

Longitudinal DSAW Pipe

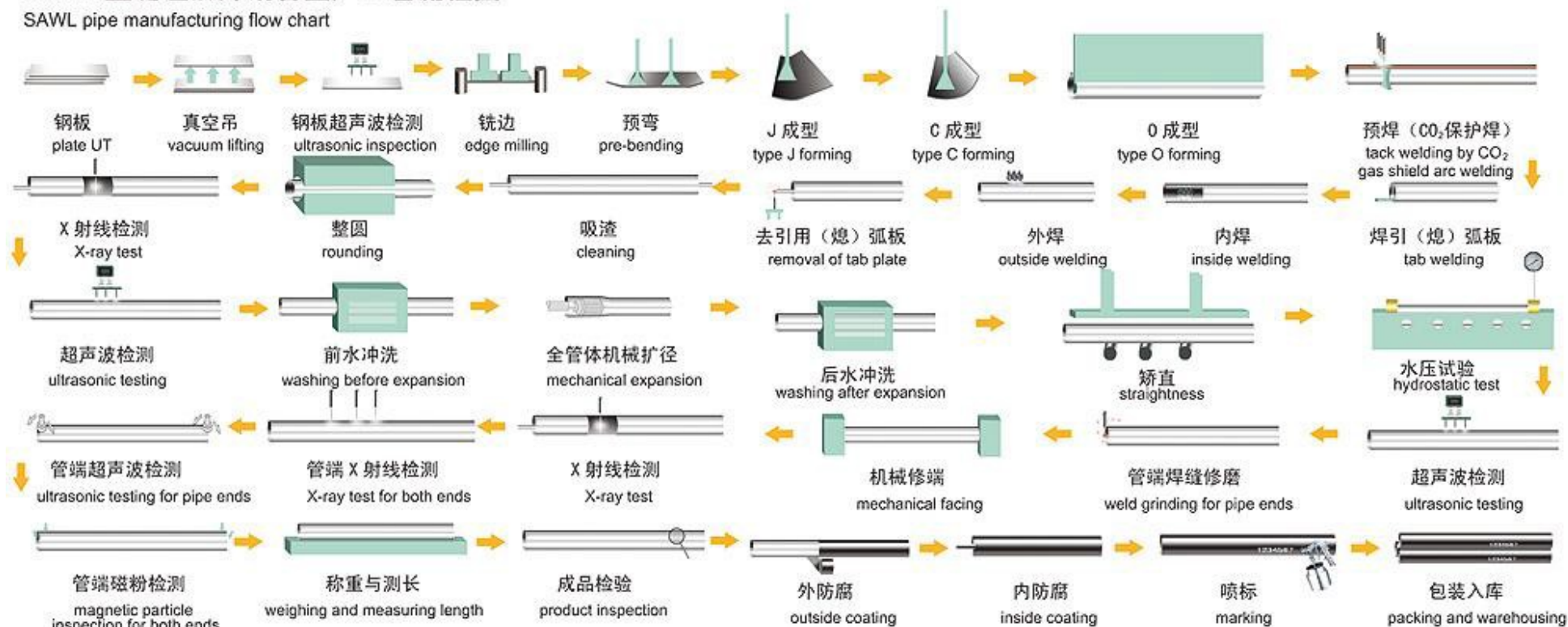
The high-intensity, high-quality large diameter DSAW/LSAW pipes for oil and natural gas delivery and pipes for other purposes are produced in line with API5L, ISO3183, DNF OS-F101, AS 2885-1 standards and additional technical requirements and

材料等级: X90~X120 ; X70 , X80 X65 及以下

外径		壁 厚(mm)																													
Inch	mm	6.4	7.9	8.7	9.5	10.3	11.1	11.9	12.7	14.3	15.9	17.5	19.1	20.6	22.2	23.8	25.4	27.0	28.6	30.2	31.8	33.3	34.9	38	40	42	44	46	48	50	60
16	406.4																														
18	457.2																														
20	508.0																														
22	558.8																														
24	609.6																														
26	660.4																														
28	711.2																														
30	762.0																														
32	812.8																														
34	863.6																														
36	914.4																														
38	965.2																														
40	1016.0																														
42	1066.8																														
44	1117.6																														
46	1168.4																														
48	1219.2																														
52	1320.8																														
56	1422.4																														

Single Pipe Length can be 6-18m (20'-60')

SAWL pipe manufacturing flow chart











3-Roller Bending SAW Pipe

For the formed short pipe section, tack welding is firstly carried out by CO₂ shielded arc welding, heating treatment before welding, and then internal straight welding, external straight welding, internal girth welding, and external girth welding are conducted with single wire, multi-layer and multi-pass welding. After completion of welding, the weld seam is heat preserved to reduce the weld residual stress and increase the property of stress corrosion resistance of metal. The characteristic of the production line is the wall thickness and diameter of product is large, which can be widely used for structural pipe, such as steel structural bridge, high-voltage transmission tower, sea and land wind tower, offshore platform equipment and super-long pipe piles etc.



