On the Leading Edge:Nippon Steel

NIPPON STEEL

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T.U.F.-PIPE for OCTG
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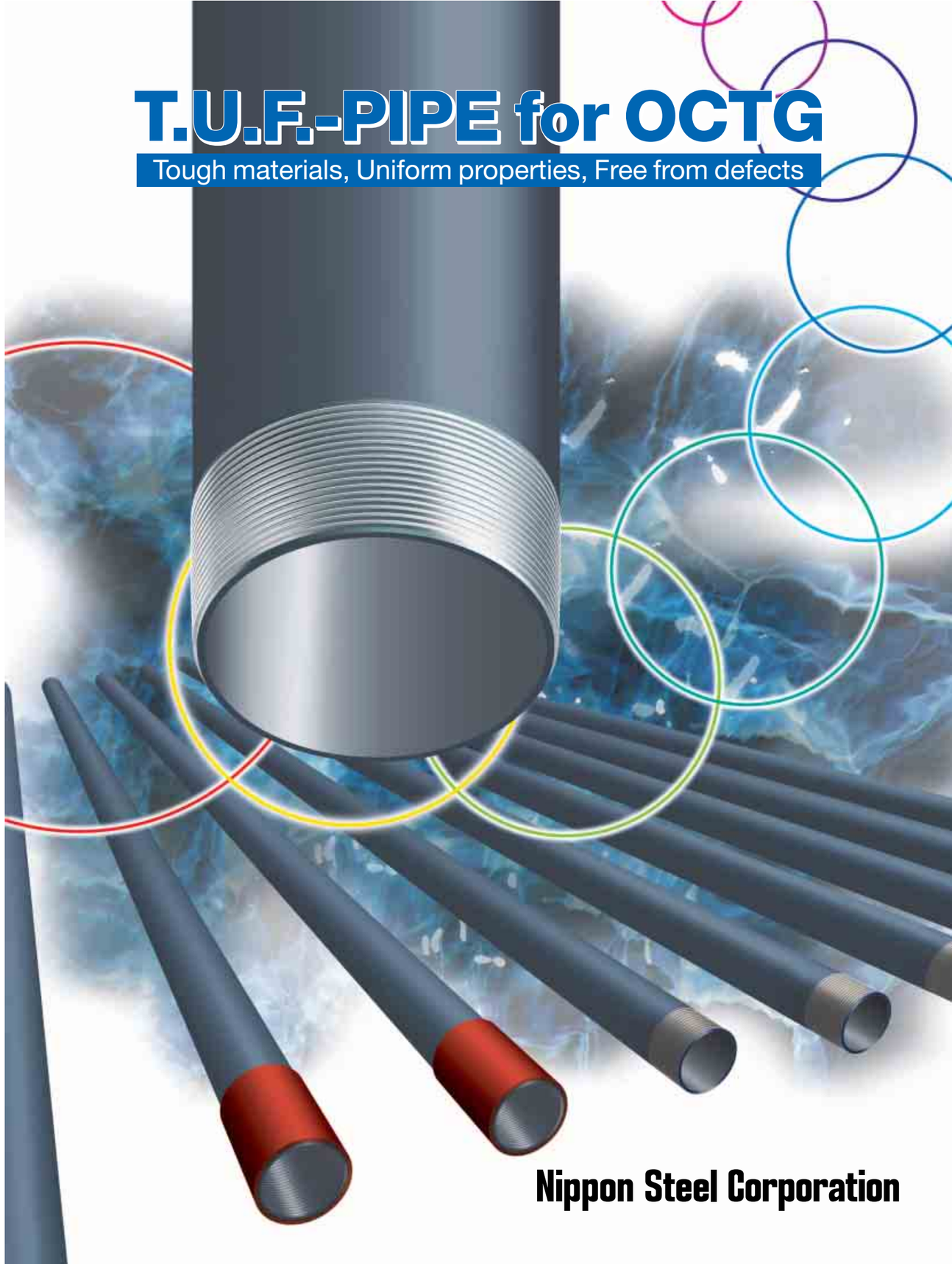
T.U.F.-PIPE for OCTG

Tough materials, Uniform properties, Free from defects



Nippon Steel Corporation

T.U.F.-PIPE for OCTG

Tough materials, Uniform properties, Free from defects

Nippon Steel Corporation, the world's largest steelmaker, supplies a full range of pipe and tubes — 1.5 million ton a year. Oil companies and other energy-related firms around the world have come to regard Nippon Steel as the standard of quality for these products.

Quality has improved over the years to the extent that defect-free weld metal, which are tough as base metal, are consistently achieved, making Nippon Steel's ERW pipe ideal for OCTG applications. In fact, it is so superior to conventional ERW pipe that a new name is needed. This catalog will show why this new pipe, T.U.F.-PIPE, can satisfy all your requirements for quality, quantity and delivery.

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Characteristics

1 Superior Material

Nippon Steel production system begins with advanced metallurgy and clean BOF steelmaking practices. Continuous casting followed by hot-rolling, produces hot-rolled strip of optimum quality for pipe making.

2 High Dimensional Accuracy

High uniform wall thickness and smooth finish free from nonmetallic inclusions and surface defects provide casing and tubing with a superior level of quality and excellent driftability as well as high performance properties.

3 Tough Weld

Weld metal free from defects and as tough as the base metal result from Nippon Steel's newly-developed technology.

4 High Performance Properties

Nippon Steel's proprietary standard "NT-Series" have higher performance ratings than corresponding API grades.

5 Wide Range of Availability

T.U.F.-Pipe is available in outside diameter from 4.5 in to 20 inch, wall thickness up to 0.750 in and length up to 65 feet.

Available Grades

	Yield Strength Min. (psi)	API 5CT	NT-Series (Nippon Steel Standards)			
			Deep Well Service **DE**	High Collapse Resistance Casing		High Toughness (Arctic Service) **LE**
				General **HE**	High Toughness **LHE**	
OCTG	40,000	H-40				
	55,000	J-55		NT-55HE	NT-55LHE	NT-55LE
		K-55				
	80,000		NT-80DE	NT-80HE	NT-80LHE	NT-80LE
	95,000			NT-95HE		

Line Pipe	Grade
	API 5LA～X80

Guaranteed Properties

		High Collapse Strength	Sour Resistance		Low Hardness	Charpy Value		Dimensions	
			Shell Bend	COR-Test		Longitudinal	Transverse	Alternative Drift	Internal Yield Pressure
API		As per API 5CT							
NT-Series	**DE**	—	—	—	—	—	—	○	○*
	HE	○	—	—	○	—	—	○	○*
	LHE	○	—	—	○	○	—	○	○*
	LE	—	—	—	○	—	○	○	○*

*Internal Yield Pressure of Pipe $P=0.925\frac{(2Ypt)}{(D)}$

(Wall Thickness Tolerance: −7.5%)

Mechanical Properties

(1) Tensile Properties and Hardness

Grade			Yield Strength (psi)		Tensile Strength (psi)	Elongation (%)	Hardness (HRC)
			Min.	Max.	Min.		
API 5CT		H-40	40,000	80,000	60,000	API-formula	—
		J-55	55,000	80,000	75,000		—
		K-55	55,000	80,000	95,000		—
NT-Series	Deep Well Service **DE**	NT-80DE	80,000	110,000	100,000		—
	High Collapse -General **HE**	NT-55HE	55,000	95,000	95,000		≦22
		NT-80HE	80,000	110,000	100,000		≦22
		NT-95HE	95,000	125,000	110,000		≦31
	High Collapse -High Toughness **LHE**	NT-55LHE	55,000	80,000	75,000		≦20
		NT-80LHE	80,000	95,000	95,000		≦22
	Arctic Service **LE**	NT-55LE	55,000	80,000	75,000		≦20
		NT-80LE	80,000	95,000	95,000		≦22

(2) Toughness

Grade		Direction	Test Temp.	Charpy Absorbed Energy (ft-1b)*			
				Base Metal		Weld	
				Ave.	Min.	Ave.	Min.
High Collapse -High Toughness **LHE**	NT-55LHE	L	−50˚F	25.0 ft-lb	20.0 ft-lb	25.0 ft-lb	20.0 ft-lb
	NT-80LHE	L	−50˚F	25.0 ft-lb	20.0 ft-lb	25.0 ft-lb	20.0 ft-lb
Arctic Service **LE**	NT-55LE	C	−50˚F	25.0 ft-lb	20.0 ft-lb	25.0 ft-lb	20.0 ft-lb
	NT-80LE	C	−50˚F	25.0 ft-lb	20.0 ft-lb	25.0 ft-lb	20.0 ft-lb

*In case of full size specimen

Available Sizes

(1) Casing

○: Available —: Not Available (○): Non-API Size

Outside Diameter in (mm)	Nominal Weight Thread & Coupling	Wall Thickness		Grade											Thread Type			
				API 5CT			NT-Series				NT-Series				Round		BTC	
							DE	HE			LHE		LE					
	lbs/ft	in	mm	H-40	J-55	K-55	NT-80DE	NT-55HE	NT-80HE	NT-95HE	NT-55LHE	NT-80LHE	NT-55LE	NT-80LE	Short	Long	for API Grade	for NT-Series
4½ (114.3)	9.50	**0.205**	5.21	○	○	○	○	○	○	—	○	○	○	○	○	—	—	(○)
	10.50	**0.224**	5.69	(○)	○	○	○	○	○	—	○	○	○	○	○	—	○	○
	11.60	**0.250**	6.35	(○)	○	○	○	○	○	—	○	○	—	○	○	○	○	○
	13.50	**0.290**	7.37	(○)	(○)	(○)	○	○	○	—	○	○	—	○	—	○	○	○
	15.10	**0.337**	8.56	(○)	(○)	(—)	○	○	○	—	○	○	—	○	—	○	○	○
5 (127.0)	11.50	**0.220**	5.59	(○)	○	○	○	○	○	—	○	○	○	○	○	—	—	(○)
	13.00	**0.253**	6.43	(○)	○	○	○	○	○	—	○	○	○	○	○	○	○	○
	15.00	**0.296**	7.52	(○)	○	○	○	○	○	—	○	○	—	○	○	○	○	○
	18.00	**0.362**	9.19	(○)	(○)	(○)	○	○	○	—	○	○	—	○	—	○	○	○
	21.40	**0.437**	11.10	(○)	(○)	(—)	○	○	○	—	○	○	—	○	—	○	○	○
	23.20	**0.478**	12.14	(○)	(○)	(—)	○	○	○	—	○	○	—	○	—	○	○	○
5½ (139.7)	14.00	**0.244**	6.20	○	○	○	○	○	○	○	○	○	○	○	○	—	—	(○)
	15.50	**0.275**	6.98	(○)	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	17.00	**0.304**	7.72	(○)	○	○	○	○	○	○	○	○	—	○	○	○	○	○
	20.00	**0.361**	9.17	(○)	(○)	(○)	○	○	○	—	○	○	—	○	—	○	○	○
	23.00	**0.415**	10.54	(○)	(○)	(○)	○	○	○	—	○	○	—	○	—	○	○	○
6⅝ (168.3)	20.00	**0.288**	7.32	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	24.00	**0.352**	8.94	(○)	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	28.00	**0.417**	10.59	(○)	(○)	(○)	○	○	○	—	○	○	—	○	—	○	○	○
	32.00	**0.475**	12.06	(○)	(○)	(○)	○	○	○	—	○	○	—	○	—	○	○	○
7 (177.8)	17.00	**0.231**	5.87	○	(○)	(○)	○	○	○	○	○	○	○	○	○	—	—	(○)
	20.00	**0.272**	6.91	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	23.00	**0.317**	8.05	(○)	○	○	○	○	○	○	○	○	—	○	○	○	○	○
	26.00	**0.362**	9.19	(○)	○	○	○	○	○	○	○	○	—	○	—	○	○	○
	29.00	**0.408**	10.36	(○)	(○)	(○)	○	○	○	—	○	○	—	○	—	○	○	○
	32.00	**0.453**	11.51	(○)	(○)	(○)	○	○	○	—	○	○	—	○	—	○	○	○
	35.00	**0.498**	12.65	(○)	(○)	(○)	○	○	○	—	○	—	—	○	—	○	○	○
7⅝ (193.7)	24.00	**0.300**	7.62	○	(○)	(○)	○	○	○	○	○	○	○	○	○	—	—	(○)
	26.40	**0.328**	8.33	(○)	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	29.70	**0.375**	9.52	(○)	(○)	(○)	○	○	○	○	○	○	○	○	—	○	○	○
	33.70	**0.430**	10.92	(○)	(○)	(○)	○	○	○	—	○	○	—	○	—	○	○	○
	39.00	**0.500**	12.70	(○)	(○)	(○)	○	○	○	—	○	—	—	○	—	○	○	○
8⅝ (219.1)	24.00	**0.264**	6.71	(○)	○	○	○	○	○	○	○	○	○	○	○	—	—	(○)
	28.00	**0.304**	7.72	○	(○)	(○)	○	○	○	○	○	○	○	○	○	—	—	(○)
	32.00	**0.352**	8.94	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	36.00	**0.400**	10.16	(○)	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	40.00	**0.450**	11.43	(○)	(○)	(○)	○	○	○	○	○	○	—	○	—	○	○	○
	44.00	**0.500**	12.70	(○)	(○)	(○)	○	○	○	—	○	○	—	○	—	○	○	○
	49.00	**0.557**	14.15	(○)	(○)	(○)	○	○	○	—	○	○	—	○	—	○	○	○
9⅝ (244.5)	32.30	**0.312**	7.92	○	(○)	(○)	○	○	○	○	○	○	○	○	○	—	—	(○)
	36.00	**0.352**	8.94	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	40.00	**0.395**	10.03	(○)	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	43.50	**0.435**	11.05	(○)	(○)	(○)	○	○	○	○	○	○	○	○	—	○	○	○
	47.00	**0.472**	11.99	(○)	(○)	(○)	○	○	○	○	○	○	○	○	—	○	○	○
	53.50	**0.545**	13.84	(○)	(○)	(○)	○	○	○	○	○	○	—	○	—	○	○	○
10¾ (273.1)	32.75	**0.279**	7.09	○	(○)	(○)	○	○	○	○	○	○	○	○	○	—	—	(○)
	40.50	**0.350**	8.89	○	○	○	○	○	○	○	○	○	○	○	○	(○)	○	○
	45.50	**0.400**	10.16	(○)	○	○	○	○	○	○	○	○	○	○	○	(○)	○	○
	51.00	**0.450**	11.43	(○)	○	○	○	○	○	○	○	○	○	○	○	(○)	○	○
	55.50	**0.495**	12.57	(○)	(○)	(○)	○	○	○	○	○	○	○	○	○	(○)	○	○
	60.70	**0.545**	13.84	(○)	(○)	(○)	○	○	○	○	○	○	—	○	○	(○)	○	○
	65.70	**0.595**	15.11	(○)	(○)	(○)	○	○	○	—	○	○	—	○	○	(○)	○	○

