchase price of Manufacturer's product to Purchaser.

Manufacturer reserves the right to make revisions from time to time of its product without extending or renewing its warranty with regard to previously manufactured products and components and without obligation to retrofit, replace or reinstall previously manufactured products to incorporate revisions therein.

All disputes regarding this warranty and the contents hereof shall be resolved through binding arbitration administered by the American Arbitration Association ("AAA") pursuant to the Federal Arbitration Act in accordance with the Commercial Arbitration Rules of the AAA to be conducted in an arbitration proceeding to be held in Houston, Harris County, Texas.

MANUFACTURER SPECIFICALLY DISAVOWS ANY OTHER REPRESENTATION, WARRANTY OR LIABILITY NOT CONTAINED HEREIN RELATING TO THE CONDITION, USE OR INSTALLATION OF MANUFACTURER'S PRODUCT SOLD TO PURCHASER.

Appendix

Appendix A
Line Pipe Technical Data Sheets 58

Appendix B
Flowstrong® Yellow Box® API 15HR Design 76

Appendix C
Geostrong™ Red Box® Technical Data Sheets 94

Appendix D
Line Pipe Fittings 112

Appendix E
Line pipe, Tubing & Casing Fittings 115

Appendix A - Line Pipe Technical Data Sheets

Note: Please consult Future Pipe Industries for larger diameters not listed in the following pressure classes

Flowstrong® Yellow Box® 1000 STD

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.14	0.07	2.69	3.57	0.58	17	0238-EUE-LONG-A8
2-1/2	2.47	2.37	2.64	0.09	3.19	4.13	0.83	25	0278-EUE-LONG-A8
3	3.00	2.90	3.20	0.10	3.85	4.95	1.22	37	0312-EUE-LONG-A8
3-1/2	3.33	3.24	3.56	0.11	4.35	5.64	1.58	47	0400-EUE-LONG-B8
4	3.98	3.89	4.26	0.14	4.85	6.03	2.00	60	0412-EUE-LONG-A8
5	4.42	4.33	4.73	0.15	5.60	7.12	2.70	81	0512-CSG-LTC-B8
6	5.43	5.33	5.80	0.19	6.73	8.44	4.00	120	0658-CSG-LTC-C8
6L	6.21	6.11	6.63	0.21	7.10	8.48	4.43	133	0700-CSG-LTC-C8
8	7.84	7.75	8.38	0.27	8.73	10.22	6.95	209	0858-CSG-LTC-B8
10	8.85	8.76	9.46	0.31	10.85	13.56	11.28	339	1034-CSG-STC-B8
10L	10.72	10.63	11.46	0.37	12.14	13.99	14.18	425	1134-CSG-STC-Z6
12	11.97	11.87	12.79	0.41	13.64	15.68	18.13	544	1338-CSG-STC-B4
14-1/2	14.48	14.39	15.48	0.50	16.32	18.78	26.62	798	1600-CSG-STC-B4
16-1/2	16.55	16.46	17.70	0.57	18.89	22.07	36.52	1096	1800-CSG-STC-B4
18	17.98	17.89	19.22	0.62	20.26	23.58	42.23	1267	2000-CSG-STC-Z6
20	19.69	19.60	21.05	0.68	22.53	26.62	50.19	1882	2200-CSG-STC-Z4
24	23.57	23.48	25.20	0.81	26.81	31.74	75.03	2814	2600-CSG-STC-C4

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

*Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	1,000	1,300	240	4,500	107	AFA
2-1/2	1,000	1,300	240	7,000	132	BCA
3	1,000	1,300	240	10,500	161	BIA
3-1/2	1,000	1,300	240	13,000	179	CFA
4	1,000	1,300	240	18,500	214	CIA
5	1,000	1,300	240	23,000	237	DFA
6	1,000	1,300	240	34,500	291	EIA
6L	1,000	1,300	240	45,500	333	ERA
8	1,000	1,300	240	72,500	420	GCA
10	1,000	1,300	240	92,500	475	IFA
10L	1,000	1,300	240	135,500	575	JLC
12	1,000	1,300	240	169,000	642	LIC
14-1/2	1,000	1,300	240	247,500	776	NBC
16-1/2	1,000	1,300	240	323,500	888	OFC
18	1,000	1,300	240	375,000	964	PRC
20	1,000	1,300	240	457,500	1056	QCC
24	1,000	1,300	240	655,500	1264	SCC

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Flowstrong® Yellow Box® 1250 STD

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.14	0.07	2.69	3.57	0.58	20	0238-EUE-LONG-A8
2-1/2	2.47	2.37	2.64	0.09	3.19	4.13	0.83	29	0278-EUE-LONG-A8
3	3.00	2.90	3.20	0.10	3.85	4.95	1.22	43	0312-EUE-LONG-A8
3-1/2	3.33	3.24	3.56	0.11	4.35	5.64	1.58	55	0400-EUE-LONG-B8
4	3.98	3.89	4.26	0.14	4.85	6.03	2.00	73	0412-EUE-LONG-A8
5	4.42	4.33	4.73	0.15	5.60	7.12	2.70	95	0512-CSG-LTC-B8
6	5.43	5.33	5.80	0.19	6.73	8.44	4.00	141	0658-CSG-LTC-C8
6L	6.21	6.11	6.63	0.21	7.10	8.48	4.43	163	0700-CSG-LTC-C8
8	7.84	7.75	8.38	0.27	8.73	10.22	6.95	307	0858-CSG-LTC-B8
10	8.85	8.76	9.46	0.31	10.85	13.56	11.28	396	1034-CSG-STC-B8
10L	10.72	10.63	11.46	0.37	12.14	13.99	14.18	514	1134-CSG-STC-Z6
12	11.97	11.87	12.79	0.41	13.64	15.68	18.13	654	1338-CSG-STC-B4
14-1/2	14.48	14.39	15.48	0.50	16.32	18.78	26.62	958	1600-CSG-STC-B4
16-1/2	16.55	16.46	17.70	0.57	18.89	22.07	36.52	1305	1800-CSG-STC-B4
18	17.98	17.89	19.22	0.62	20.26	23.58	42.23	1514	2000-CSG-STC-Z6
20	19.69	19.60	21.05	0.68	22.53	26.62	50.19	2260	2200-CSG-STC-Z4
24	23.57	24.48	25.20	0.81	26.81	31.74	75.03	3354	2600-CSG-STC-C4

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

*Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	1,250	1,625	450	6,000	109	AFA
2-1/2	1,250	1,625	450	9,000	135	BCA
3	1,250	1,625	450	13,500	164	BIA
3-1/2	1,250	1,625	450	16,500	182	CFA
4	1,250	1,625	450	24,000	217	CIA
5	1,250	1,625	450	29,500	241	DFA
6	1,250	1,625	450	44,000	296	EIA
6L	1,250	1,625	450	58,000	339	ERA
8	1,250	1,625	450	92,500	428	GCA
10	1,250	1,625	450	117,500	483	IFA
10L	1,250	1,625	450	172,500	585	JLC
12	1,250	1,625	450	215,000	653	LIC
14-1/2	1,250	1,625	450	315,000	790	NBC
16-1/2	1,250	1,625	450	411,500	903	OFC
18	1,250	1,625	450	375,000	981	PRC
20	1,250	1,625	450	582,500	1075	QCC
24	1,250	1,625	450	835,500	1286	SCC

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Flowstrong® Yellow Box® 1500 STD

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.21	0.11	2.69	3.61	0.78	23	0238-EUE-LONG-A8
2-1/2	2.47	2.37	2.73	0.13	3.19	4.19	1.13	34	0278-EUE-LONG-A8
3	3.00	2.90	3.31	0.16	3.85	5.02	1.68	50	0312-EUE-LONG-A8
3-1/2	3.33	3.24	3.68	0.18	4.35	5.72	2.14	64	0400-EUE-LONG-B8
4	3.98	3.89	4.40	0.21	4.85	6.14	2.82	85	0412-EUE-LONG-A8
5	4.42	4.33	4.89	0.23	5.60	7.25	3.65	109	0512-CSG-LTC-B8
6	5.43	5.33	6.00	0.29	6.73	8.61	5.49	165	0658-CSG-LTC-C8
6L	6.21	6.11	6.86	0.33	7.10	8.68	6.42	193	0700-CSG-LTC-C8
8	7.84	7.75	8.67	0.41	9.73	12.49	11.80	354	0858-CSG-LTC-B8
10	8.85	8.76	9.78	0.47	10.85	13.88	15.18	455	1034-CSG-STC-B8
10L	10.72	10.63	11.85	0.57	13.02	15.97	23.27	698	1134-CSG-STC-Z6
12	11.97	11.87	13.23	0.63	14.36	17.61	29.14	874	1338-CSG-STC-B4
*14-1/2	14.48	14.39	16.01	0.76	17.08	20.92	41.24	1237	1600-CSG-STC-B4
16-1/2	16.55	16.46	18.30	0.87	19.27	23.57	53.63	1609	1800-CSG-STC-B4
*18	17.98	17.89	19.88	0.95	21.12	26.13	65.79	1974	2000-CSG-STC-Z6
20	19.69	19.60	21.77	1.04	22.53	27.58	70.70	2651	2200-CSG-STC-Z4

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

*Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	1,500	1,950	750	7,500	111	AFA
2-1/2	1,500	1,950	750	11,000	137	BCA
3	1,500	1,950	750	16,500	166	BIA
3-1/2	1,500	1,950	750	20,500	185	CFA
4	1,500	1,950	750	29,000	221	CIA
5	1,500	1,950	750	36,000	246	DFA
6	1,500	1,950	750	54,000	301	EIA
6L	1,500	1,950	750	70,500	345	ERA
8	1,500	1,950	750	113,000	435	GCA
10	1,500	1,950	750	144,000	492	IFA
10L	1,500	1,950	750	177,000	595	JLC
12	1,500	1,950	750	263,000	665	LIC
*14-1/2	1,500	1,950	750	385,000	804	NBC
16-1/2	1,500	1,950	750	503,500	919	OFC
*18	1,500	1,950	750	375,000	999	PRC
20	1,500	1,950	750	652,500	1094	QCC

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/i^{n3}	0.07	ASTM D792
Thermal Conductivity	Btu/hr/ft^2/in/degF	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Flowstrong® Yellow Box® 1750 STD

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.25	0.12	2.69	3.63	0.88	26	0238-EUE-LONG-A8
2-1/2	2.47	2.37	2.77	0.15	3.19	4.21	1.31	39	0278-EUE-LONG-A8
3	3.00	2.90	3.37	0.19	3.85	5.05	1.92	58	0312-EUE-LONG-A8
3-1/2	3.33	3.24	3.74	0.21	4.35	5.77	2.43	73	0400-EUE-LONG-B8
4	3.98	3.89	4.48	0.25	4.85	6.19	3.24	97	0412-EUE-LONG-A8
5	4.42	4.33	4.97	0.27	5.60	7.32	4.21	126	0512-CSG-LTC-B8
6	5.43	5.33	6.10	0.34	6.73	8.70	6.26	188	0658-CSG-LTC-C8
6L	6.21	6.11	6.98	0.39	7.73	10.03	8.21	246	0700-CSG-LTC-C8
8	7.84	7.75	8.81	0.49	9.73	12.63	13.41	402	0858-CSG-LTC-B8
10	8.85	8.76	9.95	0.55	10.91	14.14	17.59	528	1034-CSG-STC-B8
*10L	10.72	10.63	12.05	0.67	13.02	16.19	26.41	792	1134-CSG-STC-Z6
*12	11.97	11.87	13.45	0.74	14.36	17.86	33.06	992	1338-CSG-STC-B4
14-1/2	14.48	14.39	16.28	0.90	17.08	21.24	46.99	1410	1600-CSG-STC-B4

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

*Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	1,750	2,275	1,200	8,500	113	AFA
2-1/2	1,750	2,275	1,200	13,500	139	BCA
3	1,750	2,275	1,200	19,500	169	BIA
3-1/2	1,750	2,275	1,200	24,000	188	CFA
4	1,750	2,275	1,200	34,500	225	CIA
5	1,750	2,275	1,200	42,500	250	DFA
6	1,750	2,275	1,200	64,500	307	EIA
6L	1,750	2,275	1,200	83,500	351	ERA
8	1,750	2,275	1,200	134,500	443	GCA
10	1,750	2,275	1,200	157,500	500	IFA
*10L	1,750	2,275	1,200	238,000	606	JLC
*12	1,750	2,275	1,200	313,000	676	LIC
14-1/2	1,750	2,275	1,200	449,000	819	NBC

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Flowstrong® Yellow Box® 2000 STD

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.29	0.14	2.69	3.65	0.99	30	0238-EUE-LONG-A8
2-1/2	2.47	2.37	2.82	0.18	3.19	4.24	1.48	44	0278-EUE-LONG-A8
3	3.00	2.90	3.43	0.22	3.85	5.09	2.17	65	0312-EUE-LONG-A8
3-1/2	3.33	3.24	3.81	0.24	4.35	5.81	2.73	82	0400-EUE-LONG-B8
4	3.98	3.89	4.55	0.29	4.85	6.25	3.72	112	0412-EUE-LONG-A8
5	4.42	4.33	5.06	0.32	5.60	7.38	4.75	142	0512-CSG-LTC-B8
6	5.43	5.33	6.20	0.39	6.73	8.78	7.11	213	0658-CSG-LTC-C8
6L	6.21	6.11	7.10	0.45	7.73	10.14	9.28	278	0700-CSG-LTC-C8
8	7.84	7.75	8.97	0.56	9.73	12.77	15.07	452	0858-CSG-LTC-B8
10	8.85	8.76	10.12	0.64	10.91	14.31	19.69	591	1034-CSG-STC-B8
10L	10.72	10.63	12.26	0.77	13.02	16.41	29.68	890	1134-CSG-STC-Z6
12	11.97	11.88	13.68	0.86	14.55	18.48	38.73	1162	1338-CSG-STC-B4