Size Available

Diameter	Inch	16	18	20	22	24	26	28	30	32	34	36	38	40	44	48	50	54	60	64	68	72	80	88	96	104	112	120	140	160	180	200
Wall Thickness (mm)	120																															
	115																															
	110																															
	105																															
	100																															
	95																															
	90																															
	85																															
	80																															
	76																															
	72																															
	68																															
	64																															
	60																															
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	52																															
	48																															
	44																															
	40																															
	36																															
32																																
28																																
22																																
Based on nominal Yield Strength of 355Mpa																																



Spiral Submerged Arc Welded Pipe

With first-class welding pipe production line and equipment, it provides the most competitive series of pipe products for international oil and gas markets and takes the lead in the industry. Products are primarily used in oil and natural gas delivery, tap water, sewerage, and heat supply network transformation, as well as in piling, bridge, and steel structure.

Process Flowchart



SPIRAL WELDED PIPE MILL LINE





Unfolding



Submerged Arc Welding



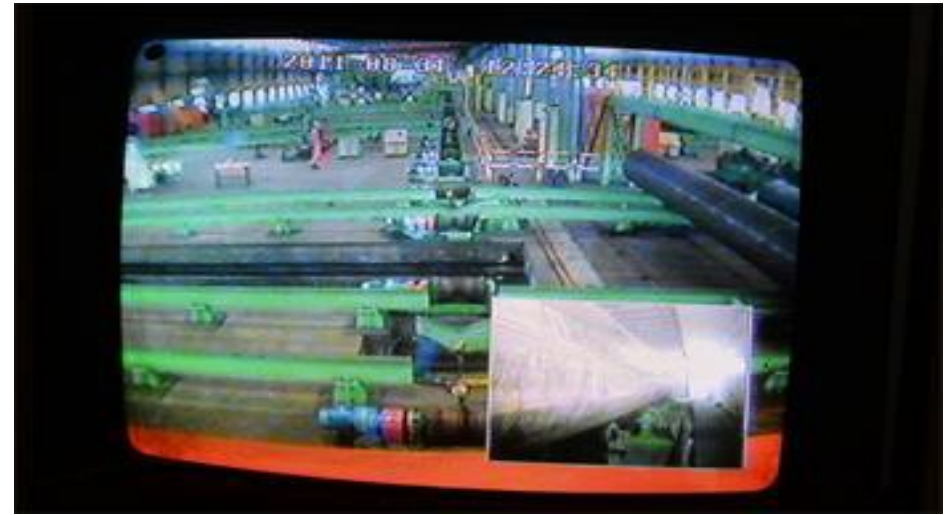
Pipe End X-Ray



Pipe End X-Ray



X-ray Inspection of Industrial Television



X-ray Inspection of Industrial Television



Hydrostatic Pressure Test



Hydrostatic Pressure Test



Continuous Ultrasonic Flaw Detection



Continuous Ultrasonic Flaw Detection



Continuous Ultrasonic Flaw Detection



Continuous Monitoring Equipment of Ultrasonic Flaw Detection



Continuous Monitoring Equipment of Ultrasonic Flaw Detection



Manual Ultrasonic Flaw Detection



Inspection of Pipe end Diameter



Cleavage Angle Inspection

[illegible]

72"	1,820																		
76"	1,920																		
80"	2,032																		
84"	2,100																		
88"	2,200																		
92"	2,337																		
96"	2,438																		
100"	2,540																		
104"	2,642																		
108"	2,743																		
110"	2,794																		
112"	2,845																		
116"	2,946																		
120"	3,048																		