Available Sizes

(1) Casing

○: Available —: Not Available (○): Non-API Size

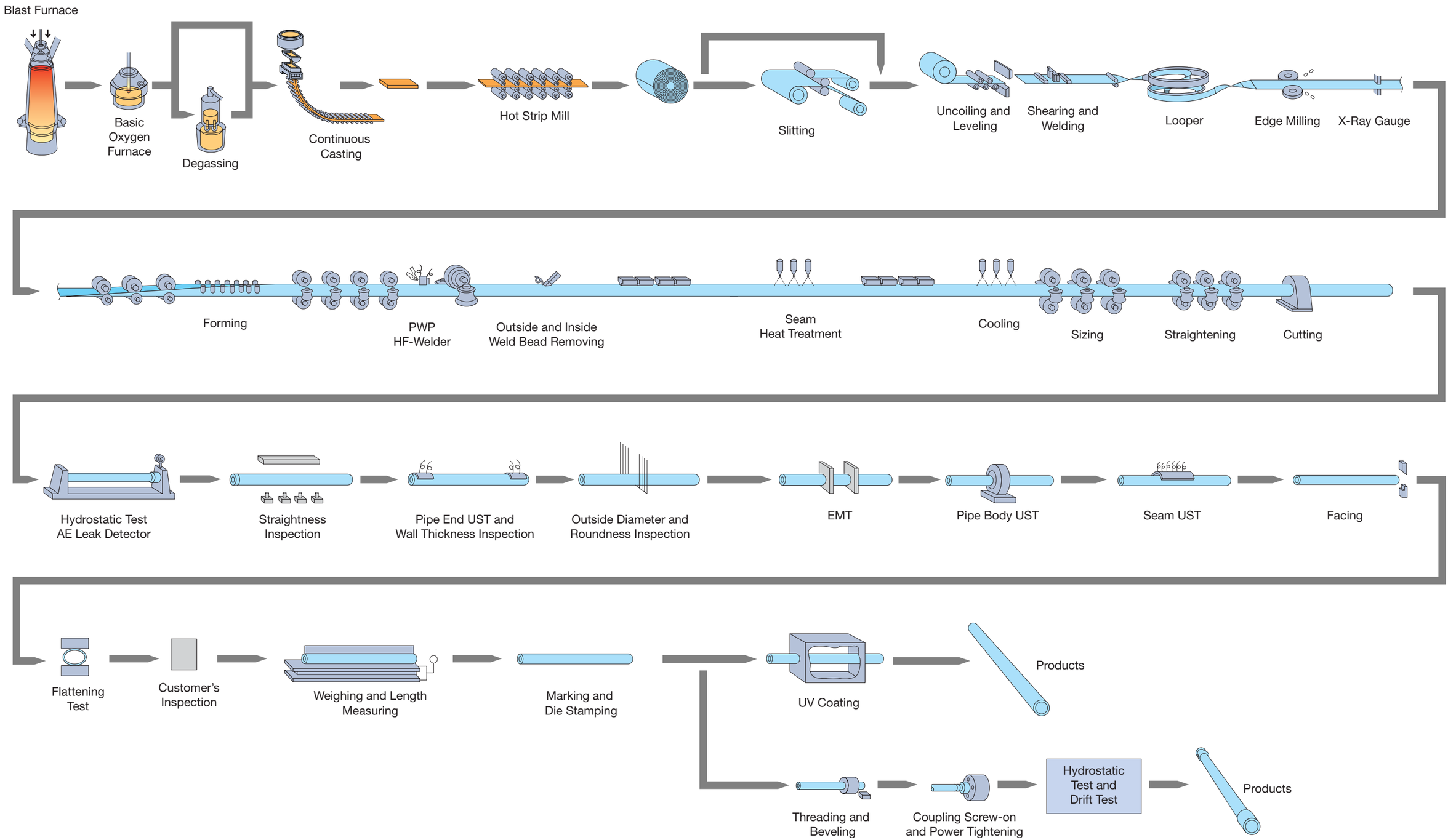
Outside Diameter in (mm)	Nominal Weight Thread & Coupling	Wall Thickness		Grade											Thread Type			
				API 5CT			NT-Series				NT-Series				Round		BTC	
							DE	HE			LHE		LE					
	lbs/ft	in	mm	H-40	J-55	K-55	NT-80DE	NT-55HE	NT-80HE	NT-95HE	NT-55LHE	NT-80LHE	NT-55LE	NT-80LE	Short	Long	for API Grade	for NT-Series
11¾ (298.5)	42.00	**0.333**	8.46	○	(○)	(○)	○	○	○	○	○	○	○	○	○	–	–	(○)
	47.00	**0.375**	9.52	(○)	○	○	○	○	○	○	○	○	○	○	○	(○)	○	○
	54.00	**0.435**	11.05	(○)	○	○	○	○	○	○	○	○	○	○	○	(○)	○	○
	60.00	**0.489**	12.42	(○)	○	○	○	○	○	○	○	○	○	○	○	(○)	○	○
13⅜ (339.7)	48.00	**0.330**	8.38	○	(○)	(○)	○	○	○	○	○	○	○	○	○	–	–	(○)
	54.50	**0.380**	9.65	(○)	○	○	○	○	○	○	○	○	○	○	○	(○)	○	○
	61.00	**0.430**	10.92	(○)	○	○	○	○	○	○	○	○	○	○	○	(○)	○	○
	68.00	**0.480**	12.19	(○)	○	○	○	○	○	○	○	○	○	○	○	(○)	○	○
	72.00	**0.514**	13.06	(○)	(○)	(○)	○	○	○	○	○	○	○	○	○	(○)	○	○
16 (406.4)	65.00	**0.375**	9.52	○	(○)	(○)	○	–	–	–	–	–	○	–	○	–	–	–
	75.00	**0.438**	11.13	(○)	○	○	○	–	–	–	–	–	○	–	○	–	○	○
	84.00	**0.495**	12.57	(○)	○	○	○	–	–	–	–	–	○	–	○	–	○	○
	94.50	**0.562**	14.27	(○)	(○)	(○)	○	–	–	–	–	–	○	–	(○)	–	(○)	(○)
	109.00	**0.656**	16.66	(○)	(○)	(○)	–	–	–	–	–	–	–	–	(○)	–	(○)	(○)
18⅝ (473.1)	78.00	**0.385**	9.78	(○)	(○)	(○)	○	–	–	–	–	–	○	–	–	–	–	–
	87.50	**0.435**	11.05	○	○	○	○	–	–	–	–	–	○	–	○	–	○	(○)
	94.50	**0.468**	11.89	(○)	(○)	(○)	○	–	–	–	–	–	○	–	(○)	–	(○)	(○)
	96.50	**0.486**	12.34	(○)	(○)	(○)	○	–	–	–	–	–	○	–	(○)	–	(○)	(○)
	106.00	**0.531**	13.49	(○)	(○)	(○)	○	–	–	–	–	–	○	–	(○)	–	(○)	(○)
	109.35	**0.563**	14.30	(○)	(○)	(○)	–	–	–	–	–	–	○	–	(○)	–	(○)	(○)
	112.00	**0.579**	14.71	(○)	(○)	(○)	–	–	–	–	–	–	○	–	(○)	–	(○)	(○)
	115.00	**0.594**	15.09	(○)	(○)	(○)	–	–	–	–	–	–	○	–	(○)	–	(○)	(○)
	122.00	**0.636**	16.15	(○)	(○)	(○)	–	–	–	–	–	–	○	–	(○)	–	(○)	(○)
20 (508.0)	94.00	**0.438**	11.13	○	○	○	○	–	–	–	–	–	○	–	○	○	○	○
	106.50	**0.500**	12.70	(○)	○	○	○	–	–	–	–	–	○	–	○	○	○	○
	117.00	**0.563**	14.30	(○)	(○)	(○)	–	–	–	–	–	–	○	–	(○)	(○)	(○)	(○)
	133.00	**0.635**	16.13	(○)	○	○	–	–	–	–	–	–	○	–	○	○	○	○

(2) 18, 18⅝, 20 and 24 in O. D. Casing with Threaded Connector

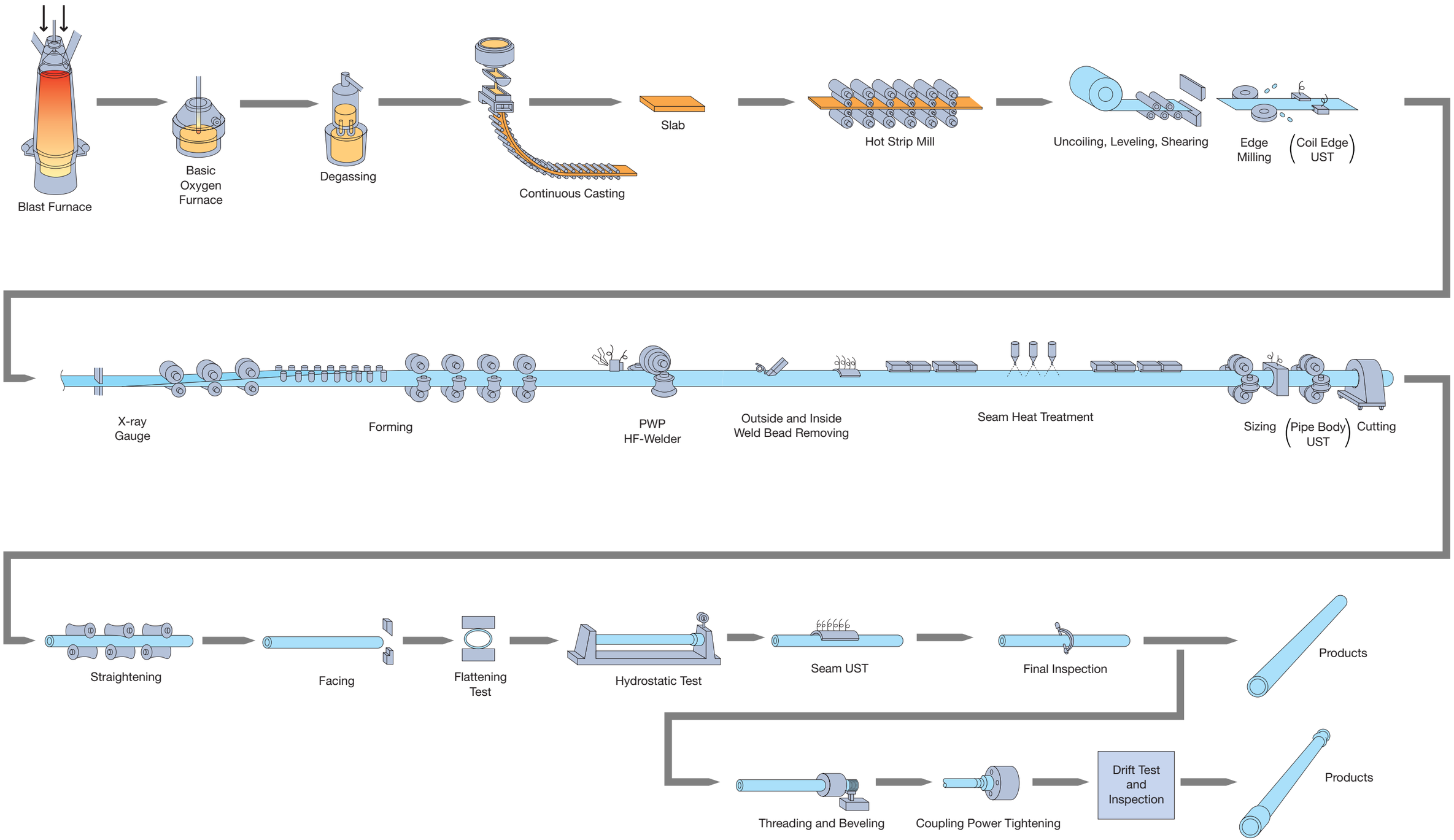
Outside Diameter	Wall Thickness		Calculated Weight
in (mm)	in	mm	lb/ft
18 (457.2)	**0.438**	11.13	82.15
18⅝ (473.1)	**0.435**	11.05	84.51
20 (508.0)	**0.438**	11.13	91.51
	0.500	12.70	104.13
	0.625	15.88	129.33
	0.635	16.13	131.33
24 (609.6)	**0.438**	11.13	110.22
	0.469	11.91	117.86
	0.500	12.70	125.49
	0.562	14.27	140.68

※ All types of connectors can be welded on, such as:
Vetco
Dril-Quip
Hunting

16-inch Mill Manufacturing Process



24-inch Mill Manufacturing Process



Principal Processes

❶ Steelmaking
Degassing and desulfurizing of the metal during the steelmaking process produce clean steel with low non-metalic inclusions and better surface finishes.