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

*Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	2,000	2,600	1,700	10,000	115	AFA
2-1/2	2,000	2,600	1,700	15,500	142	BCA
3	2,000	2,600	1,700	23,000	172	BIA
3-1/2	2,000	2,600	1,700	28,000	192	CFA
4	2,000	2,600	1,700	40,500	229	CIA
5	2,000	2,600	1,700	50,000	254	DFA
6	2,000	2,600	1,700	75,000	312	EIA
6L	2,000	2,600	1,700	83,500	357	ERA
8	2,000	2,600	1,700	136,500	451	GCA
10	2,000	2,600	1,700	157,500	509	IFA
10L	2,000	2,600	1,700	292,500	617	JLC
12	2,000	2,600	1,700	364,500	688	LIC

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Flowstrong® Yellow Box® 2250 STD

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.33	0.16	2.69	3.67	1.12	34	0238-EUE-LONG-A8
2-1/2	2.47	2.37	2.87	0.20	3.19	4.27	1.65	49	0278-EUE-LONG-A8
3	3.00	2.90	3.49	0.24	3.85	5.13	2.42	73	0312-EUE-LONG-A8
3-1/2	3.33	3.24	3.87	0.27	4.35	5.85	3.08	93	0400-EUE-LONG-B8
4	3.98	3.89	4.63	0.32	4.85	6.31	4.18	125	0412-EUE-LONG-A8
5	4.42	4.33	5.14	0.36	5.60	7.45	5.34	160	0512-CSG-LTC-B8
6	5.43	5.33	6.31	0.44	6.73	8.87	7.96	239	0658-CSG-LTC-C8
6L	6.21	6.11	7.22	0.51	7.73	10.25	10.43	313	0700-CSG-LTC-C8
8	7.84	7.75	9.12	0.64	9.73	12.51	17.22	517	0858-CSG-LTC-B8
10	8.85	8.76	10.29	0.72	10.91	14.09	22.33	670	1034-CSG-STC-B8
10L	10.72	10.63	12.47	0.87	13.02	16.63	33.07	992	1134-CSG-STC-Z6

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

*Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	2,250	2,925	2,400	11,500	117	AFA
2-1/2	2,250	2,925	2,400	18,000	144	BCA
3	2,250	2,925	2,400	26,000	176	BIA
3-1/2	2,250	2,925	2,400	32,500	195	CFA
4	2,250	2,925	2,400	44,500	233	CIA
5	2,250	2,925	2,400	53,500	259	DFA
6	2,250	2,925	2,400	80,500	318	EIA
6L	2,250	2,925	2,400	112,500	363	ERA
8	2,250	2,925	2,400	179,500	459	GCA
10	2,250	2,925	2,400	229,000	518	IFA
10L	2,250	2,925	2,400	294,500	628	JLC

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Flowstrong® Yellow Box® 2500 STD

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.37	0.18	2.69	3.69	1.24	37	0238-EUE-LONG-A8
2-1/2	2.47	2.37	2.92	0.23	3.19	4.30	1.83	55	0278-EUE-LONG-A8
3	3.00	2.90	3.55	0.27	3.85	5.16	2.72	82	0312-EUE-LONG-A8
3-1/2	3.33	3.24	3.94	0.31	4.35	5.90	3.42	102	0400-EUE-LONG-B8
4	3.98	3.89	4.71	0.36	4.85	6.37	4.68	140	0412-EUE-LONG-A8
5	4.42	4.33	5.23	0.40	5.60	7.52	5.93	178	0512-CSG-LTC-B8
6	5.43	5.33	6.42	0.50	7.10	9.31	10.08	303	0658-CSG-LTC-C8
6L	6.21	6.12	7.34	0.57	7.73	9.96	12.13	364	0700-CSG-LTC-C8
8	7.84	7.75	9.28	0.72	9.92	13.03	20.07	602	0858-CSG-LTC-B8
10	8.85	8.76	10.47	0.81	11.11	14.67	25.62	769	1034-CSG-STC-B8

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

*Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	2,500	3,250	2,700	13,500	119	AFA
2-1/2	2,500	3,250	2,700	20,000	147	BCA
3	2,500	3,250	2,700	30,000	179	BIA
3-1/2	2,500	3,250	2,700	36,500	199	CFA
4	2,500	3,250	2,700	52,500	237	CIA
5	2,500	3,250	2,700	53,500	264	DFA
6	2,500	3,250	2,700	85,000	323	EIA
8	2,500	3,250	2,700	203,500	467	ERA
10	2,500	3,250	2,700	259,500	528	GCA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Flowstrong® Yellow Box® 2750 STD

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.41	0.20	2.69	3.32	1.36	41	0238-EUE-LONG-A8
2-1/2	2.47	2.37	2.97	0.25	3.19	3.93	2.05	62	0278-EUE-LONG-A8
3	3.00	2.90	3.61	0.31	4.35	5.80	3.42	103	0312-EUE-LONG-A8
3-1/2	3.33	3.24	4.01	0.34	4.85	6.55	4.24	127	0400-EUE-LONG-B8
4	3.98	3.89	4.79	0.41	5.60	7.52	5.94	178	0412-EUE-LONG-A8
5	4.42	4.33	5.32	0.45	6.73	9.44	8.21	246	0512-CSG-LTC-B8
6	5.43	5.33	6.53	0.55	7.10	9.41	11.00	330	0658-CSG-LTC-C8
6L	6.21	6.12	7.47	0.63	7.73	10.07	13.33	400	0700-CSG-LTC-C8
8	7.84	7.75	9.44	0.80	10.91	15.17	24.75	743	0858-CSG-LTC-B8

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

*Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	2,750	3,575	2,900	15,000	121	AFA
2-1/2	2,750	3,575	2,900	22,500	150	BCA
3	2,750	3,575	2,900	30,500	182	BIA
3-1/2	2,750	3,575	2,900	40,000	202	CFA
4	2,750	3,575	2,900	53,500	242	CIA
5	2,750	3,575	2,900	84,000	351	DFA
6	2,750	3,575	2,900	85,000	329	EIA
6L	2,750	3,575	2,900	143,000	377	ERA
8	2,750	3,575	2,900	228,500	476	GCA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Flowstrong® Yellow Box® 3000 STD

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.45	0.22	2.69	3.34	1.49	45	0238-EUE-LONG-A8
2-1/2	2.47	2.37	3.02	0.28	3.85	5.27	2.66	80	0278-EUE-LONG-A8
3	3.00	2.90	3.67	0.34	4.35	5.84	3.72	111	0312-EUE-LONG-A8
3-1/2	3.33	3.24	4.08	0.37	4.85	6.59	4.62	139	0400-EUE-LONG-B8
4	3.98	3.89	4.88	0.45	5.60	7.58	6.46	194	0412-EUE-LONG-A8
5	4.42	4.33	5.41	0.50	6.73	9.51	8.87	266	0512-CSG-LTC-B8
6	5.43	5.34	6.64	0.61	7.10	9.50	11.95	358	0658-CSG-LTC-C8
6L	6.21	6.12	7.60	0.70	8.79	12.29	16.74	502	0700-CSG-LTC-C8
8	7.84	7.75	9.60	0.88	10.91	15.33	26.71	801	0858-CSG-LTC-B8

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

*Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	3,000	3,900	3,200	16,500	124	AFA
2-1/2	3,000	3,900	3,200	25,000	152	BCA
3	3,000	3,900	3,200	37,000	185	BIA
3-1/2	3,000	3,900	3,200	44,500	206	CFA
4	3,000	3,900	3,200	53,500	246	CIA
5	3,000	3,900	3,200	81,000	273	DFA
6	3,000	3,900	3,200	122,000	335	EIA
6L	3,000	3,900	3,200	159,500	383	ERA
8	3,000	3,900	3,200	254,500	485	GCA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Appendix B - Flowstrong® Yellow Box® API 15HR Design

Note: Please consult Future Pipe Industries for larger diameters not listed in the following pressure classes

Flowstrong® Yellow Box® 1000 API 15HR

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.17	0.08	2.69	3.66	0.66	20	0238-EUE-LONG-A8
2-1/2	2.47	2.37	2.67	0.10	3.19	4.23	0.95	29	0278-EUE-LONG-A8
3	3.00	2.90	3.25	0.13	3.85	5.05	1.40	42	0312-EUE-LONG-A8
3-1/2	3.33	3.24	3.61	0.14	4.35	5.75	1.79	54	0400-EUE-LONG-B8
4	3.98	3.89	4.32	0.17	4.85	6.16	2.35	70	0412-EUE-LONG-A8
5	4.42	4.33	4.79	0.18	5.60	7.26	3.08	92	0512-CSG-LTC-B8
6	5.43	5.33	5.88	0.23	6.73	8.61	4.57	137	0658-CSG-LTC-C8
6L	6.21	6.11	6.72	0.26	7.10	8.67	5.26	158	0700-CSG-LTC-C8
8	7.84	7.75	8.50	0.33	8.73	10.45	8.19	246	0858-CSG-LTC-B8
10	8.85	8.76	9.59	0.37	10.85	13.82	12.90	387	1034-CSG-STC-B8

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint,f. TC = Threaded & Coupled) .
4. Not all sizes are available as monogrammed.

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	1,000	1,500	400	6,000	109	AFA
2-1/2	1,000	1,500	400	9,000	134	BCA
3	1,000	1,500	400	13,000	163	BIA
3-1/2	1,000	1,500	400	16,000	181	CFA
4	1,000	1,500	400	23,000	217	CIA
5	1,000	1,500	400	28,000	240	DFA
6	1,000	1,500	400	42,500	295	EIA
6L	1,000	1,500	400	55,500	338	ERA
8	1,000	1,500	400	88,500	426	GCA
10	1,000	1,500	400	113,000	481	IFA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Flowstrong® Yellow Box® 1250 API 15HR

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.21	0.11	2.69	3.69	0.78	23	0238-EUE-LONG-A8
2-1/2	2.47	2.37	2.73	0.13	3.19	4.26	1.14	34	0278-EUE-LONG-A8
3	3.00	2.90	3.31	0.16	3.85	5.10	1.69	51	0312-EUE-LONG-A8
3-1/2	3.33	3.24	3.68	0.18	4.35	5.81	2.15	64	0400-EUE-LONG-B8
4	3.98	3.89	4.40	0.21	4.85	6.23	2.83	85	0412-EUE-LONG-A8
5	4.42	4.33	4.89	0.23	5.60	7.35	3.66	110	0512-CSG-LTC-B8
6	5.43	5.33	6.00	0.29	6.73	8.72	5.51	165	0658-CSG-LTC-C8
6L	6.21	6.11	6.86	0.33	7.10	8.80	6.45	193	0700-CSG-LTC-C8
8	7.84	7.75	8.67	0.41	9.73	12.63	11.85	356	0858-CSG-LTC-B8
10	8.85	8.76	9.79	0.47	10.85	14.03	15.26	458	1034-CSG-STC-B8

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint,f. TC = Threaded & Coupled) .
4. Not all sizes are available as monogrammed.

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	1,250	1,875	750	7,500	111	AFA
2-1/2	1,250	1,875	750	11,000	137	BCA
3	1,250	1,875	750	16,500	166	BIA
3-1/2	1,250	1,875	750	20,500	185	CFA
4	1,250	1,875	750	29,000	221	CIA
5	1,250	1,875	750	36,000	246	DFA
6	1,250	1,875	750	54,000	301	EIA
6L	1,250	1,875	750	71,000	345	ERA
8	1,250	1,875	750	113,000	436	GCA
10	1,250	1,875	750	144,000	492	IFA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Flowstrong® Yellow Box® 1500 API 15HR

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.26	0.13	2.69	3.71	0.91	27	0238-EUE-LONG-A8
2-1/2	2.47	2.37	2.78	0.16	3.19	4.30	1.35	40	0278-EUE-LONG-A8
3	3.00	2.90	3.38	0.19	3.85	5.15	1.98	59	0312-EUE-LONG-A8
3-1/2	3.33	3.24	3.76	0.21	4.35	5.87	2.50	75	0400-EUE-LONG-B8
4	3.98	3.89	4.49	0.26	4.85	6.31	3.38	101	0412-EUE-LONG-A8
5	4.42	4.33	4.99	0.28	5.60	7.44	4.33	130	0512-CSG-LTC-B8
6	5.43	5.33	6.12	0.35	6.73	8.84	6.45	193	0658-CSG-LTC-C8
6L	6.21	6.11	7.00	0.40	7.10	8.94	7.73	232	0700-CSG-LTC-C8
8	7.84	7.75	8.85	0.50	9.73	12.81	13.80	414	0858-CSG-LTC-B8
10	8.85	8.76	9.99	0.57	10.85	14.25	17.70	531	1034-CSG-STC-B8

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint,f. TC = Threaded & Coupled) .
4. Not all sizes are available as monogrammed.