We can supply the length from 6 meters up to 80 meters



FLANGED SPIRAL WELDED PIPE



PIPE PILING WITH DRIVING SHOES



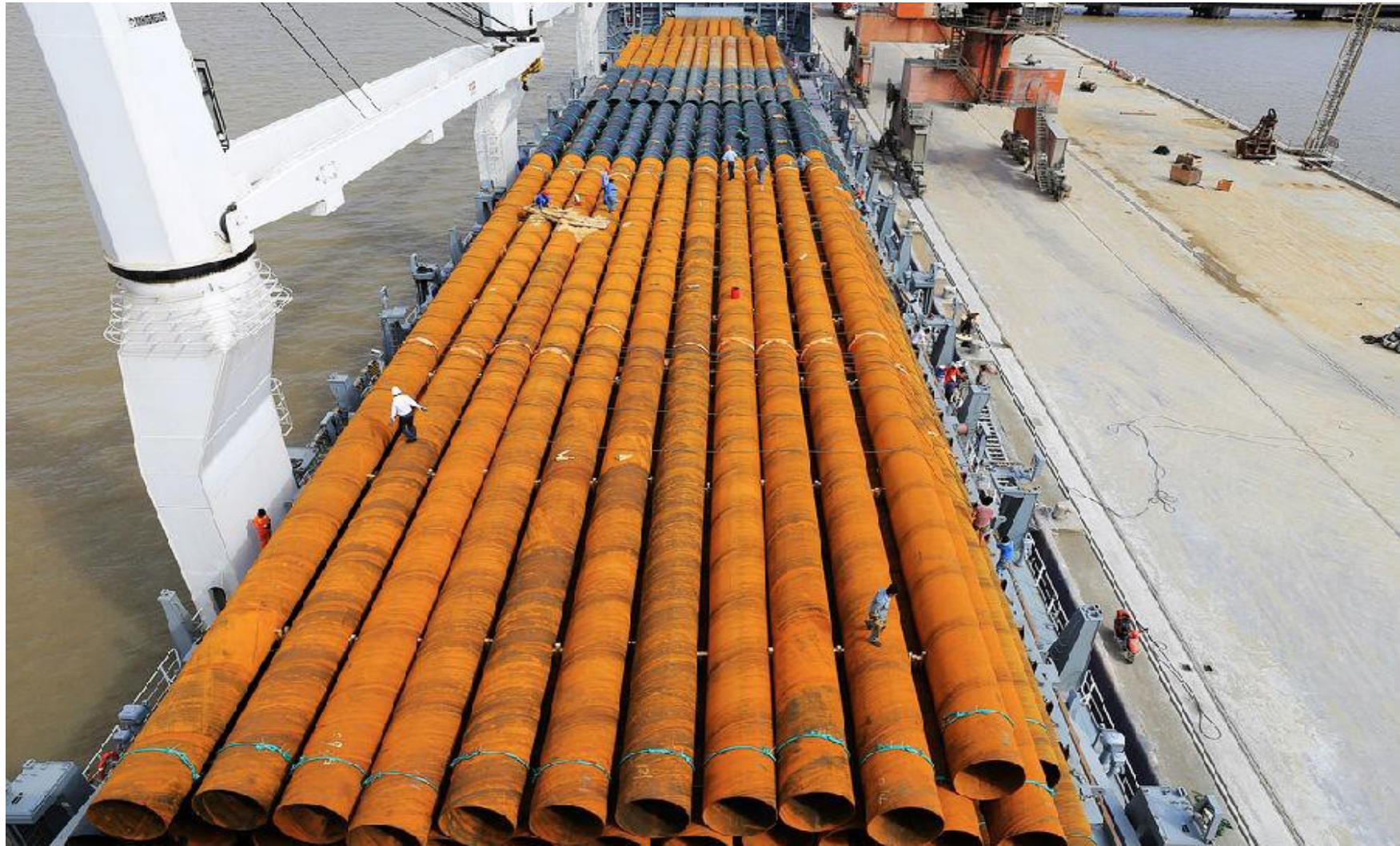
AS1163 C350L0 STUBBED PIPE PILING