❷ Hot Rolling
Advanced hot rolling results in hot coil with a fine grain structure and high dimensional accuracy.

❸ Spiral Looper
The spiral looper supplies a steady feed of coil downstream to the continuous edge milling, pipe forming and welding stands.

❹ Forming Stands
Heavy duty stands accurately form the incoming coil into pipe having a wide range of wall thickness and outside diameters.

❺ PWP HF-Welder
The Perfect Welding Process, developed by Nippon Steel, produces high quality welds. Seams are inspected by ultrasonic testing.

❻ Welded Seam Heat Treatment
Heat treatment in the welded zone stabilizes the microstructure and gives it the same physical properties as the base metal. The exact seam position is determined by optical sensors for seam heat treatment, and ultrasonic and hydrostatic testing.

❼ Non-destructive Testing
Every length and all surfaces of each T.U.F.-Pipe is subjected to a full line-up of non-destructive tests.

❽ Automatic Inspection
Every pipe is given a comprehensive check using automatic inspection equipment.

❾ Monitoring and Tracking System
T.U.F.-Pipe is monitored and tracked at every stage of production by on-line computers. All manufacturing data is stored by computer and can be made available in any form required by the customer.

❿ Marking
Automatic stencilling and die-stamping machines identify and clearly mark every pipe.

⓫ Thread Cutting
Advanced NC lathes cut high precision threads to order. Connectors for large O.D. casings are also available. The use of thread protectors is recommended to prevent damage to the connectors during handling, loading and pipe rolling.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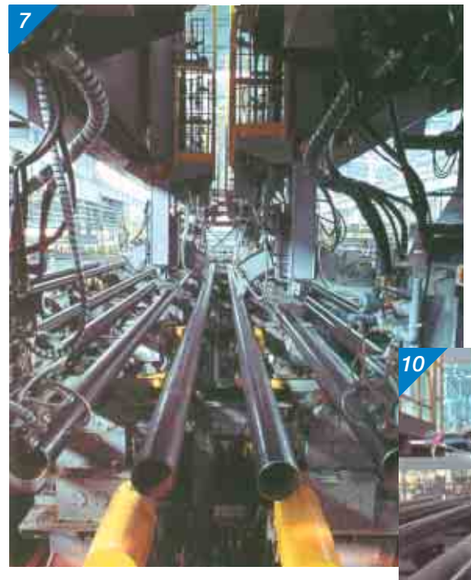
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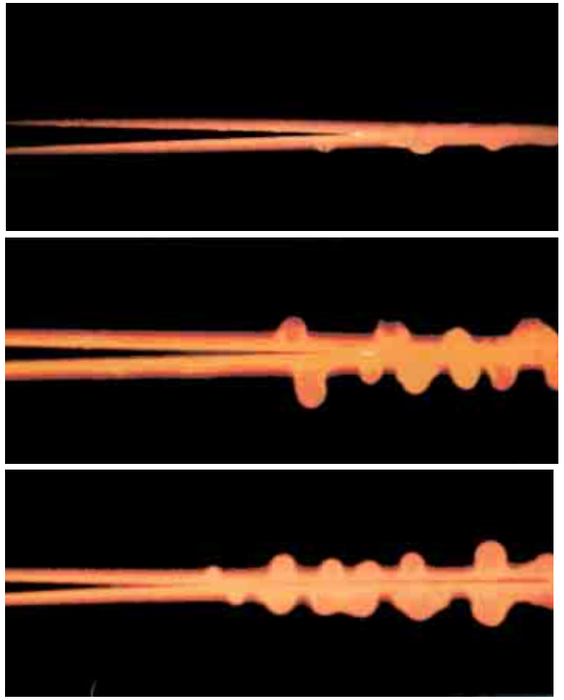
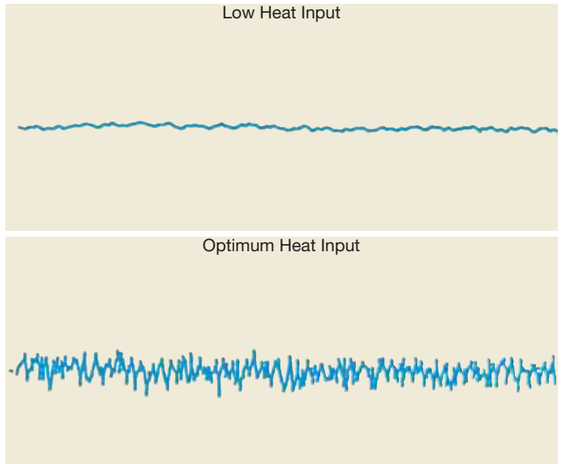
Welding Condition Monitoring and Controlling System

1. Welding conditions are not always the same
Varying combinations of welding heat input, welding speed, pipe wall thickness and the like produce different weld results.



Classification of Welding Phenomena

2. Optimum welding conditions form a narrow range.
Low heat input causes undesirable cold welds. High heat input leads to so-called penetrators. A sound weld thus requires control of heat input within a relatively narrow range.



Fluctuation Patterns of Oscillation

3. The System monitors and controls welding conditions at every instant.
With this system, welding conditions are controlled within the optimun range and the operator is clearly aware of state of welding.

Inspection

The three combined Non-destructive Inspection System, Automatic Measuring and Inspection System, and On-line Monitoring and Tracking System together represent a thorough battery of tests that will satisfy every customer's requirements. Each pipe undergoes this examination.

1. Non-destructive Inspection System
The NDI checks not only the whole pipe body, but also the weld seam and pipe-ends.

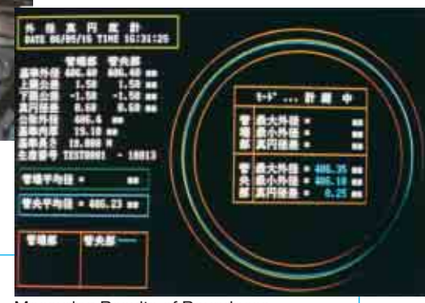
2. Automatic Measuring and Inspection System
The outside diameter, roundness and straightness, as well as the length, weight and wall thickness of every pipe are checked and recorded automtically.

3. On-line Monitoring and Tracking System
An on-line computer monitors and tracks each pipe at every step of the pipe-making process. This inspection data is collected and stored to assure the quality of each product.

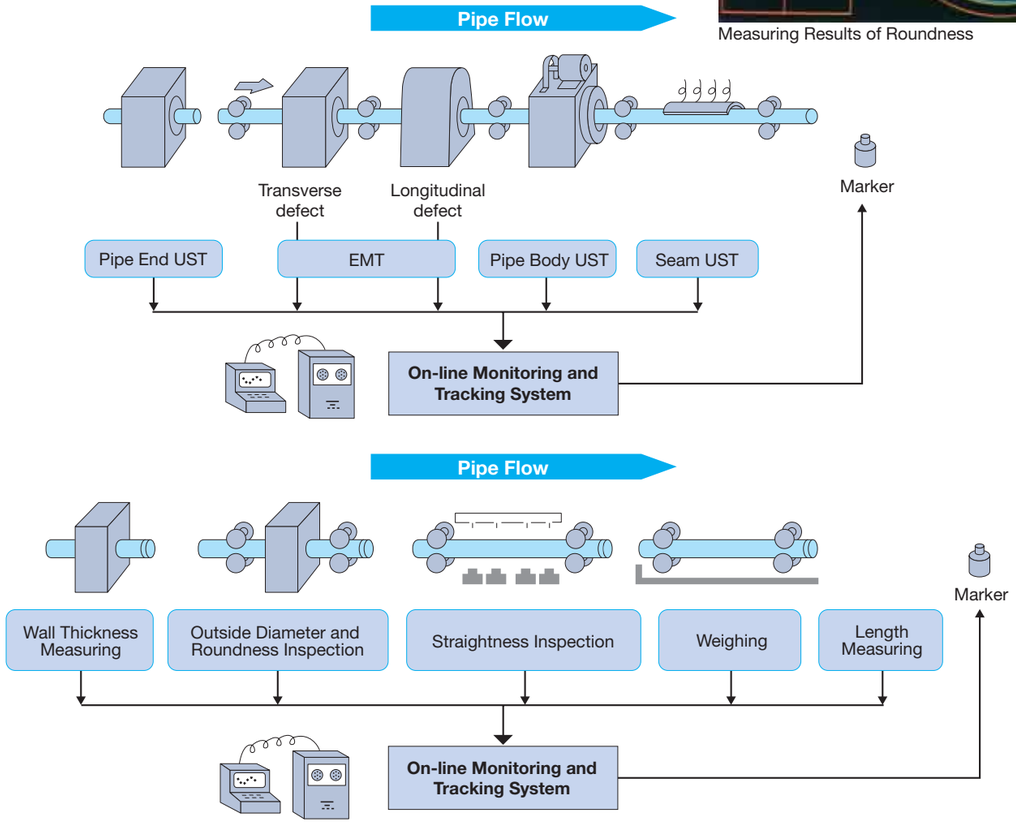
Pipe End UST

CRT displays results of pipe NDI

OD and Roundness Inspection Machine



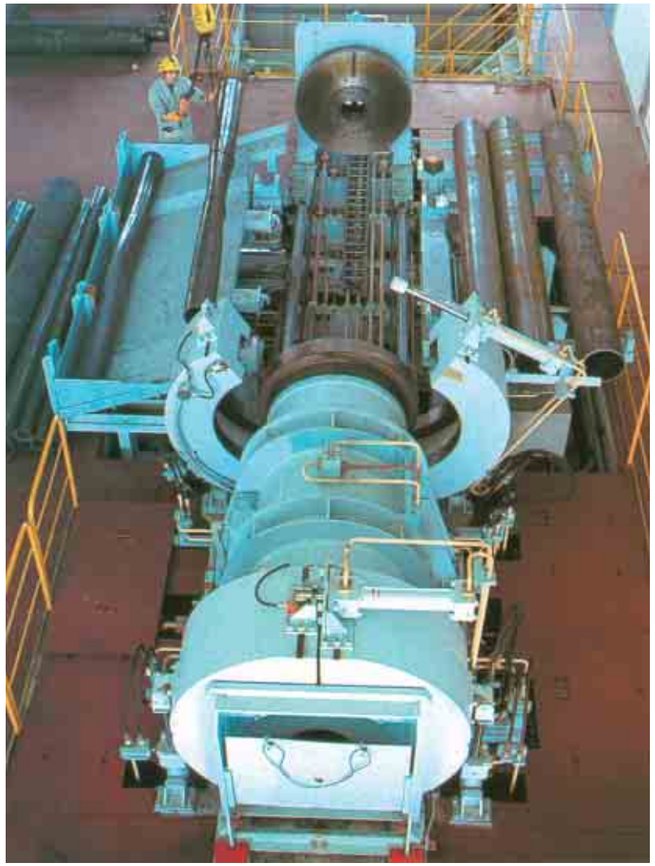
Measuring Results of Roundness



Research and Development

Nippon Steel's Research specialists are always working to develop new products with higher performance properties suited to increasingly severe service environments.

Tension and Compression Tester

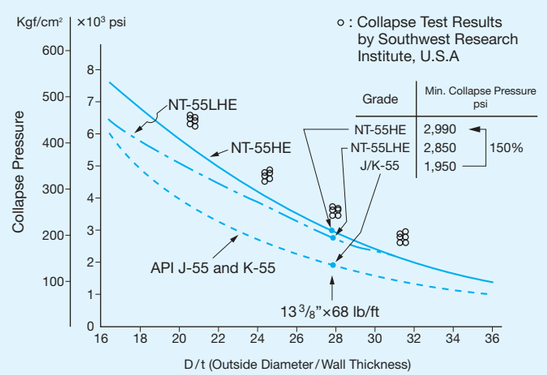


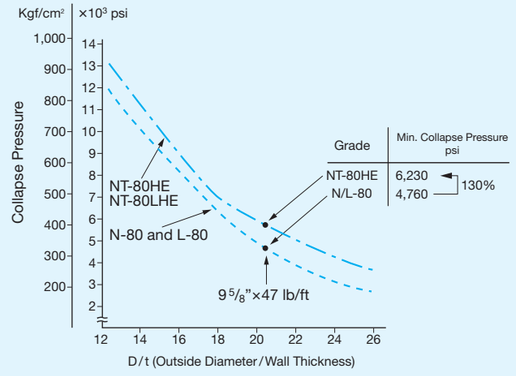
Collapse Tester

Research and Development Roll Forming Line

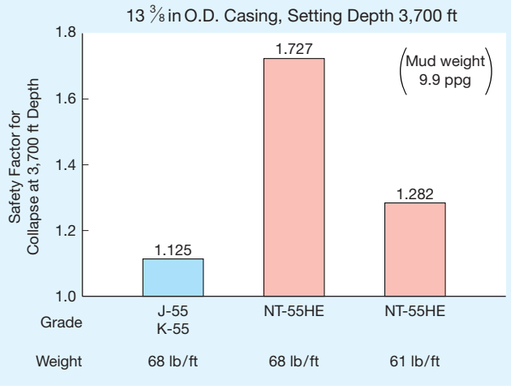
Performance Properties

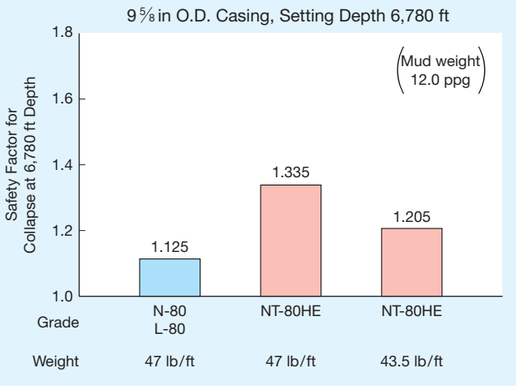
(1) T.U.F. has Higher Collapse Resistance than API