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	1,500	2,250	1,300	9,000	113	AFA
2-1/2	1,500	2,250	1,300	14,000	140	BCA
3	1,500	2,250	1,300	20,500	170	BIA
3-1/2	1,500	2,250	1,300	25,000	189	CFA
4	1,500	2,250	1,300	36,000	226	CIA
5	1,500	2,250	1,300	44,000	251	DFA
6	1,500	2,250	1,300	66,500	308	EIA
6L	1,500	2,250	1,300	83,500	352	ERA
8	1,500	2,250	1,300	136,500	445	GCA
10	1,500	2,250	1,300	157,500	502	IFA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Flowstrong® Yellow Box® 1750 API 15HR

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.30	0.15	2.69	3.74	1.05	32	0238-EUE-LONG-A8
2-1/2	2.47	2.37	2.84	0.19	3.19	4.34	1.55	47	0278-EUE-LONG-A8
3	3.00	2.90	3.45	0.23	3.85	5.20	2.28	68	0312-EUE-LONG-A8
3-1/2	3.33	3.24	3.84	0.25	4.35	5.93	2.90	87	0400-EUE-LONG-B8
4	3.98	3.89	4.59	0.30	4.85	6.39	3.92	118	0412-EUE-LONG-A8
5	4.42	4.33	5.09	0.34	5.60	7.53	4.99	150	0512-CSG-LTC-B8
6	5.43	5.33	6.25	0.41	6.73	8.96	7.48	224	0658-CSG-LTC-C8
6L	6.21	6.11	7.15	0.47	7.73	10.33	9.79	294	0700-CSG-LTC-C8
8	7.84	7.75	9.03	0.59	9.73	13.00	15.85	476	0858-CSG-LTC-B8

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint,f. TC = Threaded & Coupled) .
4. Not all sizes are available as monogrammed.

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	1,750	2,625	2,000	11,000	116	AFA
2-1/2	1,750	2,625	2,000	16,500	143	BCA
3	1,750	2,625	2,000	24,500	174	BIA
3-1/2	1,750	2,625	2,000	30,000	193	CFA
4	1,750	2,625	2,000	43,000	231	CIA
5	1,750	2,625	2,000	53,000	256	DFA
6	1,750	2,625	2,000	79,500	314	EIA
6L	1,750	2,625	2,000	83,500	360	ERA
8	1,750	2,625	2,000	136,500	454	GCA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Flowstrong® Yellow Box® 2000 API 15HR

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.35	0.18	2.69	3.77	1.19	36	0238-EUE-LONG-A8
2-1/2	2.47	2.37	2.90	0.22	3.19	4.38	1.76	53	0278-EUE-LONG-A8
3	3.00	2.90	3.52	0.26	3.85	5.25	2.63	79	0312-EUE-LONG-A8
3-1/2	3.33	3.24	3.91	0.29	4.35	5.99	3.29	99	0400-EUE-LONG-B8
4	3.98	3.89	4.68	0.35	4.85	6.47	4.48	134	0412-EUE-LONG-A8
5	4.42	4.33	5.20	0.39	5.60	7.63	5.71	171	0512-CSG-LTC-B8
6	5.43	5.33	6.38	0.48	6.73	9.08	8.54	256	0658-CSG-LTC-C8
6L	6.21	6.11	7.29	0.54	7.73	10.48	11.17	335	0700-CSG-LTC-C8
8	7.84	7.75	9.22	0.69	9.73	13.20	18.04	541	0858-CSG-LTC-B8

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint,f. TC = Threaded & Coupled) .
4. Not all sizes are available as monogrammed.

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	2,000	3,000	2,600	12,500	118	AFA
2-1/2	2,000	3,000	2,600	19,000	146	BCA
3	2,000	3,000	2,600	28,500	177	BIA
3-1/2	2,000	3,000	2,600	35,000	197	CFA
4	2,000	3,000	2,600	44,500	236	CIA
5	2,000	3,000	2,600	53,500	262	DFA
6	2,000	3,000	2,600	80,500	321	EIA
6L	2,000	3,000	2,600	83,500	367	ERA
8	2,000	3,000	2,600	136,500	464	GCA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Flowstrong® Yellow Box® 2250 API 15HR

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.40	0.20	2.69	3.80	1.34	40	0238-EUE-LONG-A8
2-1/2	2.47	2.37	2.96	0.25	3.19	4.42	1.99	60	0278-EUE-LONG-A8
3	3.00	2.90	3.60	0.30	3.85	5.31	2.96	89	0312-EUE-LONG-A8
3-1/2	3.33	3.24	4.00	0.33	4.35	6.06	3.71	111	0400-EUE-LONG-B8
4	3.98	3.89	4.78	0.40	4.85	6.55	5.09	153	0412-EUE-LONG-A8
5	4.42	4.33	5.31	0.44	5.60	7.72	6.44	193	0512-CSG-LTC-B8
6	5.43	5.33	6.51	0.54	6.73	9.20	9.64	289	0658-CSG-LTC-C8
6L	6.21	6.11	7.45	0.62	7.73	10.63	12.61	378	0700-CSG-LTC-C8
8	7.84	7.75	9.41	0.78	9.73	12.95	20.70	621	0858-CSG-LTC-B8

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint,f. TC = Threaded & Coupled) .
4. Not all sizes are available as monogrammed.

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	2,250	3,375	2,900	14,500	121	AFA
2-1/2	2,250	3,375	2,900	22,000	149	BCA
3	2,250	3,375	2,900	30,500	181	BIA
3-1/2	2,250	3,375	2,900	40,000	201	CFA
4	2,250	3,375	2,900	53,500	241	CIA
5	2,250	3,375	2,900	53,500	267	DFA
6	2,250	3,375	2,900	85,000	328	EIA
6L	2,250	3,375	2,900	83,500	375	ERA
8	2,250	3,375	2,900	179,500	459	GCA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Flowstrong® Yellow Box® 2500 API 15HR

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.47	0.24	2.69	3.58	1.5	45	0238-EUE-LONG-A8
2-1/2	2.47	2.37	3.05	0.29	3.85	6.00	2.8	83	0278-EUE-LONG-A8
3	3.00	2.90	3.71	0.35	3.85	5.10	3.3	99	0312-EUE-LONG-A8
3-1/2	3.33	3.24	4.12	0.39	4.35	6.01	4.2	126	0400-EUE-LONG-B8
4	3.98	3.89	4.93	0.47	5.60	7.70	6.5	195	0412-EUE-LONG-A8
5	4.42	4.33	5.47	0.52	6.73	10.50	9.3	278	0512-CSG-LTC-B8
6	5.43	5.33	6.71	0.64	7.10	9.00	11.3	340	0658-CSG-LTC-C8
6L	6.21	6.12	7.60	0.70	7.73	10.34	14.68	440	0700-CSG-LTC-C8

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint,f. TC = Threaded & Coupled) .
4. Not all sizes are available as monogrammed.

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	2,500	3,750	3,200	16,500	124	AFA
2-1/2	2,500	3,750	3,200	25,500	152	BCA
3	2,500	3,750	3,200	30,500	185	BIA
3-1/2	2,500	3,750	3,200	40,000	206	CFA
4	2,500	3,750	3,200	53,500	246	CIA
5	2,500	3,750	3,200	80,500	273	DFA
6	2,500	3,750	3,200	85,000	335	EIA
6L	2,500	3,750	3,200	127,500	370	ERA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	Btu/hr/ft^2/in/degF	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Flowstrong® Yellow Box® 2750 API 15HR

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.50	0.25	3.19	4.42	1.94	58	0238-EUE-LONG-A8
2-1/2	2.47	2.37	3.09	0.31	3.85	5.37	2.92	88	0278-EUE-LONG-A8
3	3.00	2.90	3.75	0.38	4.35	5.97	4.13	124	0312-EUE-LONG-A8
3-1/2	3.33	3.24	4.17	0.42	4.85	6.74	5.10	153	0400-EUE-LONG-B8
4	3.98	3.89	4.98	0.50	5.60	7.76	7.17	215	0412-EUE-LONG-A8
5	4.42	4.33	5.53	0.56	6.73	9.72	9.73	292	0512-CSG-LTC-B8
6	5.43	5.33	6.79	0.68	7.10	9.77	13.25	397	0658-CSG-LTC-C8
6L	6.21	6.12	7.76	0.78	7.73	10.50	16.26	488	0700-CSG-LTC-C8

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint,f. TC = Threaded & Coupled) .
4. Not all sizes are available as monogrammed.

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	2,750	4,125	3,500	16,500	126	AFA
2-1/2	2,750	4,125	3,500	28,500	156	BCA
3	2,750	4,125	3,500	40,000	189	BIA
3-1/2	2,750	4,125	3,500	44,500	210	CFA
4	2,750	4,125	3,500	53,500	252	CIA
5	2,750	4,125	3,500	72,500	268	DFA
6	2,750	4,125	3,500	109,500	329	EIA
6L	2,750	4,125	3,500	143,000	377	ERA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	Btu/hr/ft^2/in/degF	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Flowstrong® Yellow Box® 3000 API 15HR

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2	2.00	1.91	2.56	0.28	3.19	4.45	2.11	63	0238-EUE-LONG-A8
2-1/2	2.47	2.37	3.15	0.34	3.85	5.42	3.19	96	0278-EUE-LONG-A8
3	3.00	2.90	3.83	0.42	4.35	6.03	4.52	136	0312-EUE-LONG-A8
3-1/2	3.33	3.24	4.26	0.46	4.85	6.81	5.60	168	0400-EUE-LONG-B8
4	3.98	3.89	5.09	0.55	5.60	7.85	7.86	236	0412-EUE-LONG-A8
5	4.42	4.33	5.65	0.61	6.73	9.83	10.59	318	0512-CSG-LTC-B8
6	5.43	5.33	6.93	0.75	7.10	9.90	14.52	435	0658-CSG-LTC-C8

1. Depending on the application, smaller Max. Box O.D. are available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint,f. TC = Threaded & Coupled) .
4. Not all sizes are available as monogrammed.

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Bending	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Radius (ft)	Code
2	3,000	4,500	3,800	21,000	129	AFA
2-1/2	3,000	4,500	3,800	30,500	159	BCA
3	3,000	4,500	3,800	40,000	194	BIA
3-1/2	3,000	4,500	3,800	44,500	215	CFA
4	3,000	4,500	3,800	65,500	246	CIA
5	3,000	4,500	3,800	81,000	273	DFA
6	3,000	4,500	3,800	122,000	335	EIA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value	Test Method
Tensile Strength, Hoop	psi	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	1.5	ASTM D2105
Specific Gravity	---	1.9	ASTM D792
Density	lbs/in^3	0.07	ASTM D792
Thermal Conductivity	Btu/hr/ft^2/in/degF	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.2	ASTM D696
Flow Factor	---	150	Hazen Williams

Appendix C - Geostrong™ Red Box® Technical Data Sheets

Geostrong™ Red Box® 1000

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2-3/8	2.00	1.91	2.15	0.08	2.69	3.47	0.6	18	0238-EUE-LONG-A8
2-7/8	2.47	2.37	2.66	0.10	3.19	4.04	0.9	27	0278-EUE-LONG-A8
3-1/2	3.00	2.90	3.24	0.12	3.85	4.86	1.4	41	0312-EUE-LONG-A8
4	3.33	3.24	3.59	0.13	4.35	5.55	1.7	52	0400-EUE-LONG-B8
4-1/2	3.98	3.89	4.29	0.15	4.85	5.94	2.2	65	0412-EUE-LONG-A8
5-1/2	4.42	4.33	4.77	0.17	5.60	7.04	2.9	88	0512-CSG-LTC-B8
6-5/8	5.43	5.33	5.85	0.21	6.73	8.36	4.3	130	0658-CSG-LTC-C8
7	6.21	6.11	6.69	0.24	7.10	8.41	4.9	147	0700-CSG-LTC-C8
8-5/8	7.84	7.75	8.44	0.30	8.73	10.14	7.6	227	0858-CSG-LTC-B8
10-3/4	8.85	8.76	9.53	0.34	10.85	13.49	12.0	360	1034-CSG-STC-B8
11-3/4	10.72	10.63	11.46	0.37	12.14	13.95	14.2	425	1134-CSG-STC-Z6
13-3/8	11.97	11.87	12.79	0.41	13.64	15.63	18.1	543	1338-CSG-STC-B4
16	14.48	14.39	15.48	0.50	16.32	18.73	26.6	797	1600-CSG-STC-B4
18	16.55	16.46	17.70	0.57	18.89	22.01	36.4	1,093	1800-CSG-STC-B4
20	17.98	17.89	19.22	0.62	20.26	23.51	42.1	1,264	2000-CSG-STC-Z6
22	19.69	19.60	21.05	0.68	22.53	26.55	50.1	1,878	2200-CSG-STC-Z4
26	23.57	23.48	25.20	0.81	26.81	31.66	74.8	2,807	2600-CSG-STC-C4