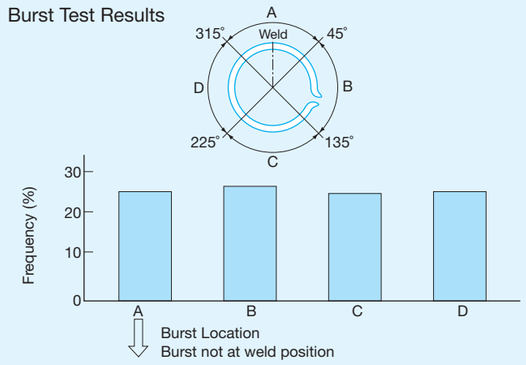


(2) Higher Safety Factor and Lighter Well Design



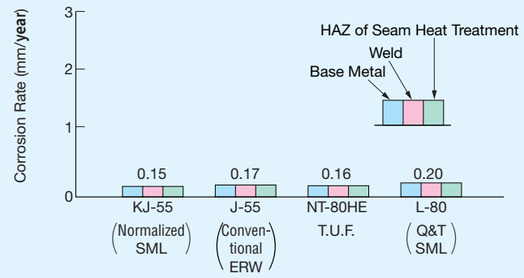


(3) High Reliability of Weld Quality



Localized Corrosion in H_2S Environment

Gas	Solution	Temperature	Flow Velocity
H_2S 1 atm	Substitute Seawater	25°C	1 m/sec



Performance Properties

Example of Lighter Well Design

Typical Well Design

OD in (mud)	API Grade Only	T.U.F. Casings
13-3/8 (9.2 ppg)	Depth 1,000 ft – 4,500 ft: N-80, 29.0 lb/ft BTC; N-80, 72.0 lb/ft STC; N-80, 43.5 lb/ft LTC	Depth 2,000 ft – 4,500 ft: NT-80HE, 26.0 lb/ft BTC; NT-80HE, 68.0 lb/ft STC; NT-80HE, 40.0 lb/ft LTC
9-5/8 (10.5 ppg)	6,000 ft – 9,000 ft: N-80, 29.0 lb/ft LTC; N-80, 53.5 lb/ft LTC	4,500 ft – 7,500 ft: NT-80HE, 26.0 lb/ft LTC; NT-80HE, 53.5 lb/ft LTC
7 (11.5 ppg)	9,000 ft – 12,000 ft: N-80, 32.0 lb/ft LTC	7,500 ft – 12,000 ft: NT-80HE, 32.0 lb/ft LTC
Total Casing Weight	1,102,500 lbs (100%)	1,052,750 lbs (95.5%)

Design Factors: 1.125 for Collapse, 1.0 for Burst, 1.8 for Tension.

Performance Properties and Dimensions

Size (in)	Weight (lbs/ft)	Grade	W.T. (in)	Collapse (psi)	Min. Internal Yield Pressure (psi)				Joint Strength (1,000 lbs)			PBYS (1,000 lbs)	Drift D. (in)
					PE	STC	LTC	BTC	STC	LTC	BTC		
4½	9.50	H-40	0.205	2760	3190	3190			77			111	3.965
	9.50	J-55	0.205	3300	4380	4380			101			152	3.965
	9.50	NT-55LHE	0.205	4410	4640	4640		4640	101		186	152	4.005
	9.50	K-55	0.205	3300	4380	4380			112			152	3.965
	9.50	NT-55HE	0.205	5000	4640	4640		4640	112		229	152	4.005
	9.50	NT-55LE	0.205	3300	4640	4640			101			152	4.005
	9.50	NT-80LHE	0.205	5450	6740	6740		6740	140		241	221	4.005
	9.50	NT-80DE	0.205	3900	6740	6740			143			221	4.005
	9.50	NT-80HE	0.205	5450	6740	6740		6740	143		252	221	4.005
	9.50	NT-80LE	0.205	3900	6740	6740			140			221	4.005
	10.50	J-55	0.224	3990	4800	4800		4800	133		203	166	3.927
	10.50	NT-55LHE	0.224	4950	5070	5070	5070	5070	133	140	203	166	3.967
	10.50	K-55	0.224	3990	4800	4800		4800	147		250	166	3.927
	10.50	NT-55HE	0.224	5710	5070	5070	5070	5070	147	155	250	166	3.967
	10.50	NT-55LE	0.224	3990	5070	5070		5070	133		203	166	3.967
	10.50	NT-80LHE	0.224	6380	7380	7380	7380	7380	183	183	263	241	3.967
	10.50	NT-80DE	0.224	4940	7380	7380		7380	186		274	241	3.967
	10.50	NT-80HE	0.224	6380	7380	7380	7380	7380	186	192	274	241	3.967
	10.50	NT-80LE	0.224	4940	7380	7380		7380	183		263	241	3.967
	11.60	J-55	0.250	4960	5350	5350	5350	5350	154	162	225	184	3.875
	11.60	NT-55LHE	0.250	5680	5650	5650	5650	5650	154	162	225	184	3.915
	11.60	K-55	0.250	4960	5350	5350	5350	5350	170	180	277	184	3.875
	11.60	NT-55HE	0.250	6620	5650	5650	5650	5650	170	180	277	184	3.915
	11.60	NT-55LE	0.250	4960	5650	5650	5650	5650	154	162	225	184	3.915
	11.60	L-80	0.250	6360	7780		7780	7780		212	291	267	3.875
	11.60	N-80	0.250	6360	7780		7780	7780		223	304	267	3.875
	11.60	NT-80LHE	0.250	7500	8220	8220	8220	8220	212	212	291	267	3.915
	11.60	NT-80DE	0.250	6360	8220	8220	8220	8220	216	223	304	267	3.915
	11.60	NT-80HE	0.250	7500	8220	8220	8220	8220	216	223	304	267	3.915
	11.60	NT-80LE	0.250	6360	8220	8220	8220	8220	212	212	291	267	3.915
	13.50	NT-55LHE	0.290	6720	6560		6560	6560		196	258	211	3.835
	13.50	NT-55HE	0.290	7890	6560		6560	6560		218	318	211	3.835
	13.50	NT-55LE	0.290	6420	6560		6560	6560		196	258	211	3.835
	13.50	L-80	0.290	8540	9020		9020	9020		257	334	307	3.795
	13.50	N-80	0.290	8540	9020		9020	9020		270	349	307	3.795
	13.50	NT-80LHE	0.290	9020	9540		9540	9540		257	334	307	3.835
	13.50	NT-80DE	0.290	8540	9540		9540	9540		270	349	307	3.835
	13.50	NT-80HE	0.290	9020	9540		9540	9540		270	349	307	3.835
	13.50	NT-80LE	0.290	8540	9540		9540	9540		257	334	307	3.835
	15.10	NT-55LHE	0.337	7920	7620		7320	6740		236	297	242	3.741
	15.10	NT-55HE	0.337	9320	7620		7320	6740		261	365	242	3.741
	15.10	NT-55LE	0.337	7620	7620		7320	6740		236	297	242	3.741
	15.10	NT-80LHE	0.337	10700	11080		10650	9800		308	384	353	3.741
	15.10	NT-80DE	0.337	11090	11080		10650	9800		325	401	353	3.741
	15.10	NT-80HE	0.337	10700	11080		10650	9800		325	401	353	3.741
	15.10	NT-80LE	0.337	11090	11080		10650	9800		308	384	353	3.741
5	11.50	J-55	0.220	3060	4240	4240			133			182	4.435
	11.50	NT-55LHE	0.220	4190	4480	4480	4480	4480	133	150	221	182	4.475
	11.50	K-55	0.220	3060	4240	4240			147			182	4.435
	11.50	NT-55HE	0.220	4710	4480	4480	4480	4480	147	166	271	182	4.475
	11.50	NT-55LE	0.220	3060	4480	4480			133			182	4.475
	11.50	NT-80LHE	0.220	5080	6510	6510	6510	6510	184	199	286	264	4.475
	11.50	NT-80DE	0.220	3560	6510	6510			188			264	4.475
	11.50	NT-80HE	0.220	5080	6510	6510	6510	6510	188	209	299	264	4.475
	11.50	NT-80LE	0.220	3560	6510	6510			184			264	4.475
	13.00	J-55	0.253	4140	4870	4870	4870	4870	169	182	252	208	4.369
	13.00	NT-55LHE	0.253	5070	5150	5150	5150	5150	169	182	252	208	4.409
	13.00	K-55	0.253	4140	4870	4870	4870	4870	186	201	309	208	4.369
	13.00	NT-55HE	0.253	5860	5150	5150	5150	5150	186	201	309	208	4.409
	13.00	NT-55LE	0.253	4140	5150	5150	5150	5150	169	182	252	208	4.409
	13.00	NT-80LHE	0.253	6560	7490	7490	7490	7490	233	241	327	302	4.409
	13.00	NT-80DE	0.253	5140	7490	7490	7490	7490	237	254	341	302	4.409
	13.00	NT-80HE	0.253	6560	7490	7490	7490	7490	237	254	341	302	4.409
	13.00	NT-80LE	0.253	5140	7490	7490	7490	7490	233	241	327	302	4.409

Performance Properties and Dimensions

Size (in)	Weight (lbs/ft)	Grade	W.T. (in)	Collapse (psi)	Min. Internal Yield Pressure (psi)				Joint Strength (1,000 lbs)			PBYS (1,000 lbs)	Drift D. (in)
					PE	STC	LTC	BTC	STC	LTC	BTC		
5	15.00	J-55	0.296	5560	5700	5700	5700	5700	207	223	293	241	4.283
	15.00	NT-55LHE	0.296	6110	6020	6020	6020	6020	207	223	293	241	4.323
	15.00	K-55	0.296	5560	5700	5700	5700	5700	228	246	359	241	4.283
	15.00	NT-55HE	0.296	7150	6020	6020	6020	6020	228	246	359	241	4.323
	15.00	NT-55LE	0.296	5560	6020	6020	6020	6020	207	223	293	241	4.323
	15.00	L-80	0.296	7250	8290		8290	8290		295	379	350	4.283
	15.00	N-80	0.296	7250	8290		8290	8290		311	396	350	4.283
	15.00	NT-80LHE	0.296	8140	8760	8760	8760	8760	286	295	379	350	4.323
	15.00	NT-80DE	0.296	7250	8760	8760	8760	8760	291	311	396	350	4.323
	15.00	NT-80HE	0.296	8140	8760	8760	8760	8760	291	311	396	350	4.323
	15.00	NT-80LE	0.296	7250	8760	8760	8760	8760	286	295	379	350	4.323
	18.00	NT-55LHE	0.362	7640	7370		7370	6820		284	353	290	4.191
	18.00	NT-55HE	0.362	8980	7370		7370	6820		314	432	290	4.191
	18.00	NT-55LE	0.362	7490	7370		7370	6820		284	353	290	4.191
	18.00	L-80	0.362	10500	10140		10140	9910		376	457	422	4.151
	18.00	N-80	0.362	10500	10140		10140	9910		396	477	422	4.151
	18.00	NT-80LHE	0.362	10300	10720		10720	9910		376	457	422	4.191
	18.00	NT-80DE	0.362	10500	10720		10720	9910		396	477	422	4.191
	18.00	NT-80HE	0.362	10300	10720		10720	9910		396	477	422	4.191
	18.00	NT-80LE	0.362	10500	10720		10720	9910		376	457	422	4.191
	21.40	NT-55LHE	0.437	9350	8890		7440	6820		352	403	345	4.041
	21.40	NT-55HE	0.437	11020	8890		7440	6820		389	510	345	4.041
	21.40	NT-55LE	0.437	8770	8890		7440	6820		352	403	345	4.041
	21.40	L-80	0.437	12760	12220		10820	9910		466	510	501	4.001
	21.40	N-80	0.437	12760	12220		10820	9910		490	537	501	4.001
	21.40	NT-80LHE	0.437	12670	12940		10820	9910		466	510	501	4.041
	21.40	NT-80DE	0.437	12760	12940		10820	9910		490	537	501	4.041
	21.40	NT-80HE	0.437	12670	12940		10820	9910		490	537	501	4.041
	21.40	NT-80LE	0.437	12760	12940		10820	9910		466	510	501	4.041
	23.20	NT-55LHE	0.478	10290	9730		7440	6820		388	403	373	3.959
	23.20	NT-55HE	0.478	12140	9730		7440	6820		428	510	373	3.959
	23.20	NT-55LE	0.478	9510	9730		7440	6820		388	403	373	3.959
	23.20	L-80	0.478	13830	13380		10820	9910		513	510	543	3.919
	23.20	N-80	0.478	13830	13380		10820	9910		540	537	543	3.919
	23.20	NT-80LHE	0.478	13960	14150		10820	9910		513	510	543	3.959
	23.20	NT-80DE	0.478	13830	14150		10820	9910		540	537	543	3.959
	23.20	NT-80HE	0.478	13960	14150		10820	9910		540	537	543	3.959
	23.20	NT-80LE	0.478	13830	14150		10820	9910		513	510	543	3.959
	24.10	NT-55LHE	0.500	10800	10180		7440	6820		407	403	389	3.915
	24.10	NT-55HE	0.500	12740	10180		7440	6820		449	510	389	3.915
	24.10	NT-55LE	0.500	9900	10180		7440	6820		407	403	389	3.915
	24.10	L-80	0.500	14400	14000		10820	9910		538	510	565	3.875
	24.10	N-80	0.500	14400	14000		10820	9910		567	537	565	3.875
	24.10	NT-80LHE	0.500	14650	14800		10820	9910		538	510	565	3.915
	24.10	NT-80DE	0.500	14400	14800		10820	9910		567	537	565	3.915
	24.10	NT-80HE	0.500	14650	14800		10820	9910		567	537	565	3.915
	24.10	NT-80LE	0.500	14400	14800		10820	9910		538	510	565	3.915
5½	14.00	H-40	0.244	2620	3110	3110			130			161	4.887
	14.00	J-55	0.244	3120	4270	4270			172			222	4.887
	14.00	NT-55LHE	0.244	4250	4510	4510	4510	4510	172	185	267	222	4.927
	14.00	K-55	0.244	3120	4270	4270			189			222	4.887
	14.00	NT-55HE	0.244	4780	4510	4510	4510	4510	189	204	327	222	4.927
	14.00	NT-55LE	0.244	3120	4510	4510			172			222	4.927
	14.00	NT-80LHE	0.244	5170	6570	6570	6570	6570	238	254	347	322	4.927
	14.00	NT-80DE	0.244	3620	6570	6570			243			322	4.927
	14.00	NT-80HE	0.244	5170	6570	6570	6570	6570	243	261	362	322	4.927
	14.00	NT-80LE	0.244	3620	6570	6570			238			322	4.927
	14.00	NT-95HE	0.244	5580	7800	7800			281			383	4.927
	15.50	J-55	0.275	4040	4810	4810	4810	4810	202	217	300	248	4.825
	15.50	NT-55LHE	0.275	5000	5090	5090	5090	5090	202	217	300	248	4.865
	15.50	K-55	0.275	4040	4810	4810	4810	4810	222	239	366	248	4.825
	15.50	NT-55HE	0.275	5760	5090	5090	5090	5090	222	239	366	248	4.865
	15.50	NT-55LE	0.275	4040	5090	5090	5090	5090	202	217	300	248	4.865
	15.50	NT-80LHE	0.275	6430	7400	7400	7400	7400	279	298	389	361	4.865
	15.50	NT-80DE	0.275	4990	7400	7400	7400	7400	284	306	406	361	4.865
	15.50	NT-80HE	0.275	6430	7400	7400	7400	7400	284	306	406	361	4.865
	15.50	NT-80LE	0.275	4990	7400	7400	7400	7400	279	298	389	361	4.865
	15.50	NT-95HE	0.275	7510	8790	8790	8790	8790	329	345	453	429	4.865

Size (in)	Weight (lbs/ft)	Grade	W.T. (in)	Collapse (psi)	Min. Internal Yield Pressure (psi)				Joint Strength (1,000 lbs)			PBYS (1,000 lbs)	Drift D. (in)
					PE	STC	LTC	BTC	STC	LTC	BTC		
5½	17.00	J-55	0.304	4910	5320	5320	5320	5320	229	247	329	273	4.767
	17.00	NT-55LHE	0.304	5650	5620	5620	5620	5620	229	247	329	273	4.807
	17.00	K-55	0.304	4910	5320	5320	5320	5320	252	272	402	273	4.767
	17.00	NT-55HE	0.304	6580	5620	5620	5620	5620	252	272	402	273	4.807
	17.00	NT-55LE	0.304	4910	5620	5620	5620	5620	229	247	329	273	4.807
	17.00	L-80	0.304	6290	7740		7740	7740		338	428	397	4.767
	17.00	N-80	0.304	6290	7740		7740	7740		348	446	397	4.767
	17.00	NT-80LHE	0.304	7450	8180	8180	8180	8180	317	338	428	397	4.807
	17.00	NT-80DE	0.304	6290	8180	8180	8180	8180	323	348	446	397	4.807
	17.00	NT-80HE	0.304	7450	8180	8180	8180	8180	323	348	446	397	4.807
	17.00	NT-80LE	0.304	6290	8180	8180	8180	8180	317	338	428	397	4.807
	17.00	NT-95HE	0.304	9140	9710	9710	9710	9710	374	392	498	471	4.807
	20.00	NT-55LHE	0.361	6860	6680		6680	6180		304	387	321	4.693
	20.00	NT-55HE	0.361	8050	6680		6680	6180		334	472	321	4.693
	20.00	NT-55LE	0.361	6620	6680		6680	6180		304	387	321	4.693
	20.00	L-80	0.361	8840	9190		9190	9000		416	503	466	4.653
	20.00	N-80	0.361	8840	9190		9190	9000		428	524	466	4.653
	20.00	NT-80LHE	0.361	9210	9710		9710	9000		416	503	466	4.693
	20.00	NT-80DE	0.361	8840	9710		9710	9000		428	524	466	4.693
	20.00	NT-80HE	0.361	9210	9710		9710	9000		428	524	466	4.693
	20.00	NT-80LE	0.361	8840	9710		9710	9000		416	503	466	4.693
	23.00	NT-55LHE	0.415	7990	7680		6790	6180		356	435	365	4.585
	23.00	NT-55HE	0.415	9400	7680		6790	6180		392	537	365	4.585
	23.00	NT-55LE	0.415	7670	7680		6790	6180		356	435	365	4.585
	23.00	L-80	0.415	11160	10560		9880	9000		489	551	530	4.545
	23.00	N-80	0.415	11160	10560		9880	9000		502	580	530	4.545
	23.00	NT-80LHE	0.415	10790	11170		9880	9000		489	551	530	4.585
	23.00	NT-80DE	0.415	11160	11170		9880	9000		502	580	530	4.585
	23.00	NT-80HE	0.415	10790	11170		9880	9000		502	580	530	4.585
	23.00	NT-80LE	0.415	11160	11170		9880	9000		489	551	530	4.585
6⅝	20.00	H-40	0.288	2520	3040	3040			184			229	5.924
	20.00	J-55	0.288	2970	4180	4180	4180	4180	245	266	374	315	5.924
	20.00	NT-55LHE	0.288	4120	4420	4420	4420	4420	245	266	374	315	5.964
	20.00	K-55	0.288	2970	4180	4180	4180	4180	267	290	453	315	5.924
	20.00	NT-55HE	0.288	4610	4420	4420	4420	4420	267	290	453	315	5.964
	20.00	NT-55LE	0.288	2970	4420	4420	4420	4420	245	266	374	315	5.964
	20.00	NT-80LHE	0.288	4950	6430	6430	6430	6430	340	369	489	459	5.964
	20.00	NT-80DE	0.288	3480	6430	6430	6430	6430	346	375	509	459	5.964
	20.00	NT-80HE	0.288	4950	6430	6430	6430	6430	346	375	509	459	5.964
	20.00	NT-80LE	0.288	3480	6430	6430	6430	6430	340	369	489	459	5.964
	20.00	NT-95HE	0.288	5280	7640	7640	7640	7640	401	434	569	545	5.964
	24.00	J-55	0.352	4560	5110	5110	5110	5110	314	340	453	382	5.796
	24.00	NT-55LHE	0.352	5390	5410	5410	5410	5410	314	340	453	382	5.836
	24.00	K-55	0.352	4560	5110	5110	5110	5110	342	372	548	382	5.796
	24.00	NT-55HE	0.352	6260	5410	5410	5410	5410	342	372	448	382	5.836
	24.00	NT-55LE	0.352	4560	5410	5410	5410	5410	314	340	453	382	5.836
	24.00	L-80	0.352	5760	7440		7440	7440		473	592	555	5.796
	24.00	N-80	0.352	5760	7440		7440	7440		481	615	555	5.796
	24.00	NT-80LHE	0.352	7060	7860	7860	7860	7860	436	473	592	555	5.836
	24.00	NT-80DE	0.352	5760	7860	7860	7860	7860	443	481	615	555	5.836
	24.00	NT-80HE	0.352	7060	7860	7860	7860	7860	443	481	615	555	5.836
	24.00	NT-80LE	0.352	5760	7860	7860	7860	7860	436	473	592	555	5.836
	24.00	NT-95HE	0.352	8510	9340	9340	9340	9340	514	557	689	659	5.836
	28.00	NT-55LHE	0.417	6550	6400		6400	6400		415	531	447	5.706
	28.00	NT-55HE	0.417	7680	6400		6400	6400		454	643	447	5.706
	28.00	NT-55LE	0.417	6170	6400		6400	6400		415	531	447	5.706
	28.00	L-80	0.417	8170	8810		8810	8810		576	693	651	5.666
	28.00	N-80	0.417	8170	8810		8810	8810		586	721	651	5.666
	28.00	NT-80LHE	0.417	8770	9320		9320	9320		576	693	651	5.706
	28.00	NT-80DE	0.417	8170	9320		9320	9320		586	721	651	5.706
	28.00	NT-80HE	0.417	8770	9320		9320	9320		586	721	651	5.706
	28.00	NT-80LE	0.417	8170	9320		9320	9320		576	693	651	5.706
	32.00	NT-55LHE	0.475	7560	7300		7300	6750		480	599	505	5.590
	32.00	NT-55HE	0.475	8890	7300		7300	6750		525	725	505	5.590
	32.00	NT-55LE	0.475	7320	7300		7300	6750		480	599	505	5.590
	32.00	L-80	0.475	10320	10040		10040	9820		666	783	734	5.550
	32.00	N-80	0.475	10320	10040		10040	9820		678	814	734	5.550
	32.00	NT-80LHE	0.475	10190	10610		10610	9820		666	783	734	5.590
	32.00	NT-80DE	0.475	10320	10610		10610	9820		678	814	734	5.590
	32.00	NT-80HE	0.475	10190	10610		10610	9820		678	814	734	5.590
	32.00	NT-80LE	0.475	10320	10610		10610	9820		666	783	734	5.590

Performance Properties and Dimensions

Size (in)	Weight (lbs/ft)	Grade	W.T. (in)	Collapse (psi)	Min. Internal Yield Pressure (psi)				Joint Strength (1,000 lbs)			PBYS (1,000 lbs)	Drift D. (in)
					PE	STC	LTC	BTC	STC	LTC	BTC		
7	17.00	H-40	0.231	1420	2310	2310			122			196	6.413
	17.00	NT-55LHE	0.231	2310	3360	3360		3360	162		319	270	6.453
	17.00	NT-55HE	0.231	2380	3360	3360		3360	176		385	270	6.453
	17.00	NT-55LE	0.231	1630	3360	3360			162			270	6.453
	17.00	NT-80LHE	0.231	2430	4880	4880		4880	227		417	393	6.453
	17.00	NT-80DE	0.231	1800	4880	4880			230			393	6.453
	17.00	NT-80HE	0.231	2430	4880	4880		4880	230		434	393	6.453
	17.00	NT-95HE	0.231	2370	5800	5800		5800	267		486	467	6.453
	20.00	H-40	0.272	1970	2720	2720			176			230	6.331
	20.00	J-55	0.272	2270	3740	3740			234			316	6.331
	20.00	NT-55LHE	0.272	3380	3950	3950		3950	234		373	316	6.371
	20.00	K-55	0.272	2270	3740	3740			254			316	6.331
	20.00	NT-55HE	0.272	3640	3950	3950		3950	254		451	316	6.371
	20.00	NT-55LE	0.272	2270	3950	3950			234			316	6.371
	20.00	NT-80LHE	0.272	3800	5750	5750		5750	325		488	460	6.371
	20.00	NT-80DE	0.272	2740	5750	5750			331			460	6.371
	20.00	NT-80HE	0.272	3800	5750	5750		5750	331		508	460	6.371
	20.00	NT-95HE	0.272	3840	6830	6830		6830	384		569	546	6.371
	23.00	J-55	0.317	3270	4360	4360	4360	4360	284	313	432	366	6.241
	23.00	NT-55LHE	0.317	4380	4610	4610	4610	4610	284	313	432	366	6.250
	23.00	K-55	0.317	3270	4360	4360	4360	4360	309	341	522	366	6.241
	23.00	NT-55HE	0.317	4950	4610	4610	4610	4610	309	341	522	366	6.250
	23.00	NT-55LE	0.317	3270	4610	4610	4610	4610	284	313	432	366	6.250
	23.00	L-80	0.317	3840	6340		6340	6340		435	565	532	6.241
	23.00	N-80	0.317	3840	6340		6340	6340		442	588	532	6.241
	23.00	NT-80LHE	0.317	5390	6700	6700	6700	6700	396	435	565	532	6.250
	23.00	NT-80DE	0.317	3840	6700	6700	6700	6700	402	442	588	532	6.250
	23.00	NT-80HE	0.317	5390	6700	6700	6700	6700	402	442	588	532	6.250
	23.00	NT-80LE	0.317	3840	6700	6700	6700	6700	396	435	565	532	6.250
	23.00	NT-95HE	0.317	5890	7960	7960	7960	7960	466	512	659	632	6.250
	26.00	J-55	0.362	4330	4980	4980	4980	4980	334	367	490	415	6.151
	26.00	NT-55LHE	0.362	5210	5260	5260	5260	5260	334	367	490	415	6.191
	26.00	K-55	0.362	4330	4980	4980	4980	4980	364	401	592	415	6.151
	26.00	NT-55HE	0.362	6040	5260	5260	5260	5260	364	401	592	415	6.191
	26.00	NT-55LE	0.362	4330	5260	5260	5260	5260	334	367	490	415	6.191
	26.00	L-80	0.362	5410	7240		7240	7240		511	641	604	6.151
	26.00	N-80	0.362	5410	7240		7240	7240		519	667	604	6.151
	26.00	NT-80LHE	0.362	6780	7650	7650	7650	7650	465	511	641	604	6.191
	26.00	NT-80DE	0.362	5410	7650	7650	7650	7650	472	519	667	604	6.191
	26.00	NT-80HE	0.362	6780	7650	7650	7650	7650	472	519	667	604	6.191
	26.00	NT-80LE	0.362	5410	7650	7650	7650	7650	465	511	641	604	6.191
	26.00	NT-95HE	0.362	8070	9090	9090	9090	9090	548	602	747	717	6.191
	29.00	NT-55LHE	0.408	6000	5930		5930	5820		423	548	465	6.099
	29.00	NT-55HE	0.408	7020	5930		5930	5820		461	662	465	6.099
	29.00	NT-55LE	0.408	5410	5930		5930	5820		423	548	465	6.099
	29.00	L-80	0.408	7030	8160		8160	8160		587	718	676	6.059
	29.00	N-80	0.408	7030	8160		8160	8160		597	746	676	6.059
	29.00	NT-80LHE	0.408	7990	8630		8630	8460		587	718	676	6.099
	29.00	NT-80DE	0.408	7030	8630		8630	8460		597	746	676	6.099
	29.00	NT-80HE	0.408	7990	8630		8630	8460		597	746	676	6.099
	29.00	NT-80LE	0.408	7030	8630		8630	8460		587	718	676	6.099
	32.00	NT-55LHE	0.453	6750	6580		6350	5820		476	605	512	6.000
	32.00	NT-55HE	0.453	7920	6580		6350	5820		519	730	512	6.000
	32.00	NT-55LE	0.453	6460	6580		6350	5820		476	605	512	6.000
	32.00	L-80	0.453	8610	9060		9060	8460		661	791	745	5.969
	32.00	N-80	0.453	8610	9060		9060	8460		672	823	745	5.969
	32.00	NT-80LHE	0.453	9060	9580		9240	8460		661	791	745	6.000
	32.00	NT-80DE	0.453	8610	9580		9240	8460		672	823	745	6.000
	32.00	NT-80HE	0.453	9060	9580		9240	8460		672	823	745	6.000
	32.00	NT-80LE	0.453	8610	9580		9240	8460		661	791	745	6.000
	35.00	NT-55LHE	0.498	7490	7240		6350	5820		528	657	559	5.919
	35.00	NT-55HE	0.498	8810	7240		6350	5820		576	797	559	5.919
	35.00	NT-55LE	0.498	7270	7240		6350	5820		528	657	559	5.919
	35.00	L-80	0.498	10190	9960		9240	8460		734	832	814	5.879
	35.00	N-80	0.498	10190	9960		9240	8460		746	876	814	5.879
	35.00	NT-80LHE	0.498	10100	10530		9240	8460		734	832	814	5.919
	35.00	NT-80DE	0.498	10190	10530		9240	8460		746	876	814	5.919
	35.00	NT-80HE	0.498	10100	10530		9240	8460		746	876	814	5.919
	35.00	NT-80LE	0.498	10190	10530		9240	8460		734	832	814	5.919