1. . +/- 0.10" up to 9-5/8"; +/- 0.15" above 9-5/8". Depending on the application, smaller Box O.D.s may be available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Stretch vs Tension	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Stretch (ft) = Coeff. x P x L	Code
2-3/8	1,000	1,300	310	8,000	0.769	AFA
2-7/8	1,000	1,300	350	12,500	0.457	BCA
3-1/2	1,000	1,300	370	19,000	0.294	BIA
4	1,000	1,300	350	22,500	0.252	CFA
4-1/2	1,000	1,300	310	31,000	0.193	CIA
5-1/2	1,000	1,300	330	39,500	0.148	DFA
6-5/8	1,000	1,300	330	59,000	0.099	EIA
7	1,000	1,300	330	77,500	0.075	ERA
8-5/8	1,000	1,300	310	119,000	0.050	GCA
10-3/4	1,000	1,300	310	154,500	0.039	IFA
11-3/4	1,000	1,300	240	135,500	0.046	JLC
13-3/8	1,000	1,300	240	169,000	0.037	LIC
16	1,000	1,300	240	247,500	0.025	NBC
18	1,000	1,300	240	323,500	0.019	OFC
20	1,000	1,300	240	375,000	0.016	PRC
22	1,000	1,300	240	457,500	0.014	QCC
26	1,000	1,300	240	655,500	0.009	SCC

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value 2-3/8 - 10-3/4	Value 11-3/4 - 30	Test Method
Tensile Strength, Hoop	psi	31,300	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	30,000	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	30,000	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	3.0	1.5	ASTM D2105
Specific Gravity	---	1.9	1.9	ASTM D792
Density	lbs/in^3	0.07	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.1	1.2	ASTM D696
Flow Factor	---	150	150	Hazen Williams

Geostrong™ Red Box® 1250

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2-3/8	2.00	1.91	2.20	0.10	2.69	3.50	0.7	22	0238-EUE-LONG-A8
2-7/8	2.47	2.37	2.70	0.12	3.19	4.06	1.0	31	0278-EUE-LONG-A8
3-1/2	3.00	2.90	3.29	0.15	3.85	4.89	1.6	47	0312-EUE-LONG-A8
4	3.33	3.24	3.66	0.17	4.35	5.59	2.0	61	0400-EUE-LONG-B8
4-1/2	3.98	3.89	4.38	0.20	4.85	6.00	2.7	81	0412-EUE-LONG-A8
5-1/2	4.42	4.33	4.85	0.22	5.60	7.10	3.4	103	0512-CSG-LTC-B8
6-5/8	5.43	5.33	5.95	0.26	6.73	8.44	5.1	153	0658-CSG-LTC-C8
7	6.21	6.11	6.80	0.30	7.10	8.50	5.9	178	0700-CSG-LTC-C8
9-5/8	7.84	7.75	8.60	0.38	9.73	12.28	11.0	330	0858-CSG-LTC-B8
10-3/4	8.85	8.76	9.71	0.43	10.85	13.67	14.2	427	1034-CSG-STC-B8
11-3/4	10.72	10.63	11.65	0.47	12.14	14.14	17.1	513	1134-CSG-STC-Z6
13-3/8	11.97	11.87	13.01	0.52	14.36	17.30	25.3	759	1338-CSG-STC-B4
16	14.48	14.39	15.74	0.63	16.32	19.02	31.9	956	1600-CSG-STC-B4
18	16.55	16.46	18.00	0.72	18.89	22.37	43.4	1,302	1800-CSG-STC-B4
20	17.98	17.89	19.55	0.78	20.26	23.91	50.3	1,510	2000-CSG-STC-Z6
22	19.69	19.60	21.41	0.86	22.53	27.01	60.1	2,255	2200-CSG-STC-Z4

1. . +/- 0.10" up to 9-5/8"; +/- 0.15" above 9-5/8". Depending on the application, smaller Box O.D.s may be available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Stretch vs Tension	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Stretch (ft) = Coeff. x P x L	Code
2-3/8	1,250	1,625	640	10,500	0.552	AFA
2-7/8	1,250	1,625	570	15,000	0.404	BCA
3-1/2	1,250	1,625	600	22,500	0.261	BIA
4	1,250	1,625	640	29,000	0.199	CFA
4-1/2	1,250	1,625	650	41,500	0.139	CIA
5-1/2	1,250	1,625	610	49,500	0.119	DFA
6-5/8	1,250	1,625	590	74,000	0.081	EIA
7	1,250	1,625	590	85,000	0.062	ERA
9-5/8	1,250	1,625	590	136,500	0.039	GCA
10-3/4	1,250	1,625	610	157,500	0.030	IFA
11-3/4	1,250	1,625	450	153,500	0.036	JLC
13-3/8	1,250	1,625	450	215,000	0.029	LIC
16	1,250	1,625	450	315,000	0.020	NBC
18	1,250	1,625	450	411,500	0.015	OFC
20	1,250	1,625	450	485,500	0.013	PRC
22	1,250	1,625	450	582,500	0.011	QCC

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value 2-3/8 - 10-3/4	Value 11-3/4 - 30	Test Method
Tensile Strength, Hoop	psi	31,300	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	30,000	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	30,000	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	3.0	1.5	ASTM D2105
Specific Gravity	---	1.9	1.9	ASTM D792
Density	lbs/in^3	0.07	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.1	1.2	ASTM D696
Flow Factor	---	150	150	Hazen Williams

Geostrong™ Red Box® 1500

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight (lbs/ft)	Nominal Weight (lbs/jt)	Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
2-3/8	2.00	1.91	2.23	0.12	2.69	3.51	0.8	25	0238-EUE-LONG-A8
2-7/8	2.47	2.37	2.76	0.15	3.19	4.09	1.2	37	0278-EUE-LONG-A8
3-1/2	3.00	2.90	3.35	0.18	3.85	4.92	1.8	55	0312-EUE-LONG-A8
4	3.33	3.24	3.73	0.20	4.35	5.64	2.4	71	0400-EUE-LONG-B8
4-1/2	3.98	3.89	4.46	0.24	4.85	6.06	3.1	94	0412-EUE-LONG-A8
5-1/2	4.42	4.33	4.94	0.26	5.60	7.16	4.0	120	0512-CSG-LTC-B8
6-5/8	5.43	5.33	6.07	0.32	6.73	8.53	6.0	180	0658-CSG-LTC-C8
7	6.21	6.11	6.94	0.37	7.10	8.61	7.1	213	0700-CSG-LTC-C8
9-5/8	7.84	7.75	8.75	0.46	9.73	12.42	12.7	381	0858-CSG-LTC-B8
10-3/4	8.85	8.76	9.89	0.52	10.85	13.83	16.4	491	1034-CSG-STC-B8
11-3/4	10.72	10.63	11.85	0.57	12.14	14.35	20.1	603	1134-CSG-STC-Z6
*13-3/8	11.97	11.87	13.23	0.63	14.36	17.54	29.1	872	1338-CSG-STC-B4
*16	14.48	14.39	16.01	0.76	17.08	20.84	41.1	1,234	1600-CSG-STC-B4
18	16.55	16.46	18.30	0.87	18.89	22.73	50.6	1,518	1800-CSG-STC-B4
*20	17.98	17.89	19.88	0.95	20.26	24.32	58.8	1,765	2000-CSG-STC-Z6

1. . +/- 0.10" up to 9-5/8"; +/- 0.15" above 9-5/8". Depending on the application, smaller Box O.D.s may be available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure Rating (psi)	Standard Factory Test Pressure (psi)	Collapse Rating (psi)	Axial Tension Rating (lbs)	Stretch vs Tension Stretch (ft) = Coeff. x P x L	Jt Shrt Code
2-3/8	1,500	1,950	960	12,000	0.498	AFA
2-7/8	1,500	1,950	1,100	19,000	0.315	BCA
3-1/2	1,500	1,950	1,100	28,000	0.210	BIA
4	1,500	1,950	1,100	35,000	0.164	CFA
4-1/2	1,500	1,950	1,100	44,500	0.116	CIA
5-1/2	1,500	1,950	1,000	53,500	0.099	DFA
6-5/8	1,500	1,950	1,100	80,500	0.064	EIA
7	1,500	1,950	1,000	85,000	0.050	ERA
9-5/8	1,500	1,950	1,000	136,500	0.032	GCA
10-3/4	1,500	1,950	1,000	157,500	0.025	IFA
11-3/4	1,500	1,950	750	153,500	0.029	JLC
*13-3/8	1,500	1,950	750	263,000	0.024	LIC
*16	1,500	1,950	750	385,000	0.016	NBC
18	1,500	1,950	750	503,500	0.012	OFC
*20	1,500	1,950	750	560,000	0.010	PRC

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value 2-3/8 - 10-3/4	Value 11-3/4 - 30	Test Method
Tensile Strength, Hoop	psi	31,300	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	30,000	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	30,000	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	3.0	1.5	ASTM D2105
Specific Gravity	---	1.9	1.9	ASTM D792
Density	lbs/in^3	0.07	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.1	1.2	ASTM D696
Flow Factor	---	150	150	Hazen Williams

Geostrong™ Red Box® 1750

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight (lbs/ft)	Nominal Weight (lbs/jt)	Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
2-3/8	2.00	1.91	2.28	0.14	2.69	3.53	1.0	29	0238-EUE-LONG-A8
2-7/8	2.47	2.37	2.81	0.17	3.19	4.12	1.4	43	0278-EUE-LONG-A8
3-1/2	3.00	2.90	3.42	0.21	3.85	4.96	2.1	63	0312-EUE-LONG-A8
4	3.33	3.24	3.79	0.23	4.35	5.67	2.6	79	0400-EUE-LONG-B8
4-1/2	3.98	3.89	4.54	0.28	4.85	6.11	3.6	109	0412-EUE-LONG-A8
5-1/2	4.42	4.33	5.03	0.30	5.60	7.23	4.6	137	0512-CSG-LTC-B8
6-5/8	5.43	5.33	6.17	0.37	6.73	8.62	6.8	205	0658-CSG-LTC-C8
7-5/8	6.21	6.11	7.07	0.43	7.73	9.97	9.0	270	0700-CSG-LTC-C8
9-5/8	7.84	7.75	8.93	0.54	9.73	12.58	14.6	438	0858-CSG-LTC-B8
10-3/4	8.85	8.76	10.06	0.61	10.85	14.00	18.5	555	1034-CSG-STC-B8
11-3/4	10.72	10.63	12.05	0.67	13.02	16.12	26.4	791	1134-CSG-STC-Z6
*13-3/8	11.97	11.87	13.45	0.74	14.36	17.78	33.0	989	1338-CSG-STC-B4

1. . +/- 0.10" up to 9-5/8"; +/- 0.15" above 9-5/8". Depending on the application, smaller Box O.D.s may be available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure Rating (psi)	Standard Factory Test Pressure (psi)	Collapse Rating (psi)	Axial Tension Rating (lbs)	Stretch vs Tension Stretch (ft) = Coeff. x P x L	Jt Shrt Code
2-3/8	1,750	2,275	1,600	15,000	0.393	AFA
2-7/8	1,750	2,275	1,600	22,500	0.257	BCA
3-1/2	1,750	2,275	1,600	30,500	0.175	BIA
4	1,750	2,275	1,500	40,000	0.150	CFA
4-1/2	1,750	2,275	1,600	44,500	0.099	CIA
5-1/2	1,750	2,275	1,500	53,500	0.085	DFA
6-5/8	1,750	2,275	1,600	80,500	0.056	EIA
7-5/8	1,750	2,275	1,600	83,500	0.042	ERA
9-5/8	1,750	2,275	1,600	136,500	0.026	GCA
10-3/4	1,750	2,275	1,500	157,500	0.021	IFA
11-3/4	1,750	2,275	1,200	238,000	0.025	JLC
*13-3/8	1,750	2,275	1,200	313,000	0.020	LIC

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value 2-3/8 - 10-3/4	Value 11-3/4 - 30	Test Method
Tensile Strength, Hoop	psi	31,300	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	30,000	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	30,000	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	3.0	1.5	ASTM D2105
Specific Gravity	---	1.9	1.9	ASTM D792
Density	lbs/in^3	0.07	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.1	1.2	ASTM D696
Flow Factor	---	150	150	Hazen Williams

Geostrong™ Red Box® 2000

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2-3/8	2.00	1.91	2.33	0.16	2.69	3.56	1.1	34	0238-EUE-LONG-A8
2-7/8	2.47	2.37	2.87	0.20	3.19	4.15	1.6	49	0278-EUE-LONG-A8
3-1/2	3.00	2.90	3.48	0.24	3.85	5.00	2.4	72	0312-EUE-LONG-A8
4	3.33	3.24	3.86	0.26	4.35	5.72	3.0	90	0400-EUE-LONG-B8
4-1/2	3.98	3.89	4.62	0.32	4.85	6.17	4.1	123	0412-EUE-LONG-A8
5-1/2	4.42	4.33	5.13	0.36	5.60	7.30	5.3	158	0512-CSG-LTC-B8
6-5/8	5.43	5.33	6.29	0.43	6.73	8.71	7.8	234	0658-CSG-LTC-C8
7-5/8	6.21	6.11	7.19	0.49	7.73	10.07	10.1	304	0700-CSG-LTC-C8
9-5/8	7.84	7.75	9.09	0.62	9.73	12.72	16.5	494	0858-CSG-LTC-B8
10-3/4	8.85	8.76	10.26	0.70	10.85	14.18	21.0	631	1034-CSG-STC-B8