Size (in)	Weight (lbs/ft)	Grade	W.T. (in)	Collapse (psi)	Min. Internal Yield Pressure (psi)				Joint Strength (1,000 lbs)			PBYS (1,000 lbs)	Drift D. (in)
					PE	STC	LTC	BTC	STC	LTC	BTC		
7⅝	24.00	H-40	0.300	2030	2750	2750			212			276	6.900
	24.00	NT-55LHE	0.300	3470	4000	4000		4000	282		444	380	6.940
	24.00	NT-55HE	0.300	3750	4000	4000		4000	306		533	380	6.940
	24.00	NT-55LE	0.300	2320	4000	4000		4000	282		444	380	6.940
	24.00	NT-80LHE	0.300	3920	5820	5820		5820	393		583	552	6.940
	24.00	NT-80DE	0.300	2820	5820	5820			399			552	6.940
	24.00	NT-80HE	0.300	3920	5820	5820		5820	399		605	552	6.940
	24.00	NT-80LE	0.300	2820	5820	5820			393			552	6.940
	24.00	NT-95HE	0.300	3980	6910	6910		6910	463		679	656	6.940
	26.40	J-55	0.328	2900	4140	4140	4140	4140	315	346	483	414	6.844
	26.40	NT-55LHE	0.328	4050	4380	4380	4380	4380	315	346	483	414	6.884
	26.40	K-55	0.328	2900	4140	4140	4140	4140	342	377	581	414	6.844
	26.40	NT-55HE	0.328	4520	4380	4380	4380	4380	342	377	581	414	6.884
	26.40	NT-55LE	0.328	2900	4380	4380	4380	4380	315	346	483	414	6.884
	26.40	L-80	0.328	3400	6020		6020	6020		482	635	602	6.844
	26.40	N-80	0.328	3400	6020		6020	6020		490	659	602	6.844
	26.40	NT-80LHE	0.328	4840	6370	6370	6370	6370	440	482	635	602	6.884
	26.40	NT-80DE	0.328	3400	6370	6370	6370	6370	446	490	659	602	6.884
	26.40	NT-80HE	0.328	4840	6370	6370	6370	6370	446	490	659	602	6.884
	26.40	NT-80LE	0.328	3400	6370	6370	6370	6370	440	482	635	602	6.884
	26.40	NT-95HE	0.328	5130	7560	7560	7560	7560	518	568	740	714	6.884
	29.70	NT-55LHE	0.375	4890	5000		5000	5000		407	549	470	6.790
	29.70	NT-55HE	0.375	5630	5000		5000	5000		443	660	470	6.790
	29.70	NT-55LE	0.375	3910	5000		5000	5000		407	549	470	6.790
	29.70	L-80	0.375	4790	6890		6890	6890		567	721	683	6.750
	29.70	N-80	0.375	4790	6890		6890	6890		575	749	683	6.750
	29.70	NT-80LHE	0.375	6260	7280		7280	7280		567	721	683	6.790
	29.70	NT-80DE	0.375	4790	7280		7280	7280		575	749	683	6.790
	29.70	NT-80HE	0.375	6260	7280		7280	7280		575	749	683	6.790
	29.70	NT-80LE	0.375	4790	7280		7280	7280		567	721	683	6.790
	29.70	NT-95HE	0.375	7230	8640		8640	8640		668	841	811	6.790
	33.70	NT-55LHE	0.430	5780	5740		5740	5740		477	625	535	6.680
	33.70	NT-55HE	0.430	6740	5740		5740	5740		519	751	535	6.680
	33.70	NT-55LE	0.430	5100	5740		5740	5740		477	625	535	6.680
	33.70	L-80	0.430	6560	7900		7900	7900		664	820	778	6.640
	33.70	N-80	0.430	6560	7900		7900	7900		674	852	778	6.640
	33.70	NT-80LHE	0.430	7650	8350		8350	8350		664	820	778	6.680
	33.70	NT-80DE	0.430	6560	8350		8350	8350		674	852	778	6.680
	33.70	NT-80HE	0.430	7650	8350		8350	8350		674	852	778	6.680
	33.70	NT-80LE	0.430	6560	8350		8350	8350		664	820	778	6.680
	39.00	NT-55LHE	0.500	6850	6670		6670	6670		564	720	616	6.540
	39.00	NT-55HE	0.500	8040	6670		6670	6670		614	864	616	6.540
	39.00	NT-55LE	0.500	6610	6670		6670	6670		564	720	616	6.540
	39.00	L-80	0.500	8820	9180		9180	9180		786	945	895	6.500
	39.00	N-80	0.500	8820	9180		9180	9180		798	981	895	6.500
	39.00	NT-80LHE	0.500	9200	9700		9700	9700		786	945	895	6.540
	39.00	NT-80DE	0.500	8820	9700		9700	9700		798	981	895	6.540
	39.00	NT-80HE	0.500	9200	9700		9700	9700		798	981	895	6.540
	39.00	NT-80LE	0.500	8820	9700		9700	9700		786	945	895	6.540
8⅝	24.00	H-40	0.264	1230	2140	2140			183			277	7.972
	24.00	J-55	0.264	1340	2950	2950			244			381	7.972
	24.00	NT-55LHE	0.264	1890	3110	3110		3110	244		439	381	8.012
	24.00	K-55	0.264	1340	2950	2950			263			381	7.972
	24.00	NT-55HE	0.264	1930	3110	3110		3110	263		523	381	8.012
	24.00	NT-55LE	0.264	1340	3110	3110			244			381	8.012
	24.00	NT-80LHE	0.264	1960	4530	4530		4530	341		579	555	8.012
	24.00	NT-80DE	0.264	1430	4530	4530			346			555	8.012
	24.00	NT-80HE	0.264	1960	4530	4530		4530	346		600	555	8.012
	24.00	NT-80LE	0.264	1430	4530	4530			341			555	8.012
	24.00	NT-95HE	0.264	1890	5380	5380		5380	403		676	659	8.012
	28.00	H-40	0.304	1610	2470	2470			233			318	7.892
	28.00	NT-55LHE	0.304	2730	3590	3590		3590	311		503	437	7.932
	28.00	NT-55HE	0.304	2850	3590	3590		3590	336		599	437	7.932
	28.00	NT-55LE	0.304	1890	3590	3590			311			437	7.932
	28.00	NT-80LHE	0.304	2930	5220	5220		5220	434		664	636	7.932
	28.00	NT-80DE	0.304	2160	5220	5220			440			636	7.932
	28.00	NT-80HE	0.304	2930	5220	5220		5220	440		688	636	7.932
	28.00	NT-80LE	0.304	2160	5220	5220			434			636	7.932
	28.00	NT-95HE	0.304	2880	6190	6190		6190	512		775	755	7.932

Performance Properties and Dimensions

Size (in)	Weight (lbs/ft)	Grade	W.T. (in)	Collapse (psi)	Min. Internal Yield Pressure (psi)				Joint Strength (1,000 lbs)			PBYS (1,000 lbs)	Drift D. (in)
					PE	STC	LTC	BTC	STC	LTC	BTC		
8⅝	32.00	J-55	0.352	2530	3930	3930	3930	3930	372	417	579	503	7.796
	32.00	NT-55LHE	0.352	3710	4150	4150	4150	4150	372	417	579	503	7.875
	32.00	K-55	0.352	2530	3930	3930	3930	3930	402	452	690	503	7.796
	32.00	NT-55HE	0.352	4060	4150	4150	4150	4150	402	452	690	503	7.875
	32.00	NT-55LE	0.352	2530	4150	4150	4150	4150	372	417	579	503	7.875
	32.00	NT-80LHE	0.352	4280	6040	6040	6040	6040	521	583	764	732	7.875
	32.00	NT-80DE	0.352	3050	6040	6040	6040	6040	528	591	792	732	7.875
	32.00	NT-80HE	0.352	4280	6040	6040	6040	6040	528	591	792	732	7.875
	32.00	NT-80LE	0.352	3050	6040	6040	6040	6040	521	583	764	732	7.875
	32.00	NT-95HE	0.352	4420	7170	7170	7170	7170	614	687	892	869	7.875
	36.00	J-55	0.400	3450	4460	4460	4460	4460	434	486	654	568	7.700
	36.00	NT-55LHE	0.400	4530	4720	4720	4720	4720	434	486	654	568	7.740
	36.00	K-55	0.400	3450	4460	4460	4460	4460	468	526	780	568	7.700
	36.00	NT-55HE	0.400	5150	4720	4720	4720	4720	468	526	780	568	7.740
	36.00	NT-55LE	0.400	3450	4720	4720	4720	4720	434	486	654	568	7.740
	36.00	L-80	0.400	4100	6490		6490	6490		678	864	827	7.700
	36.00	N-80	0.400	4100	6490		6490	6490		688	895	827	7.700
	36.00	NT-80LHE	0.400	5640	6860	6860	6860	6860	606	678	864	827	7.740
	36.00	NT-80DE	0.400	4100	6860	6860	6860	6860	615	688	895	827	7.740
	36.00	NT-80HE	0.400	5640	6860	6860	6860	6860	615	688	895	827	7.740
	36.00	NT-80LE	0.400	4100	6860	6860	6860	6860	606	678	864	827	7.740
	36.00	NT-95HE	0.400	6270	8150	8150	8150	8150	715	800	1008	982	7.740
	40.00	NT-55LHE	0.450	5270	5310		5310	5310		556	732	636	7.625
	40.00	NT-55HE	0.450	6110	5310		5310	5310		603	872	636	7.625
	40.00	NT-55LE	0.450	4440	5310		5310	5310		556	732	636	7.625
	40.00	L-80	0.450	5530	7300		7300	7300		776	966	925	7.600
	40.00	N-80	0.450	5530	7300		7300	7300		788	1001	925	7.600
	40.00	NT-80LHE	0.450	6870	7720		7720	7720		776	966	925	7.625
	40.00	NT-80DE	0.450	5530	7720		7720	7720		788	1001	925	7.625
	40.00	NT-80HE	0.450	6870	7720		7720	7720		788	1001	925	7.625
	40.00	NT-80LE	0.450	5530	7720		7720	7720		776	966	925	7.625
	40.00	NT-95HE	0.450	8210	9170		9170	9170		916	1127	1098	7.625
	44.00	NT-55LHE	0.500	5970	5900		5900	5900		626	808	702	7.540
	44.00	NT-55HE	0.500	6970	5900		5900	5900		678	963	702	7.540
	44.00	NT-55LE	0.500	5360	5900		5900	5900		626	808	702	7.540
	44.00	L-80	0.500	6950	8120		8120	8120		874	1066	1021	7.500
	44.00	N-80	0.500	6950	8120		8120	8120		887	1105	1021	7.500
	44.00	NT-80LHE	0.500	7920	8580		8580	8580		874	1066	1021	7.540
	44.00	NT-80DE	0.500	6950	8580		8580	8580		887	1105	1021	7.540
	44.00	NT-80HE	0.500	7920	8580		8580	8580		887	1105	1021	7.540
	44.00	NT-80LE	0.500	6950	8580		8580	8580		874	1066	1021	7.540
	49.00	NT-55LHE	0.557	6740	6570		6570	6570		704	894	776	7.426
	49.00	NT-55HE	0.557	7910	6570		6570	6570		763	1065	776	7.426
	49.00	NT-55LE	0.557	6440	6570		6570	6570		704	894	776	7.426
	49.00	L-80	0.557	8580	9040		9040	9040		983	1180	1129	7.386
	49.00	N-80	0.557	8580	9040		9040	9040		997	1222	1129	7.386
	49.00	NT-80LHE	0.557	9050	9560		9560	9560		983	1180	1129	7.426
	49.00	NT-80DE	0.557	8580	9560		9560	9560		997	1222	1129	7.426
	49.00	NT-80HE	0.557	9050	9560		9560	9560		997	1222	1129	7.426
	49.00	NT-80LE	0.557	8580	9560		9560	9560		983	1180	1129	7.426
9⅝	32.30	H-40	0.312	1380	2270	2270			254			365	8.845
	32.30	NT-55LHE	0.312	2210	3300	3300	3300	3300	339	390	569	502	8.885
	32.30	NT-55HE	0.312	2270	3300	3300	3300	3300	365	421	672	502	8.885
	32.30	NT-55LE	0.312	1570	3300	3300			339			502	8.885
	32.30	NT-80LHE	0.312	2310	4800	4800	4800	4800	475	546	755	730	8.885
	32.30	NT-80DE	0.312	1700	4800	4800			481			730	8.885
	32.30	NT-80HE	0.312	2310	4800	4800	4800	4800	481	553	781	730	8.885
	32.30	NT-80CYHE	0.312	2360	4800	4800	4800	4800	481	553	781	730	8.885
	32.30	NT-80LE	0.312	1700	4800	4800			475			730	8.885
	32.30	NT-95HE	0.312	2250	5700	5700	5700	5700	560	644	882	867	8.885
	36.00	H-40	0.352	1720	2560	2560			294			410	8.765
	36.00	J-50	0.352	2020	3520	3520	3520	3520	394	453	639	564	8.765
	36.00	NT-55LHE	0.352	2970	3720	3720	3720	3720	394	453	639	564	8.805
	36.00	K-55	0.352	2020	3520	3520	3520	3520	423	489	755	564	8.765
	36.00	NT-55HE	0.352	3140	3720	3720	3720	3720	423	489	755	564	8.805
	36.00	NT-55LE	0.352	2020	3720	3720	3720	3720	394	453	639	564	8.805
	36.00	NT-80LHE	0.352	3240	5410	5410	5410	5410	551	634	848	820	8.805
	36.00	NT-80DE	0.352	2370	5410	5410	5410	5410	559	643	877	820	8.805
	36.00	NT-80HE	0.352	3240	5410	5410	5410	5410	559	643	877	820	8.805
	36.00	NT-80LE	0.352	2370	5410	5410	5410	5410	551	634	848	820	8.805
	36.00	NT-95HE	0.352	3220	6430	6430	6430	6430	651	747	991	974	8.805

Size (in)	Weight (lbs/ft)	Grade	W.T. (in)	Collapse (psi)	Min. Internal Yield Pressure (psi)				Joint Strength (1,000 lbs)			PBYS (1,000 lbs)	Drift D. (in)
					PE	STC	LTC	BTC	STC	LTC	BTC		
9⅝	40.00	J-55	0.395	2570	3950	3950	3950	3950	452	520	714	630	8.679
	40.00	NT-55LHE	0.395	3740	4180	4180	4180	4180	452	520	714	630	8.750
	40.00	K-55	0.395	2570	3950	3950	3950	3950	486	561	843	630	8.679
	40.00	NT-55HE	0.395	4110	4180	4180	4180	4180	486	561	843	630	8.750
	40.00	NT-55LE	0.395	2570	4180	4180	4180	4180	452	520	714	630	8.750
	40.00	L-80	0.395	3090	5750		5750	5750		727	947	916	8.679
	40.00	N-80	0.395	3090	5750		5750	5750		737	979	916	8.679
	40.00	NT-80LHE	0.395	4350	6070	6070	6070	6070	633	727	947	916	8.750
	40.00	NT-80DE	0.395	3090	6070	6070	6070	6070	642	737	979	916	8.750
	40.00	NT-80HE	0.395	4350	6070	6070	6070	6070	642	737	979	916	8.750
	40.00	NT-80LE	0.395	3090	6070	6070	6070	6070	633	727	947	916	8.750
	40.00	NT-95HE	0.395	4490	7210	7210	7210	7210	747	858	1106	1088	8.750
	43.50	NT-55LHE	0.435	4360	4600		4600	4600		582	783	691	8.639
	43.50	NT-55HE	0.435	4940	4600		4600	4600		628	925	691	8.639
	43.50	NT-55LE	0.435	3250	4600		4600	4600		582	783	691	8.639
	43.50	L-80	0.435	3810	6330		6330	6330		813	1038	1005	8.599
	43.50	N-80	0.435	3810	6330		6330	6330		825	1074	1005	8.599
	43.50	NT-80LHE	0.435	5370	6690		6690	6690		813	1038	1005	8.639
	43.50	NT-80DE	0.435	3810	6690		6690	6690		825	1074	1005	8.639
	43.50	NT-80HE	0.435	5370	6690		6690	6690		825	1074	1005	8.639
	43.50	NT-80LE	0.435	3810	6690		6690	6690		813	1038	1005	8.639
	43.50	NT-95HE	0.435	5860	7940		7940	7940		959	1213	1193	8.639
	47.00	NT-55LHE	0.472	4880	4990		4990	4990		638	846	746	8.565
	47.00	NT-55HE	0.472	5610	4990		4990	4990		689	999	746	8.565
	47.00	NT-55LE	0.472	3890	4990		4990	4990		638	846	746	8.565
	47.00	L-80	0.472	4760	6870		6870	6870		893	1122	1086	8.525
	47.00	N-80	0.472	4760	6870		6870	6870		905	1161	1086	8.525
	47.00	NT-80LHE	0.472	6230	7260		7260	7260		893	1122	1086	8.565
	47.00	NT-80DE	0.472	4760	7260		7260	7260		905	1161	1086	8.565
	47.00	NT-80HE	0.472	6230	7260		7260	7260		905	1161	1086	8.565
	47.00	NT-80LE	0.472	4760	7260		7260	7260		893	1122	1086	8.565
	47.00	NT-95HE	0.472	7180	8620		8460	8620		1053	1311	1289	8.565
	53.50	NT-55LHE	0.545	5810	5760		5760	5760		748	969	855	8.500
	53.50	NT-55HE	0.545	6780	5760		5760	5760		808	1145	855	8.500
	53.50	NT-55LE	0.545	5130	5760		5760	5760		748	969	855	8.500
	53.50	L-80	0.545	6620	7930		7930	7930		1047	1285	1244	8.419
	53.50	N-80	0.545	6620	7930		7930	7930		1062	1329	1244	8.419
	53.50	NT-80LHE	0.545	7700	8380		8380	8380		1047	1285	1244	8.500
	53.50	NT-80DE	0.545	6620	8380		8380	8380		1062	1329	1244	8.500
	53.50	NT-80HE	0.545	7700	8380		8380	8380		1062	1329	1244	8.500
	53.50	NT-80LE	0.545	6620	8380		8380	8380		1047	1285	1244	8.500
	53.50	NT-95HE	0.545	9510	9950		8460	9160		1235	1502	1477	8.500
10¾	32.75	H-40	0.279	840	1820	1820			205			367	10.036
	32.75	NT-55LHE	0.279	1180	2640	2640		2640	275		562	505	10.076
	32.75	NT-55HE	0.279	1190	2640	2640		2640	294		657	505	10.076
	32.75	NT-55LE	0.279	870	2640	2640			275			505	10.076
	32.75	NT-80LHE	0.279	1200	3840	3840		3840	387		750	734	10.076
	32.75	NT-80DE	0.279	870	3840	3840			392			734	10.076
	32.75	NT-80HE	0.279	1200	3840	3840		3840	392		774	734	10.076
	32.75	NT-80LE	0.279	870	3840	3840			387			734	10.076
	32.75	NT-95HE	0.279	1150	4560	4560		4560	457		877	872	10.076
	40.50	H-40	0.350	1390	2280	2280			314			457	9.894
	40.50	J-55	0.350	1590	3130	3130		3130	420		700	629	9.894
	40.50	NT-55LHE	0.350	2230	3310	3310		3310	420		700	629	9.934
	40.50	K-55	0.350	1590	3130	3130		3130	450		819	629	9.894
	40.50	NT-55HE	0.350	2300	3310	3310		3310	450		819	629	9.934
	40.50	NT-55LE	0.350	1590	3310	3310		3310	420		700	629	9.934
	40.50	NT-80LHE	0.350	2340	4820	4820		4820	590		934	915	9.934
	40.50	NT-80DE	0.350	1730	4820	4820		4820	597		964	915	9.934
	40.50	NT-80HE	0.350	2340	4820	4820		4820	597		964	915	9.934
	40.50	NT-80LE	0.350	1730	4820	4820		4820	590		934	915	9.934
	40.50	NT-95HE	0.350	2280	5720	5720		5720	696		1093	1086	9.934

Performance Properties and Dimensions

Size (in)	Weight (lbs/ft)	Grade	W.T. (in)	Collapse (psi)	Min. Internal Yield Pressure (psi)				Joint Strength (1,000 lbs)			PBYS (1,000 lbs)	Drift D. (in)
					PE	STC	LTC	BTC	STC	LTC	BTC		
10 3/4	45.50	J-55	0.400	2090	3580	3580		3580	493		796	715	9.794
	45.50	NT-55LHE	0.400	3090	3790	3790		3790	493		796	715	9.875
	45.50	K-55	0.400	2090	3580	3580		3580	528		931	715	9.794
	45.50	NT-55HE	0.400	3280	3790	3790		3790	528		931	715	9.875
	45.50	NT-55LE	0.400	2090	3790	3790		3790	493		796	715	9.875
	45.50	NT-80LHE	0.400	3390	5510	5510		5510	692		1063	1040	9.875
	45.50	NT-80DE	0.400	2480	5510	5510		5510	701		1097	1040	9.875
	45.50	NT-80HE	0.400	3390	5510	5510		5510	701		1097	1040	9.875
	45.50	NT-80LE	0.400	2480	5510	5510		5510	692		1063	1040	9.875
	45.50	NT-95HE	0.400	3380	6540	6540		6540	817		1243	1236	9.875
	51.00	J-55	0.450	2710	4030	4030		4030	565		891	801	9.694
	51.00	NT-55LHE	0.450	3870	4260	4260		4260	565		891	801	9.734
	51.00	K-55	0.450	2710	4030	4030		4030	606		1043	801	9.694
	51.00	NT-55HE	0.450	4280	4260	4260		4260	606		1043	801	9.734
	51.00	NT-55LE	0.450	2710	4260	4260		4260	565		891	801	9.734
	51.00	L-80	0.450	3220	5860	5860		5860	794		1190	1165	9.694
	51.00	N-80	0.450	3220	5860	5860		5860	804		1228	1165	9.694
	51.00	NT-80LHE	0.450	4550	6200	6200		6200	794		1190	1165	9.734
	51.00	NT-80DE	0.450	3220	6200	6200		6200	804		1228	1165	9.734
	51.00	NT-80HE	0.450	4550	6200	6200		6200	804		1228	1165	9.734
	51.00	NT-80LE	0.450	3220	6200	6200		6200	794		1190	1165	9.734
	51.00	NT-95HE	0.450	4750	7360	6880		7360	937		1392	1383	9.734
	55.50	NT-55LHE	0.495	4480	4690	4690		4690	630		976	877	9.625
	55.50	NT-55HE	0.495	5090	4690	4690		4690	675		1142	877	9.625
	55.50	NT-55LE	0.495	3390	4690	4690		4690	630		976	877	9.625
	55.50	L-80	0.495	4020	6450	6450		6450	884		1303	1276	9.604
	55.50	N-80	0.495	4020	6450	6450		6450	895		1345	1276	9.604
	55.50	NT-80LHE	0.495	5560	6810	6810		6810	884		1303	1276	9.625
	55.50	NT-80DE	0.495	4020	6810	6810		6810	895		1345	1276	9.625
	55.50	NT-80HE	0.495	5560	6810	6810		6810	895		1345	1276	9.625
	55.50	NT-80LE	0.495	4020	6810	6810		6810	884		1303	1276	9.625
	55.50	NT-95HE	0.495	6150	8090	6880		7450	1043		1524	1515	9.625
	60.70	NT-55LHE	0.545	5090	5160	5160		5160	700		1070	961	9.544
	60.70	NT-55HE	0.545	5880	5160	5160		5160	751		1251	961	9.544
	60.70	NT-55LE	0.545	4160	5160	5160		5160	700		1070	961	9.544
	60.70	NT-80LHE	0.545	6580	7500	6880		7450	983		1428	1398	9.544
	60.70	NT-80DE	0.545	5160	7500	6880		7450	996		1473	1398	9.544
	60.70	NT-80HE	0.545	6580	7500	6880		7450	996		1473	1398	9.544
	60.70	NT-80LE	0.545	5160	7500	6880		7450	983		1428	1398	9.544
	60.70	NT-95HE	0.545	7740	8910	6880		7450	1161		1670	1660	9.544
11 3/4	42.00	H-40	0.333	1040	1980	1980			307			478	10.928
	42.00	NT-55LHE	0.333	1520	2880	2880		2880	412		719	657	11.000
	42.00	NT-55HE	0.333	1540	2880	2880		2880	440		834	657	11.000
	42.00	NT-55LE	0.333	1120	2880	2880			412			657	11.000
	42.00	NT-80LHE	0.333	1560	4190	4190		4190	580		966	956	11.000
	42.00	NT-80DE	0.333	1130	4190	4190			587			956	11.000
	42.00	NT-80HE	0.333	1560	4190	4190		4190	587		994	956	11.000
	42.00	NT-80LE	0.333	1130	4190	4190			580			956	11.000
	42.00	NT-95HE	0.333	1500	4980	4980		4980	685		1131	1135	11.000
	47.00	J-55	0.375	1510	3070	3070		3070	477		807	737	10.844
	47.00	NT-55LHE	0.375	2120	3250	3250		3250	477		807	737	10.884
	47.00	K-55	0.375	1510	3070	3070		3070	509		935	737	10.844
	47.00	NT-55HE	0.375	2170	3250	3250		3250	509		935	737	10.884
	47.00	NT-55LE	0.375	1510	3250	3250		3250	477		807	737	10.884
	47.00	NT-80LHE	0.375	2210	4720	4720		4720	670		1084	1072	10.884
	47.00	NT-80DE	0.375	1630	4720	4720		4720	678		1116	1072	10.884
	47.00	NT-80HE	0.375	2210	4720	4720		4720	678		1116	1072	10.884
	47.00	NT-80LE	0.375	1630	4720	4720		4720	670		1084	1072	10.884
	47.00	NT-95HE	0.375	2140	5610	5610		5610	791		1269	1273	10.884
	54.00	J-55	0.435	2070	3560	3560		3560	568		931	850	10.724
	54.00	NT-55LHE	0.435	3060	3770	3770		3770	568		931	850	10.764
	54.00	K-55	0.435	2070	3560	3560		3560	606		1079	850	10.724
	54.00	NT-55HE	0.435	3240	3770	3770		3770	606		1079	850	10.764
	54.00	NT-55LE	0.435	2070	3770	3770		3770	568		931	850	10.764
	54.00	NT-80LHE	0.435	3350	5480	5480		5480	798		1250	1237	10.764
	54.00	NT-80DE	0.435	2450	5480	5480		5480	808		1287	1237	10.764
	54.00	NT-80HE	0.435	3350	5480	5480		5480	808		1287	1237	10.764
	54.00	NT-80LE	0.435	2450	5480	5480		5480	798		1250	1237	10.764
	54.00	NT-95HE	0.435	3330	6510	5820		6300	943		1464	1469	10.764