1. . +/- 0.10" up to 9-5/8"; +/- 0.15" above 9-5/8". Depending on the application, smaller Box O.D.s may be available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Stretch vs Tension	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Stretch (ft) = Coeff. x P x L	Code
2-3/8	2,000	2,600	2,400	16,500	0.323	AFA
2-7/8	2,000	2,600	2,400	22,500	0.216	BCA
3-1/2	2,000	2,600	2,300	30,500	0.149	BIA
4	2,000	2,600	2,200	40,000	0.128	CFA
4-1/2	2,000	2,600	2,300	44,500	0.086	CIA
5-1/2	2,000	2,600	2,300	53,500	0.070	DFA
6-5/8	2,000	2,600	2,300	80,500	0.047	EIA
7-5/8	2,000	2,600	2,200	83,500	0.037	ERA
9-5/8	2,000	2,600	2,300	136,500	0.023	GCA
10-3/4	2,000	2,600	2,200	157,500	0.018	IFA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value 2-3/8 - 10-3/4	Value 11-3/4 - 30	Test Method
Tensile Strength, Hoop	psi	31,300	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	30,000	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	30,000	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	3.0	1.5	ASTM D2105
Specific Gravity	---	1.9	1.9	ASTM D792
Density	lbs/in^3	0.07	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.1	1.2	ASTM D696
Flow Factor	---	150	150	Hazen Williams

Geostrong™ Red Box® 2250

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2-3/8	2.00	1.91	2.36	0.18	2.69	3.57	1.2	37	0238-EUE-LONG-A8
2-7/8	2.47	2.37	2.91	0.22	3.19	4.17	1.8	54	0278-EUE-LONG-A8
3-1/2	3.00	2.90	3.55	0.28	3.85	5.04	2.7	82	0312-EUE-LONG-A8
4	3.33	3.24	3.93	0.30	4.35	5.76	3.4	101	0400-EUE-LONG-B8
4-1/2	3.98	3.89	4.71	0.36	4.85	6.22	4.6	139	0412-EUE-LONG-A8
5-1/2	4.42	4.33	5.22	0.40	5.60	7.37	5.9	176	0512-CSG-LTC-B8
6-5/8	5.43	5.33	6.42	0.50	6.73	8.81	8.8	265	0658-CSG-LTC-C8
7-5/8	6.21	6.11	7.32	0.56	7.73	10.18	11.4	342	0700-CSG-LTC-C8
9-5/8	7.84	7.75	9.25	0.71	9.73	12.87	18.4	552	0858-CSG-LTC-B8
10-3/4	8.85	8.76	10.44	0.79	10.85	14.35	23.4	703	1034-CSG-STC-B8

1. . +/- 0.10" up to 9-5/8"; +/- 0.15" above 9-5/8". Depending on the application, smaller Box O.D.s may be available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Stretch vs Tension	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Stretch (ft) = Coeff. x P x L	Code
2-3/8	2,250	2,925	2,600	16,500	0.302	AFA
2-7/8	2,250	2,925	2,600	22,500	0.201	BCA
3-1/2	2,250	2,925	2,700	30,500	0.130	BIA
4	2,250	2,925	2,600	40,000	0.111	CFA
4-1/2	2,250	2,925	2,600	44,500	0.076	CIA
5-1/2	2,250	2,925	2,600	53,500	0.062	DFA
6-5/8	2,250	2,925	2,700	80,500	0.040	EIA
7-5/8	2,250	2,925	2,600	116,500	0.032	ERA
9-5/8	2,250	2,925	2,600	224,000	0.020	GCA
10-3/4	2,250	2,925	2,600	258,000	0.016	IFA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value 2-3/8 - 10-3/4	Value 11-3/4 - 30	Test Method
Tensile Strength, Hoop	psi	31,300	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	30,000	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	30,000	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	3.0	1.5	ASTM D2105
Specific Gravity	---	1.9	1.9	ASTM D792
Density	lbs/in^3	0.07	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.1	1.2	ASTM D696
Flow Factor	---	150	150	Hazen Williams

Geostrong™ Red Box® 2500

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2-3/8	2.00	1.91	2.41	0.21	2.69	3.60	1.4	41	0238-EUE-LONG-A8
2-7/8	2.47	2.37	2.97	0.25	3.19	4.20	2.0	61	0278-EUE-LONG-A8
3-1/2	3.00	2.90	3.60	0.30	3.85	5.07	3.0	89	0312-EUE-LONG-A8
4	3.33	3.24	4.00	0.34	4.35	5.81	3.7	112	0400-EUE-LONG-B8
4-1/2	3.98	3.89	4.79	0.40	4.85	6.28	5.1	154	0412-EUE-LONG-A8
5-1/2	4.42	4.33	5.31	0.45	5.60	7.44	6.5	194	0512-CSG-LTC-B8
6-5/8	5.43	5.33	6.54	0.56	6.73	8.91	9.9	296	0658-CSG-LTC-C8
7-5/8	6.21	6.11	7.45	0.62	7.73	10.29	12.6	377	0700-CSG-LTC-C8
9-5/8	7.84	7.75	9.42	0.79	9.73	13.02	20.4	611	0858-CSG-LTC-B8
10-3/4	8.85	8.76	10.64	0.89	11.11	14.75	27.7	832	1034-CSG-STC-B8

1. . +/- 0.10" up to 9-5/8"; +/- 0.15" above 9-5/8". Depending on the application, smaller Box O.D.s may be available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Stretch vs Tension	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Stretch (ft) = Coeff. x P x L	Code
2-3/8	2,500	3,250	3,000	16,500	0.257	AFA
2-7/8	2,500	3,250	2,900	22,500	0.174	BCA
3-1/2	2,500	3,250	2,900	30,500	0.121	BIA
4	2,500	3,250	2,900	40,000	0.098	CFA
4-1/2	2,500	3,250	2,900	53,500	0.068	CIA
5-1/2	2,500	3,250	2,900	53,500	0.055	DFA
6-5/8	2,500	3,250	2,900	85,000	0.035	EIA
7-5/8	2,500	3,250	2,900	83,500	0.033	ERA
9-5/8	2,500	3,250	2,900	136,500	0.018	GCA
10-3/4	2,500	3,250	2,900	258,000	0.014	IFA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value 2-3/8 - 10-3/4	Value 11-3/4 - 30	Test Method
Tensile Strength, Hoop	psi	31,300	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	30,000	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	30,000	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	3.0	1.5	ASTM D2105
Specific Gravity	---	1.9	1.9	ASTM D792
Density	lbs/in^3	0.07	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.1	1.2	ASTM D696
Flow Factor	---	150	150	Hazen Williams

Geostrong™ Red Box® 2750

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2-3/8	2.00	1.91	2.45	0.22	3.19	4.31	1.7	52	0238-EUE-LONG-A8
2-7/8	2.47	2.37	3.03	0.28	3.85	5.24	2.7	81	0278-EUE-LONG-A8
3-1/2	3.00	2.90	3.68	0.34	4.35	5.81	3.8	113	0312-EUE-LONG-A8
4	3.33	3.24	4.09	0.38	4.85	6.56	4.7	140	0400-EUE-LONG-B8
4-1/2	3.98	3.89	4.88	0.45	5.60	7.53	6.4	193	0412-EUE-LONG-A8
5-1/2	4.42	4.33	5.42	0.50	6.73	9.47	8.9	267	0512-CSG-LTC-B8
6-5/8	5.43	5.33	6.67	0.62	7.10	9.46	12.1	363	0658-CSG-LTC-C8
7-5/8	6.21	6.11	7.59	0.69	7.73	10.10	14.4	433	0700-CSG-LTC-C8

1. . +/- 0.10" up to 9-5/8"; +/- 0.15" above 9-5/8". Depending on the application, smaller Box O.D.s may be available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Stretch vs Tension	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Stretch (ft) = Coeff. x P x L	Code
2-3/8	2,750	3,575	3,200	16,500	0.242	AFA
2-7/8	2,750	3,575	3,200	22,500	0.153	BCA
3-1/2	2,750	3,575	3,200	30,500	0.102	BIA
4	2,750	3,575	3,200	40,000	0.083	CFA
4-1/2	2,750	3,575	3,200	53,500	0.061	CIA
5-1/2	2,750	3,575	3,200	80,500	0.048	DFA
6-5/8	2,750	3,575	3,200	85,000	0.031	EIA
7-5/8	2,750	3,575	3,200	116,500	0.026	ERA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value 2-3/8 - 10-3/4	Value 11-3/4 - 30	Test Method
Tensile Strength, Hoop	psi	31,300	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	30,000	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	30,000	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	3.0	1.5	ASTM D2105
Specific Gravity	---	1.9	1.9	ASTM D792
Density	lbs/in^3	0.07	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.1	1.2	ASTM D696
Flow Factor	---	150	150	Hazen Williams

Geostrong™ Red Box® 3000

Dimensional Specifications

Nominal Size (inches)	Nominal I.D. (inches)	Maximum Drift Dia (inches)	Total Min. O.D. (inches)	Total Min. Thickness (inches)	Pin Upset O.D. (inches)	Max Box OD[1] (inches)	Nominal Weight		Connection Type API 5B, Table 1*, 4**, 8*** 16th Edition January 2021
							(lbs/ft)	(lbs/jt)	
2-3/8	2.00	1.91	2.50	0.25	3.19	4.34	1.9	57	0238-EUE-LONG-A8
2-7/8	2.47	2.37	3.09	0.31	3.85	5.27	2.9	88	0278-EUE-LONG-A8
3-1/2	3.00	2.90	3.74	0.37	4.35	5.85	4.1	122	0312-EUE-LONG-A8
4	3.33	3.24	4.15	0.41	4.85	6.60	5.0	150	0400-EUE-LONG-B8
4-1/2	3.98	3.89	4.98	0.50	5.60	7.60	7.1	213	0412-EUE-LONG-A8
5-1/2	4.42	4.33	5.52	0.55	6.73	9.54	9.6	287	0512-CSG-LTC-B8
6-5/8	5.43	5.33	6.78	0.68	7.10	9.55	13.1	392	0658-CSG-LTC-C8
7-5/8	6.21	6.11	7.73	0.76	7.73	10.22	15.8	474	0700-CSG-LTC-C8

1. . +/- 0.10" up to 9-5/8"; +/- 0.15" above 9-5/8". Depending on the application, smaller Box O.D.s may be available,
2. Standard Joint Length is 30 ft,
3. (a. Thread lengths may exceed API L4, b. Rd = Round thread per inch, c. EUE = External-Upset Ends, d. Csg = Casing, e. IJ = Intergral Joint, f. TC = Threaded & Coupled)

* Non-standard thread; may not be available.

Performance and Ratings (-60 deg F to +150 deg F)

Nominal Size	Internal Pressure	Standard Factory	Collapse	Axial Tension	Stretch vs Tension	Jt Shrt
	Rating (psi)	Test Pressure (psi)	Rating (psi)	Rating (lbs)	Stretch (ft) = Coeff. x P x L	Code
2-3/8	3,000	3,900	3,500	16,500	0.211	AFA
2-7/8	3,000	3,900	3,500	30,500	0.136	BCA
3-1/2	3,000	3,900	3,500	40,000	0.096	BIA
4	3,000	3,900	3,400	44,500	0.078	CFA
4-1/2	3,000	3,900	3,500	53,500	0.053	CIA
5-1/2	3,000	3,900	3,500	80,500	0.044	DFA
6-5/8	3,000	3,900	3,500	128,500	0.029	EIA
7-5/8	3,000	3,900	3,500	116,500	0.023	ERA

Where: P = Tensile Load (1,000 lbs), L = String Length (1,000 ft). Axial Tension Rating is for biaxial loading.