Size (in)	Weight (lbs/ft)	Grade	W.T. (in)	Collapse (psi)	Min. Internal Yield Pressure (psi)				Joint Strength (1,000 lbs)			PBYS (1,000 lbs)	Drift D. (in)
					PE	STC	LTC	BTC	STC	LTC	BTC		
11 3/4	60.00	J-55	0.489	2670	4010	4010		4010	649		1042	951	10.616
	60.00	NT-55LHE	0.489	3840	4230	4230		4230	649		1042	951	10.625
	60.00	K-55	0.489	2670	4010	4010		4010	693		1208	951	10.616
	60.00	NT-55HE	0.489	4230	4230	4230		4230	693		1208	951	10.625
	60.00	NT-55LE	0.489	2670	4230	4230		4230	649		1042	951	10.625
	60.00	L-80	0.489	3180	5830	5820		5830	913		1399	1384	10.616
	60.00	N-80	0.489	3180	5830	5820		5830	924		1440	1384	10.616
	60.00	NT-80LHE	0.489	4490	6160	5820		6160	913		1399	1384	10.625
	60.00	NT-80DE	0.489	3180	6160	5820		6160	924		1440	1384	10.625
	60.00	NT-80HE	0.489	4490	6160	5820		6160	924		1440	1384	10.625
	60.00	NT-80LE	0.489	3180	6160	5820		6160	913		1399	1384	10.625
	60.00	NT-95HE	0.489	4670	7310	5820		6300	1078		1638	1643	10.625
13 3/8	48.00	H-40	0.330	740	1730	1730			322			541	12.559
	48.00	NT-55LHE	0.330	1020	2510	2510		2510	433		793	744	12.599
	48.00	NT-55HE	0.330	1030	2510	2510		2510	460		904	744	12.599
	48.00	NT-55LE	0.330	740	2510	2510			433			744	12.599
	48.00	NT-80LHE	0.330	1040	3650	3650		3650	610		1075	1082	12.599
	48.00	NT-80DE	0.330	740	3650	3650			617			1082	12.599
	48.00	NT-80HE	0.330	1040	3650	3650		3650	617		1102	1082	12.599
	48.00	NT-80LE	0.330	740	3650	3650			610			1082	12.599
	48.00	NT-95HE	0.330	1000	4340	4340		4340	720		1260	1285	12.599
	54.50	J-55	0.380	1130	2730	2730		2730	514		909	853	12.459
	54.50	NT-55LHE	0.380	1530	2890	2890		2890	514		909	853	12.499
	54.50	K-55	0.380	1130	2730	2730		2730	547		1038	853	12.459
	54.50	NT-55HE	0.380	1550	2890	2890		2890	547		1038	853	12.499
	54.50	NT-55LE	0.380	1130	2890	2890		2890	514		909	853	12.499
	54.50	NT-80LHE	0.380	1570	4200	4200		4200	725		1233	1241	12.499
	54.50	NT-80DE	0.380	1140	4200	4200		4200	733		1265	1241	12.499
	54.50	NT-80HE	0.380	1570	4200	4200		4200	733		1265	1241	12.499
	54.50	NT-80LE	0.380	1140	4200	4200		4200	725		1233	1241	12.499
	54.50	NT-95HE	0.380	1510	4990	4550		4930	856		1446	1474	12.499
	61.00	J-55	0.430	1540	3090	3090		3090	595		1025	962	12.359
	61.00	NT-55LHE	0.430	2160	3270	3270		3270	595		1025	962	12.399
	61.00	K-55	0.430	1540	3090	3090		3090	633		1170	962	12.359
	61.00	NT-55HE	0.430	2220	3270	3270		3270	633		1170	962	12.399
	61.00	NT-55LE	0.430	1540	3270	3270		3270	595		1025	962	12.399
	61.00	NT-80LHE	0.430	2260	4760	4550		4760	839		1389	1399	12.399
	61.00	NT-80DE	0.430	1670	4760	4550		4760	849		1426	1399	12.399
	61.00	NT-80HE	0.430	2260	4760	4550		4760	849		1426	1399	12.399
	61.00	NT-80LE	0.430	1670	4760	4550		4760	839		1389	1399	12.399
	61.00	NT-95HE	0.430	2190	5650	4550		4930	991		1630	1661	12.399
	68.00	J-55	0.480	1950	3450	3450		3450	675		1140	1069	12.259
	68.00	NT-55LHE	0.480	2850	3650	3650		3650	675		1140	1069	12.299
	68.00	K-55	0.480	1950	3450	3450		3450	718		1300	1069	12.259
	68.00	NT-55HE	0.480	2990	3650	3650		3650	718		1300	1069	12.299
	68.00	NT-55LE	0.480	1950	3650	3650		3650	675		1140	1069	12.299
	68.00	L-80	0.480	2260	5020	4550		4930	952		1545	1556	12.259
	68.00	N-80	0.480	2260	5020	4550		4930	963		1585	1556	12.259
	68.00	NT-80LHE	0.480	3080	5310	4550		4930	952		1545	1556	12.299
	68.00	NT-80DE	0.480	2260	5310	4550		4930	963		1585	1556	12.299
	68.00	NT-80HE	0.480	3080	5310	4550		4930	963		1585	1556	12.299
	68.00	NT-80LE	0.480	2260	5310	4550		4930	952		1545	1556	12.299
	68.00	NT-95HE	0.480	3040	6310	4550		4930	1125		1812	1847	12.299
	72.00	NT-55LHE	0.514	3310	3910	3910		3910	730		1217	1142	12.250
	72.00	NT-55HE	0.514	3550	3910	3910		3910	776		1389	1142	12.250
	72.00	NT-55LE	0.514	2220	3910	3910		3910	730		1217	1142	12.250
	72.00	L-80	0.514	2670	5380	4550		4930	1029		1650	1661	12.191
	72.00	N-80	0.514	2670	5380	4550		4930	1040		1693	1661	12.191
	72.00	NT-80LHE	0.514	3700	5690	4550		4930	1029		1650	1661	12.250
	72.00	NT-80DE	0.514	2670	5690	4550		4930	1040		1693	1661	12.250
	72.00	NT-80HE	0.514	3700	5690	4550		4930	1040		1693	1661	12.250
	72.00	NT-80LE	0.514	2670	5690	4550		4930	1029		1650	1661	12.250
	72.00	NT-95HE	0.514	3720	6750	4550		4930	1215		1935	1973	12.250

Performance Properties and Dimensions

Size (in)	Weight (lbs/ft)	Grade	W.T. (in)	Collapse (psi)	Min. Internal Yield Pressure (psi)				Joint Strength (1,000 lbs)			PBYS (1,000 lbs)	Drift D. (in)
					PE	STC	LTC	BTC	STC	LTC	BTC		
16	65.00	H-40	0.375	630	1640	1640			439		439	736	15.062
	65.00	NT-80DE	0.375	630	3470	3230			843		843	1473	15.062
	75.00	J-55	0.438	1020	2630	2630		2630	710		710	1178	14.938
	75.00	K-55	0.438	1020	2630	2630		2630	752		752	1178	14.938
	75.00	NT-80DE	0.438	1020	4050	3230		3560	1014		1014	1713	14.938
	84.00	J-55	0.495	1410	2980	2980		2980	817		817	1326	14.822
	84.00	K-55	0.495	1410	2980	2980		2980	865		865	1326	14.822
	84.00	NT-80DE	0.495	1480	4580	3230		3560	1167		1167	1929	14.822
	94.50	NT-80DE	0.562	2140	5200	3230		3560	1346		1346	2181	14.689
18⅝	87.50	H-40	0.435	630	1630	1630			559			994	17.567
	87.50	J-55	0.435	630	2250	2250		2250	754		1329	1367	17.567
	87.50	K-55	0.435	630	2250	2250		2250	794		1427	1367	17.567
	87.50	NT-80DE	0.435	630	3460	3150		3460	1079		1888	1989	17.567
	94.50	NT-80DE	0.468	780	3720	3150		3500	1174		2027	2136	17.501
	96.50	NT-80DE	0.486	880	3860	3150		3500	1226		2103	2216	17.465
	106.00	NT-80DE	0.531	1150	4220	3150		3500	1356		2292	2415	17.375
	109.35	NT-80DE	0.563	1380	4470	3150		3500	1448		2426	2556	17.311
	112.00	NT-80DE	0.579	1500	4600	3150		3500	1494		2492	2626	17.279
	115.00	NT-80DE	0.594	1630	4720	3150		3500	1536		2555	2692	17.249
	122.00	NT-80DE	0.636	1980	5050	3150		3500	1656		2729	2875	17.165
20	94.00	H-40	0.438	520	1530	1530	1530		581	673		1077	18.936
	94.00	J-55	0.438	520	2110	2110	2110	2110	783	907	1402	1480	18.936
	94.00	K-55	0.438	520	2110	2110	2110	2110	823	955	1479	1480	18.936
	94.00	NT-80DE	0.438	520	3240	2410	2410	2320	1122	1297	2004	2153	18.936
	106.50	J-55	0.500	770	2410	2410	2410	2320	913	1056	1595	1685	18.812
	106.50	K-55	0.500	770	2410	2410	2410	2320	959	1113	1683	1685	18.812
	106.50	NT-80DE	0.500	770	3700	2410	2410	2320	1306	1511	2281	2450	18.812
	117.00	NT-80DE	0.563	1110	4170	2410	2410	2320	1494	1728	2560	2750	18.686
	133.00	J-55	0.635	1500	3060	2410	2410	2320	1192	1379	2012	2125	18.542
	133.00	K-55	0.635	1500	3060	2410	2410	2320	1252	1453	2123	2125	18.542
	133.00	NT-80DE	0.635	1600	4700	2410	2410	2320	1706	1973	2877	3091	18.542

The Pipe Mills of Nippon Steel

Nippon Steel's Pipe Making Facilities and Product Size

Mills			Location of Mills	Size: Outside Diameter (in)
				1 2 4 6 8 10 12 14 16 20 56 200
HF-ERW	24″ HF-ERW	Thermatool	Hikari	8.625 – 24
	16″ HF-ERW	Thermatool or Induction	Nagoya	4.500 – 16
	4″ HF-ERW + Stretch Reducer	Induction	Hikari	(Pipe In Coil) 0.413 – 1.681
	4″ HF-ERW (2 mills)	Induction	Nagoya	1.492 – 4.500
	4″ HF-ERW	Induction	Kimitsu	0.750 – 4.500
	2″ HF-ERW (2 mills)	Induction	Nagoya	0.850 – 2.559
CW	Continuous Butt Weld		Kimitsu	0.840 – 4.500
Seam-less	Mannesmann-Plug Mill Stretch Reducer	Hot Fin.	Tokyo	1.315 – 6.625
		Cold Fin.		0.236 – 6.000
	Ugine-Sejournet Hot Extrusion	Hot Fin.	Hikari	1.660 – 6.625
		Cold Fin.		0.236 – 5.500
SAW	UO Process Longitudinal Weld		Kimitsu	18 – 56
	Spiral Weld (1 mills)		Yawata	16 – 64
	Spiral Weld (2 mills)		Kimitsu	16 – 100
	Bending Roll Process Longitudinal Weld (4 mills)		Subsidiary Company	16 – 200
TIG	Tungsten Inert-Gas Weld	Hot Fin.	Hikari	1.050 – 2.375
		Cold Fin.		0.236 – 2.248