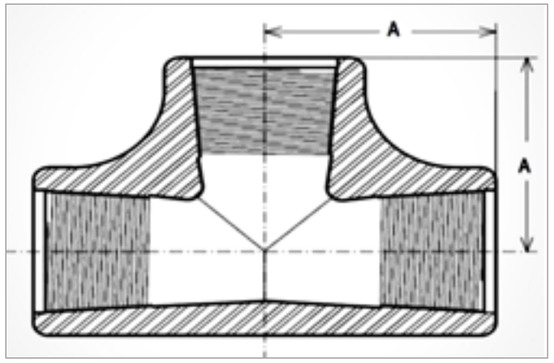
Mechanical and Physical Properties

Tubing/Casing Body Properties	Unit	Value 2-3/8 - 10-3/4	Value 11-3/4 - 30	Test Method
Tensile Strength, Hoop	psi	31,300	40,000	ASTM D1599
Tensile Strength, Axial (biaxial loading)	psi	30,000	20,000	ASTM D1599
Tensile Strength, Axial (uniaxial loading)	psi	30,000	9,400	ASTM D2105
Modulus of Elasticity, Axial	10E+06 psi	3.0	1.5	ASTM D2105
Specific Gravity	---	1.9	1.9	ASTM D792
Density	lbs/in^3	0.07	0.07	ASTM D792
Thermal Conductivity	$Btu/hr/ft^2/in/degF$	2.4	2.4	ASTM C177
Thermal Expansion Coefficient (Linear)	10E-05in/in/degF	1.1	1.2	ASTM D696
Flow Factor	---	150	150	Hazen Williams

Appendix D - Line Pipe Fittings

Tee

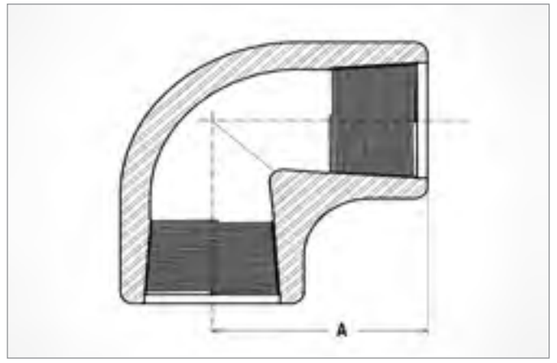
Line Pipe Nominal Size	Thread Size	A
2	2-3/8	6.51
2*	2-7/8	7.65
2-1/2	2-7/8	7.65
2-1/2*	3-1/2	9.85
3	3-1/2	9.85
3*	4	9.50
3-1/2	4	9.50
4	4-1/2	12.11
4*	5-1/2	13.54
5	5-1/2	13.54
6	6-5/8	13.06
6* & 6-L	7	15.82
6-L*	7-5/8	15.79
8	9-5/8	18.40
10	10-3/4	18.80
10-L	11-3/4	19.63
10-L*	11-3/4 L	20.50
12	13-3/8	20.50
12*	13-3/8 L	21.50

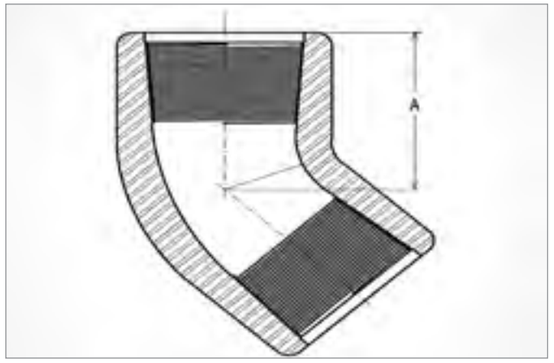


Note:
* = Upsized Thread Size
Please consult with Future Pipe Industries for fitting diameters of more than 12 inches

Elbows

Please contact Future Pipe industries for Elbow 11.25°, Elbow 22.5°, and any other elbow with custom angle





Elbow 90°

Line Pipe Nominal Size	Thread Size	A
2	2-3/8	5.01
2*	2-7/8	5.29
2-1/2	2-7/8	5.29
2-1/2*	3-1/2	5.98
3	3-1/2	5.98
3*	4	7.68
3-1/2	4	7.68
4	4-1/2	7.76
4*	5-1/2	8.59
5	5-1/2	8.59
6	6-5/8	9.66
6* & 6-L	7	10.58
6-L*	7-5/8	10.92
8	9-5/8	14.25
10	10-3/4	12.30
10-L	11-3/4	13.85
10-L*	11-3/4 L	14.97
12	13-3/8	14.88
12*	13-3/8 L	15.88

Note:
* = Upsized Thread Size
Please consult with Future Pipe Industries for fitting diameters of more than 12 inches

Elbow 45°

Line Pipe Nominal Size	Thread Size	A
2	2-3/8	4.15
2*	2-7/8	4.13
2-1/2	2-7/8	4.13
2-1/2*	3-1/2	4.52
3	3-1/2	4.52
3*	4	6.67
3-1/2	4	6.67
4	4-1/2	6.41
4*	5-1/2	7.03
5	5-1/2	7.03
6	6-5/8	8.02
6* & 6-L	7	8.28
6-L*	7-5/8	8.08
8	9-5/8	10.22
10	10-3/4	9.23
10-L	11-3/4	9.72
10-L*	11-3/4 L	10.60
12	13-3/8	11.79
12*	13-3/8 L	11.84

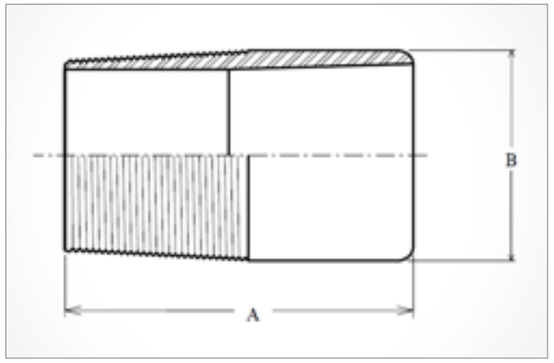
Note:
* = Upsized Thread Size
Please consult with Future Pipe Industries for fitting diameters of more than 12 inches

Field Thread

Tapered bond-on field threads are available in all pipe sizes. Field threads can be installed on site and are used to break into already constructed lines in order to install parts or equipment, such as valves or tees, not originally included when the line was built. Field threads and their installation procedure are detailed in the Flowstrong® Yellow Box® Line pipe Installation section of the catalogue.

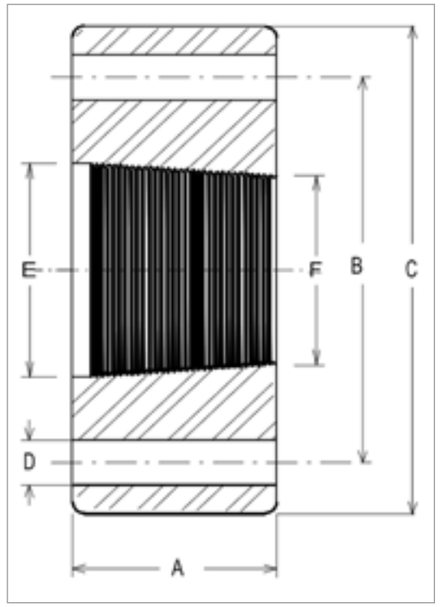
Tee

Nominal Size	Thread Size	A
2	2-3/8	12.13
2 1/2	2-7/8	12.38
3	3-1/2	12.63
3 1/2	4	13.00
4	4-1/2	13.00
5	5-1/2	13.25
6	6-5/8	15.50
6-L	7	15.50
8	9-5/8	16.63
10	10-3/4	18.00



Note:
1- Maximum Pressure Rating based on Field Thread fitting testing is 1250 psi.

Appendix E - Line pipe, Tubing & Casing Fittings



A = Flange Width (L4+0.5)
B = Bolt Circle Diameter
C = Flange Outside Diametef
D = Bolt Hole Diameter
E = "Q" Dimension
F = End Of Thread Id

All Thread Are Api Std. 5b
Moninal Size Yellow Box
2"-4": 8rd Eue Long (Table 14)
5"'-8": 8rd Csg Long (Table 7)
10" : 8rd Csg Short (Table 6)

Note:
* = Upsized Thread Size

Flange

DIMENSIONS - ANSI 150 8RD Thread										
SIZE	Thread Size	A	B	C	D	E	F	BOLT SIZE	BOLT QTY	Washer
2	2-3/8	3.50	4.75	6.00	3/4	2.656	2.32	5/8	4	Standard
2-1/2	2-7/8	3.75	5.50	7.00	3/4	3.156	2.81	5/8	4	Standard
3	3-1/2	4.00	6.00	7.50	3/4	3.813	3.45	5/8	4	Standard
3-1/2	4	4.00	7.00	8.50	3/4	4.313	3.95	5/8	8	Standard
4	4-1/2	4.50	7.50	9.00	3/4	4.813	4.42	5/8	8	Standard
5	5-1/2	4.50	8.50	10.00	7/8	5.594	5.17	3/4	8	Standard
6	6-5/8	4.50	9.50	11.00	7/8	6.719	6.29	3/4	8	Standard
6*, 6-L	7	5.50	9.50	11.00	7/8	7.094	6.60	3/4	8	Standard
6-L*	7-5/8	5.20	9.50	11.00	7/8	7.781	7.24	3/4	8	Narrow
8	9-5/8	6.00	11.75	13.50	7/8	9.781	9.19	3/4	8	Narrow
10	10-3/4	7.25	14.25	16.00	1	10.906	10.24	7/8	12	Standard
10-L	11-3/4	6.50	14.25	16.00	1	11.923	11.29	7/8	12	Narrow
10-L*	11-3/4 L	7.25	14.25	16.00	1	12.640	11.96	7/8	12	Narrow

DIMENSIONS - ANSI 150 4RD Thread										
SIZE	Thread Size	A	B	C	D	E	F	BOLT SIZE	BOLT QTY	Washer
4	4-1/2	4.50	7.50	9.00	3/4	4.81	4.42	5/8	8	Standard
6	6-5/8	5.50	9.50	11.00	7/8	6.99	6.41	3/4	8	Standard
8	9-5/8	7.00	11.75	13.50	7/8	9.98	9.26	3/4	8	Narrow
10	10-3/4	7.25	14.25	16.00	1	10.91	10.24	7/8	12	Standard
12	13-3/8	8.00	17.00	19.00	1	13.54	12.81	7/8	12	Standard

DIMENSIONS - ANSI 300 8RD Thread										
SIZE	Thread Size	A	B	C	D	E	F	BOLT SIZE	BOLT QTY	Washer
2	2-3/8	3.50	5.00	6.50	3/4	2.656	2.32	5/8	8	Standard
2-1/2	2-7/8	3.75	5.88	7.50	7/8	3.156	2.81	3/4	8	Standard
3	3-1/2	4.00	6.63	8.25	7/8	3.813	3.45	3/4	8	Standard
3-1/2	4	4.00	7.25	9.00	7/8	4.313	3.95	3/4	8	Standard
4	4-1/2	4.50	7.88	10.00	7/8	4.813	4.42	3/4	8	Standard
5	5-1/2	4.50	9.25	11.00	7/8	5.594	5.17	3/4	8	Standard
6	6-5/8	4.50	10.63	12.50	7/8	6.719	6.29	3/4	12	Standard
6*, 6-L	7	5.50	10.63	12.50	7/8	7.094	6.60	3/4	12	Standard
6-L*	7-5/8	5.20	10.63	12.50	7/8	7.781	7.24	3/4	12	Standard
8	9-5/8	6.00	13.00	15.00	1	9.781	9.19	7/8	12	Standard
10	10-3/4	7.25	15.25	17.50	1 1/8	10.906	10.24	1	16	Standard
10-L	11-3/4	6.50	15.25	17.50	1 1/8	11.923	11.29	1	16	Standard
10-L*	11-3/4 L	7.25	15.25	17.50	1 1/8	12.640	11.96	1	16	Narrow

DIMENSIONS - ANSI 300 4RD Thread										
SIZE	Thread Size	A	B	C	D	E	F	BOLT SIZE	BOLT QTY	Washer OD
4	4-1/2	4.50	7.88	10.00	7/8	4.81	4.42	3/4	8	Standard
6	6-5/8	5.50	10.63	12.50	7/8	6.99	6.41	3/4	12	Standard
8	9-5/8	7.00	13.00	15.00	1	9.98	9.26	7/8	12	Standard
10	10-3/4	7.25	15.25	17.50	1 1/8	10.91	10.24	1	16	Standard
12	13-3/8	8.00	17.75	20.50	1 1/4	13.54	12.81	1 1/8	16	Standard

Other sizes available by request.

DIMENSIONS - ANSI 600 8RD Thread										
SIZE	Thread Size	A	B	C	D	E	F	BOLT SIZE	BOLT QTY	Washer
2	2-3/8	3.50	5.00	6.50	3/4	2.656	2.32	5/8	8	Standard
2-1/2	2-7/8	3.75	5.88	7.50	7/8	3.156	2.81	3/4	8	Standard
3	3-1/2	4.00	6.63	8.25	7/8	3.813	3.45	3/4	8	Standard
3-1/2	4	4.00	7.25	9.00	1	4.313	3.95	7/8	8	Standard
4	4-1/2	4.50	8.50	10.75	1	4.813	4.42	7/8	8	Standard
5	5-1/2	4.50	10.50	13.00	1 1/8	5.594	5.17	1	8	Standard
6	6-5/8	4.50	11.50	14.00	1 1/8	6.719	6.29	1	12	Standard
6*, 6-L	7	5.50	11.50	14.00	1 1/8	7.094	6.60	1	12	Standard
6-L*	7-5/8	5.20	11.50	14.00	1 1/8	7.781	7.24	1	12	Standard
8	9-5/8	6.00	13.75	16.50	1 1/4	9.781	9.19	1 1/8	12	Standard
10	10-3/4	7.25	17.00	20.00	1 3/8	10.906	10.24	1 1/4	16	Standard
10-L	11-3/4	6.50	17.00	20.00	1 3/8	11.923	11.29	1 1/4	16	Standard
10-L*	11-3/4 L	7.25	17.00	20.00	1 3/8	12.640	11.96	1 1/4	16	Standard

DIMENSIONS - ANSI 600 4RD Thread										
SIZE	Thread Size	A	B	C	D	E	F	BOLT SIZE	BOLT QTY	Washer OD
4	4-1/2	4.50	8.50	10.75	1	4.81	4.42	7/8	8	Standard
6	6-5/8	5.50	11.50	14.00	1 1/8	6.99	6.41	1	12	Standard
8	9-5/8	7.00	13.75	16.50	1 1/4	9.98	9.26	1 1/8	12	Standard
10	10-3/4	7.25	17.00	20.00	1 3/8	10.91	10.24	1 1/4	16	Standard
12	13-3/8	8.00	19.25	22.00	1 3/8	13.54	12.81	1 1/4	20	Standard

Other sizes available by request.

DIMENSIONS - ANSI 900 8RD Thread										
SIZE	Thread Size	A	B	C	D	E	F	BOLT SIZE	BOLT QTY	Washer
2	2-3/8	3.50	6.50	8.50	1	2.656	2.32	7/8	8	Standard
2-1/2	2-7/8	3.75	7.50	9.63	1 1/8	3.156	2.81	1	8	Standard
3	3-1/2	4.00	7.50	9.50	1	3.813	3.45	7/8	8	Standard
3-1/2	4	Not Available								
4	4-1/2	4.50	9.25	11.50	1 1/4	4.813	4.42	1 1/8	8	Standard
5	5-1/2	4.50	11.00	13.75	1 3/8	5.594	5.17	1 1/4	8	Standard
6	6-5/8	4.50	12.50	15.00	1 1/4	6.719	6.29	1 1/8	12	Standard
6*, 6-L	7	5.50	12.50	15.00	1 1/4	7.094	6.60	1 1/8	12	Standard
6-L*	7-5/8	5.20	12.50	15.00	1 1/4	7.781	7.24	1 1/8	12	Standard
8	9-5/8	6.00	15.50	18.50	1 1/2	9.781	9.19	1 3/8	12	Standard
10	10-3/4	7.25	18.50	21.50	1 1/2	10.906	10.24	1 3/8	16	Standard
10-L	11-3/4	6.50	18.50	21.50	1 1/2	11.923	11.29	1 3/8	16	Standard
10-L*	11-3/4 L	7.25	18.50	21.50	1 1/2	12.640	11.96	1 3/8	16	Standard

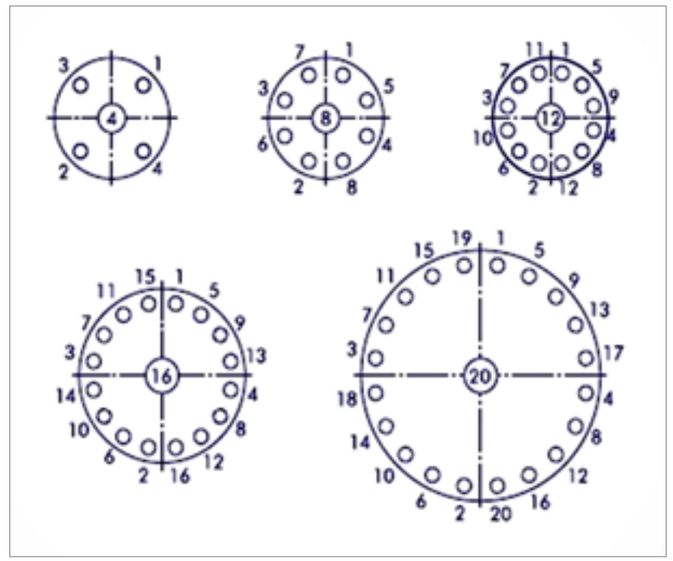
DIMENSIONS - ANSI 900 4RD Thread										
SIZE	Thread Size	A	B	C	D	E	F	BOLT SIZE	BOLT QTY	Washer OD
4	4-1/2	4.50	9.25	11.50	1 1/4	4.81	4.42	1 1/8	8	Standard
6	6-5/8	5.50	12.50	15.00	1 1/4	6.99	6.41	1 1/8	12	Standard
8	9-5/8	7.00	15.50	18.50	1 1/2	9.98	9.26	1 3/8	12	Standard
10	10-3/4	7.25	18.50	21.50	1 1/2	10.91	10.24	1 3/8	16	Standard
12	13-3/8	8.00	21.00	24.00	1 1/2	13.54	12.81	1 3/8	20	Standard

Other sizes available by request.

DIMENSIONS - ANSI 1500 8RD Thread										
SIZE	Thread Size	A	B	C	D	E	F	BOLT SIZE	BOLT QTY	Washer
2	2-3/8	3.50	6.50	8.50	1	2.656	2.32	7/8	8	Standard
2-1/2	2-7/8	3.75	7.50	9.63	1 1/8	3.156	2.81	1	8	Standard
3	3-1/2	4.00	8.00	10.50	1 1/4	3.813	3.45	1 1/8	8	Standard
3-1/2	4	Not Available								
4	4-1/2	4.50	9.50	12.25	1 3/8	4.813	4.42	1 1/4	8	Standard
5	5-1/2	4.50	11.50	14.75	1 5/8	5.594	5.17	1 1/2	8	Standard
6	6-5/8	4.50	12.50	15.50	1 1/2	6.719	6.29	1 3/8	12	Standard
6*, 6-L	7	5.50	12.50	15.50	1 1/2	7.094	6.60	1 3/8	12	Standard
6-L*	7-5/8	5.20	12.50	15.50	1 1/2	7.781	7.24	1 3/8	12	Standard
8	9-5/8	6.00	15.50	19.00	1 3/4	9.781	9.19	1 5/8	12	Standard
10	10-3/4	7.25	19.00	23.00	2	10.906	10.24	1 7/8	12	Standard
10-L	11-3/4	6.50	19.00	23.00	2	11.923	11.29	1 7/8	12	Standard
10-L*	11-3/4 L	7.25	19.00	23.00	2	12.640	11.96	1 7/8	12	Standard

DIMENSIONS - ANSI 1500 4RD Thread										
SIZE	Thread Size	A	B	C	D	E	F	BOLT SIZE	BOLT QTY	Washer OD
4	4-1/2	4.50	9.50	12.25	1 3/8	4.81	4.42	1 1/4	8	Standard
6	6-5/8	5.50	12.50	15.50	1 1/2	6.99	6.41	1 3/8	12	Standard
8	9-5/8	7.00	15.50	19.00	1 3/4	9.98	9.26	1 5/8	12	Standard
10	10-3/4	7.25	19.00	23.00	2	10.91	10.24	1 7/8	12	Standard
12	13-3/8	8.00	22.50	26.50	2 1/8	13.54	12.81	2	16	Standard

Other sizes available by request.

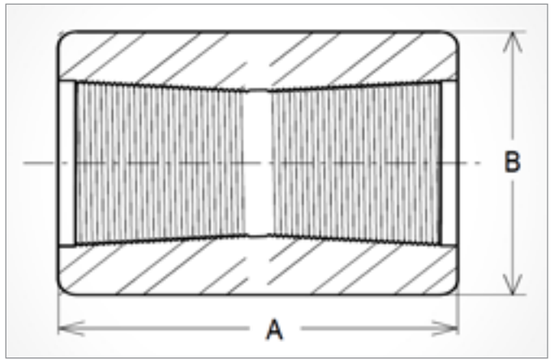


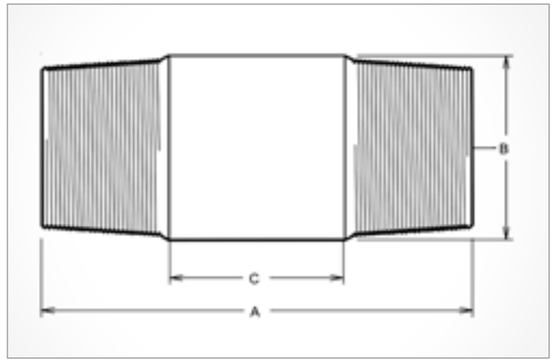
Bolt Torque sequence per ASTM D4024

Coupling

Nominal Size	Thread Size	A
2	2-3/8	6.25
2*	2-7/8	6.75
2-1/2	2-7/8	6.75
2-1/2*	3-1/2	7.25
3	3-1/2	7.25
3*	4	8.00
3-1/2	4	8.00
4	4-1/2	8.00
4*	5-1/2	8.50
5	5-1/2	8.50
6	6-5/8	9.00
6* & 6-L	7	9.00
6-L*	7-5/8	11.00
8	9-5/8	11.25
10	10-3/4	14.00
10-L	11-3/4	11.75
10-L*	11-3/4 L	14.00
12	13-3/8	13.00
12*	13-3/8 L	15.00
14-1/2	16	16.00
14-1/2*	16 L	16.00
16-1/2	18	16.00
18	20	16.00

A = Coupling Length
B = Coupling Maximum Box OD, varies depending on the pressure class
Note:
* = Upsized Thread Size





Nipple

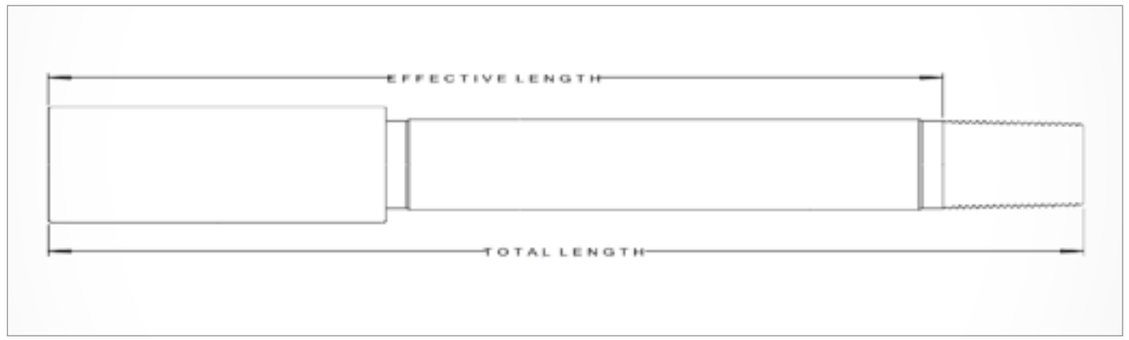
Nominal Size	Thread Size	A	B	C
2	2-3/8	11.25	2.69	5.00
2*	2-7/8	11.75	3.19	5.00
2-1/2	2-7/8	11.75	3.19	5.00
2-1/2*	3-1/2	12.25	3.85	5.00
3	3-1/2	12.25	3.85	5.00
3*	4	13.00	4.35	5.00
3-1/2	4	13.00	4.35	5.00
4	4-1/2	13.00	4.85	5.00
4*	5-1/2	13.50	5.60	5.00
5	5-1/2	13.50	5.60	5.00
6	6-5/8	16.00	6.73	7.00
6* & 6-L	7	16.00	7.10	7.00
6-L*	7-5/8	18.00	7.73	7.00
8	9-5/8	18.25	9.73	7.00
10	10-3/4	21.00	10.85	7.00
10-L	11-3/4	18.75	11.93	7.00
10-L*	11-3/4 L	21.00	12.65	7.00
12	13-3/8	20.00	13.65	7.00
12*	13-3/8 L	22.00	14.19	7.00
14-1/2	16	23.00	16.33	7.00
14-1/2*	16 L	23.00	17.09	7.00
16-1/2	18	23.00	18.84	7.00
16-1/2*	18L	23.00	19.53	7.00
18	20	23.00	20.20	7.00
18*	20L	23.00	21.13	7.00

A = Nipple Length B = Pin Upset OD
C = Spacing between the threads
Note:
* = Upsized Thread Size

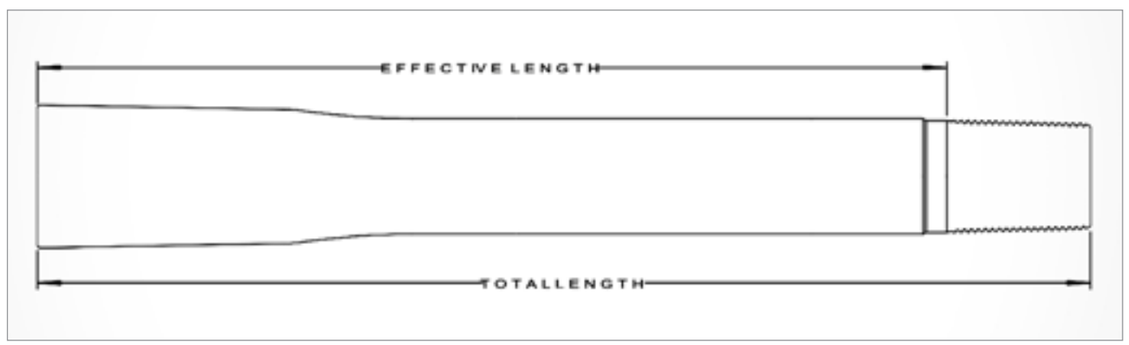
Sub Joint

1- Sub joints Pin x Pin (male x male) are available both individually and in sets.
2- Standard sub set consist of five joints 2, 4, 6, 8, and 10 feet in length.
3- Custom non-standard length subs are available upon request.
4- All sub joints are manufactured at the maximum wall thickness available for the size ordered

Pup Joint



Pup Joint with Threaded and Coupled (T&C)



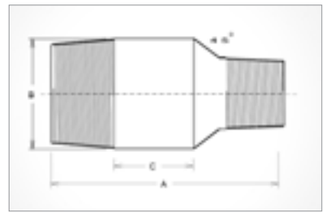
Pup Joint with Integral Joint (IJ)

1- Pup joints Pin x Box (male x female), are available both individually and in sets.
2- Standard pup set consist of five joints 2, 4, 6, 8, and 10 feet in length.
3- Custom non-standard length pups are available upon request.
4- All sub joints are manufactured at the maximum wall thickness available for the size ordered.

Crossovers

Swage

Nominal Size		Thread Size	A	B	C
Big Size	Small Size				
2-1/2	2	2-7/8 x 2-3/8	11.75	3.19	5.00
2-1/2* , 3	2	3-1/2 x 2-3/8	12.38	3.85	5.00
2-1/2* , 3	2* , 2-1/2	3-1/2 x 2-7/8	12.38	3.85	5.00
3* , 3-1/2	2* , 2-1/2	4 x 2-7/8	13.00	4.35	5.00
3* , 3-1/2	2-1/2* , 3	4 x 3-1/2	12.88	4.35	5.00
3-1/2* , 4	2-1/2* , 3	4-1/2 x 3-1/2	13.13	4.85	5.00
4	3* , 3-1/2	4-1/2 x 4	13.25	4.85	5.00
4* , 5	3* , 3-1/2	5-1/2 x 4	13.88	5.60	5.00
4* , 5	4	5-1/2 x 4-1/2	13.63	5.60	5.00
6	3-1/2* , 4	6-5/8 x 4-1/2	16.50	6.73	7.00
6	4* , 5	6-5/8 x 5-1/2	16.38	6.73	7.00
6*, 6-L	4	7 x 4-1/2	16.50	7.10	7.00
6* , 6-L	4* , 5	7 x 5-1/2	16.25	7.10	7.00
6-L*	6	7-5/8 x 6-5/8	16.63	7.73	7.00
6-L*	6*, 6-L	7-5/8 x 7	16.50	7.73	7.00
8	6*, 6-L	9-5/8 x 7	18.50	9.73	7.00
8	6-L*	9-5/8 x 7-5/8	18.25	9.73	7.00
10	6-L*	10-3/4 x 7-5/8	19.00	10.85	7.00
10	8	10-3/4 x 9-5/8	19.00	10.85	7.00
10-L	8	11-3/4 x 9-5/8	19.63	11.93	7.00
10-L	10	11-3/4 x 10-3/4	19.25	11.93	7.00
10-L*	8	11-3/4 L x 9-5/8	21.13	12.65	7.00
10-L*	10	11-3/4 L x 10-3/4	20.75	12.65	7.00
12	10	13-3/8 x 10-3/4	20.75	13.65	7.00
12	10-L	13-3/8 x 11-3/4	20.25	13.65	7.00
12	10-L*	13-3/8 x 11-3/4 L	21.13	13.65	7.00
12*	10	13-3/8 L x 10-3/4	22.00	14.19	7.00
12*	10-L	13-3/8 L x 11-3/4	21.63	14.19	7.00
12*	10-L*	13-3/8 L x 11-3/4 L	22.38	14.19	7.00
14-1/2	12	16 x 13-3/8	22.88	16.33	7.00
14-1/2	12*	16 x 13-3/8 L	23.63	16.33	7.00
14-1/2*	12	16 L x 13-3/8	23.25	17.09	7.00
14-1/2*	12*	16 L x 13-3/8 L	24.38	17.90	7.00
16	14-1/2	18 x 16	24.38	18.84	7.00
16	14-1/2*	18 x 16 L	23.88	18.84	7.00
16*	14-1/2	18 L x 16	24.63	19.53	7.00
16*	14-1/2*	18 L x 16 L	24.25	19.53	7.00
18	16	20 x 18	23.75	20.20	7.00
18*	16	20 L x 18	24.25	21.13	7.00

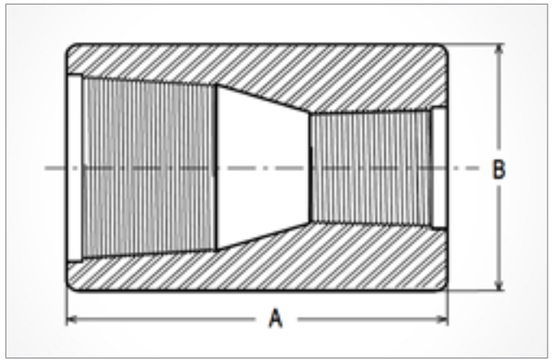


Note:
* = Upsized Thread Size

A = Swage Length
B = Pin Upset OD

Reducer Coupler

Nominal Size		Thread Size	A
Big Size	Small Size		
2-1/2	2	2-7/8 x 2-3/8	7.13
2-1/2* , 3	2	3-1/2 x 2-3/8	8.13
2-1/2* , 3	2* , 2-1/2	3-1/2 x 2-7/8	7.88
3* , 3-1/2	2* , 2-1/2	4 x 2-7/8	8.88
3* , 3-1/2	2-1/2* , 3	4 x 3-1/2	8.25
3-1/2* , 4	2-1/2* , 3	4-1/2 x 3-1/2	8.88
4	3* , 3-1/2	4-1/2 x 4	8.63
4* , 5	3* , 3-1/2	5-1/2 x 4	9.88
4* , 5	4	5-1/2 x 4-1/2	9.25
6	3-1/2* , 4	6-5/8 x 4-1/2	10.88
6	4* , 5	6-5/8 x 5-1/2	10.13
6*, 6-L	4	7 x 4-1/2	11.50
6* , 6-L	4* , 5	7 x 5-1/2	10.88
6-L*	6	7-5/8 x 6-5/8	10.38
6-L*	6*, 6-L	7-5/8 x 7	10.00
8	6*, 6-L	9-5/8 x 7	13.38
8	6-L*	9-5/8 x 7-5/8	12.75
10	6-L*	10-3/4 x 7-5/8	14.25
10	8	10-3/4 x 9-5/8	12.75
10-L	8	11-3/4 x 9-5/8	14.25
10-L	10	11-3/4 x 10-3/4	13.00
10-L*	8	11-3/4 L x 9-5/8	16.25
10-L*	10	11-3/4 L x 10-3/4	15.00
12	10	13-3/8 x 10-3/4	15.75
12	10-L	13-3/8 x 11-3/4	14.50
12	10-L*	13-3/8 x 11-3/4 L	14.75
12*	10	13-3/8 L x 10-3/4	17.38
12*	10-L	13-3/8 L x 11-3/4	16.13
12*	10-L*	13-3/8 L x 11-3/4 L	16.38
14-1/2	12	16 x 13-3/8	17.75
14-1/2	12*	16 x 13-3/8 L	18.13
14-1/2*	12	16 L x 13-3/8	18.75
14-1/2*	12*	16 L x 13-3/8 L	20.00
16	14-1/2	18 x 16	19.13
16	14-1/2*	18 x 16 L	18.13
16*	14-1/2	18 L x 16	19.88
16*	14-1/2*	18 L x 16 L	19.00
18	16	20 x 18	17.75
18*	16	20 L x 18	18.88

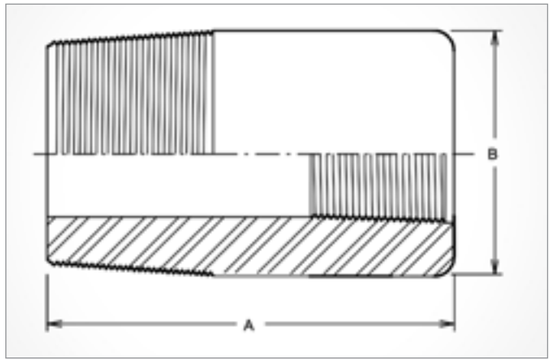


Note:
* = Upsized Thread Size

A = Reducer Coupling Length
B = Reducer Coupling Maximum Box OD, varies depending on the pressure class

Reducer Bushing

Nominal Size		Thread Size	A
Big Size	Small Size		
2-1/2	2	2-7/8 x 2-3/8	11.50
2-1/2* , 3	2	3-1/2 x 2-3/8	11.75
2-1/2* , 3	2* , 2-1/2	3-1/2 x 2-7/8	12.00
3* , 3-1/2	2* , 2-1/2	4 x 2-7/8	12.38
3* , 3-1/2	2-1/2* , 3	4 x 3-1/2	12.63
3-1/2* , 4	2-1/2* , 3	4-1/2 x 3-1/2	12.63
4	3* , 3-1/2	4-1/2 x 4	13.00
4* , 5	3* , 3-1/2	5-1/2 x 4	15.25
4* , 5	4	5-1/2 x 4-1/2	15.25
6	3-1/2* , 4	6-5/8 x 4-1/2	15.50
6	4* , 5	6-5/8 x 5-1/2	15.75
6*, 6-L	4	7 x 4-1/2	15.50
6* , 6-L	4* , 5	7 x 5-1/2	15.75
6-L*	6	7-5/8 x 6-5/8	16.13
6-L*	6*, 6-L	7-5/8 x 7	16.13
8	6*, 6-L	9-5/8 x 7	17.13
8	6-L*	9-5/8 x 7-5/8	17.25
10	6-L*	10-3/4 x 7-5/8	17.38
10	8	10-3/4 x 9-5/8	18.38
10-L	8	11-3/4 x 9-5/8	18.50
10-L	10	11-3/4 x 10-3/4	18.63
10-L*	8	11-3/4 L x 9-5/8	19.63
10-L*	10	11-3/4 L x 10-3/4	19.75
12	10	13-3/8 x 10-3/4	19.25
12	10-L	13-3/8 x 11-3/4	19.38
12	10-L*	13-3/8 x 11-3/4 L	20.50
12*	10	13-3/8 L x 10-3/4	20.25
12*	10-L	13-3/8 L x 11-3/4	20.38
12*	10-L*	13-3/8 L x 11-3/4 L	21.50
14-1/2	12	16 x 13-3/8	21.50
14-1/2	12*	16 x 13-3/8 L	22.50
14-1/2*	12	16 L x 13-3/8	21.50
14-1/2*	12*	16 L x 13-3/8 L	22.50
16	14-1/2	18 x 16	23.00
16	14-1/2*	18 x 16 L	23.00
16*	14-1/2	18 L x 16	23.00
16*	14-1/2*	18 L x 16 L	23.00
18	16	20 x 18	23.00
18*	16	20 L x 18	23.00



Note:
* = Upsized Thread Size

A = Reducer Bushing Length
B = Reducer Bushing OD, varies depending on the pressure class

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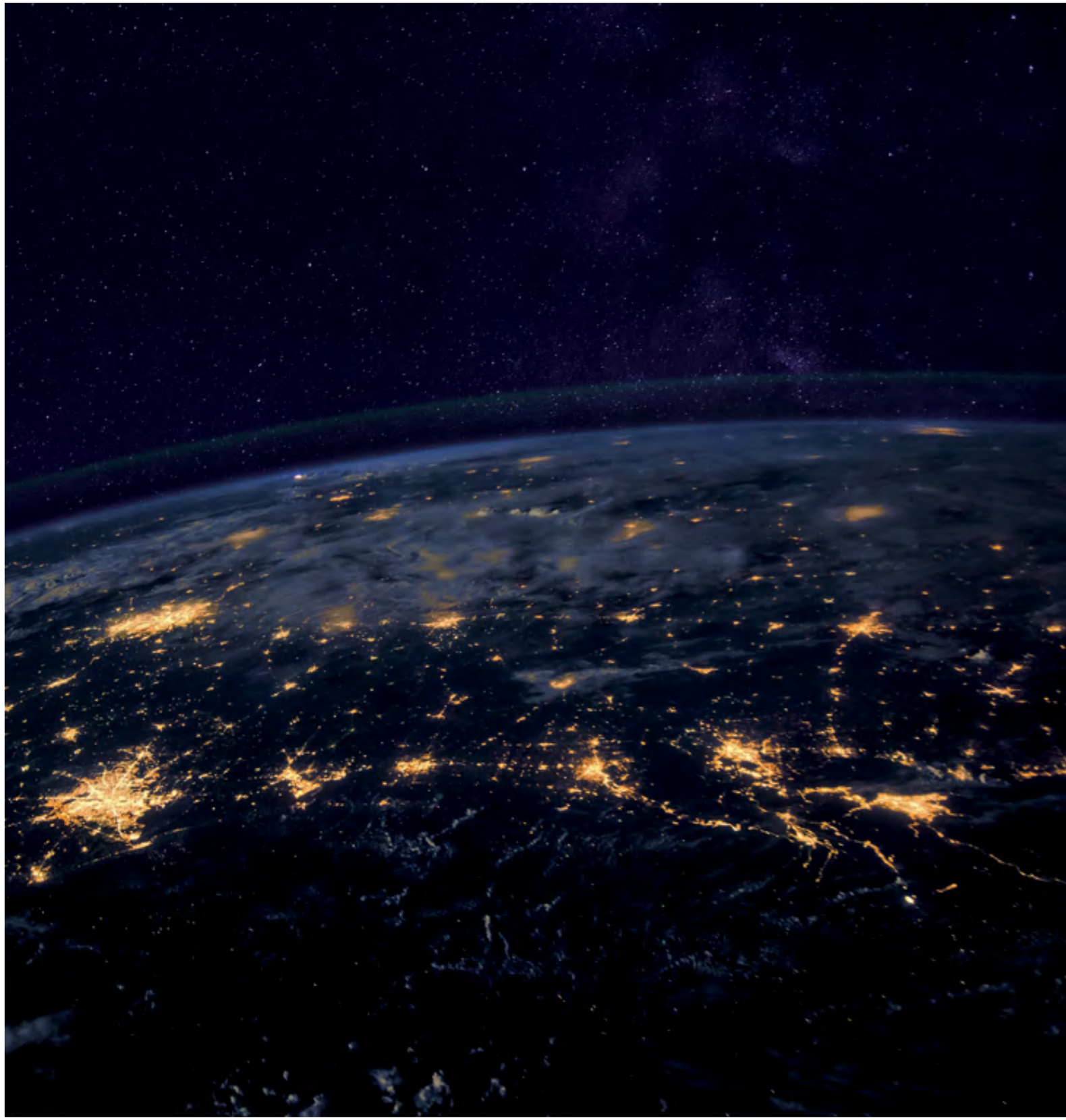

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