TRUCK TRANSPORTED EXTRA LENGTH PIPE PILING



3LPE COATED EXTRA LENGTH PIPE PILING

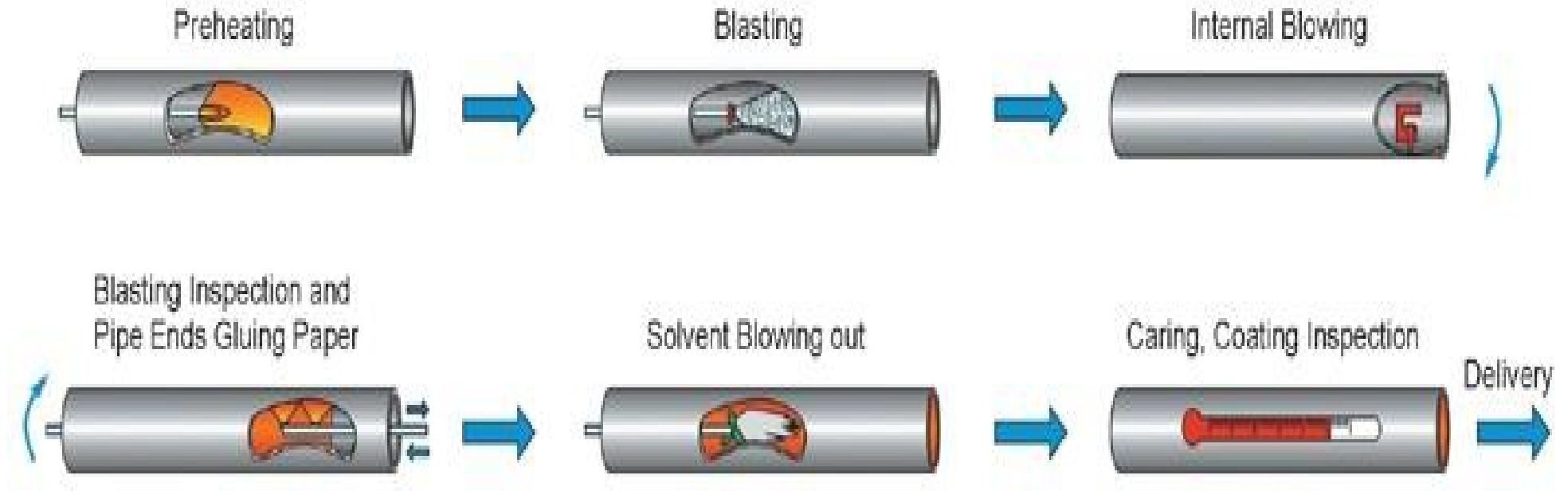


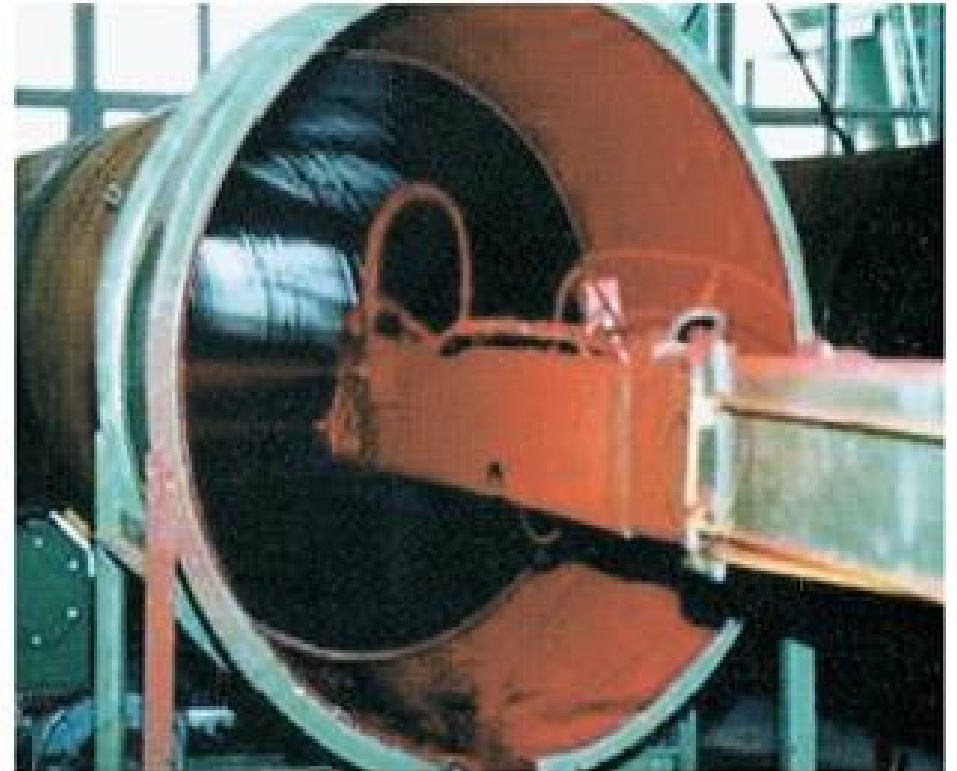
SUPER LENGTH PIPE PILING LOADED INTO M.V.

Anti-Corrosion Coating

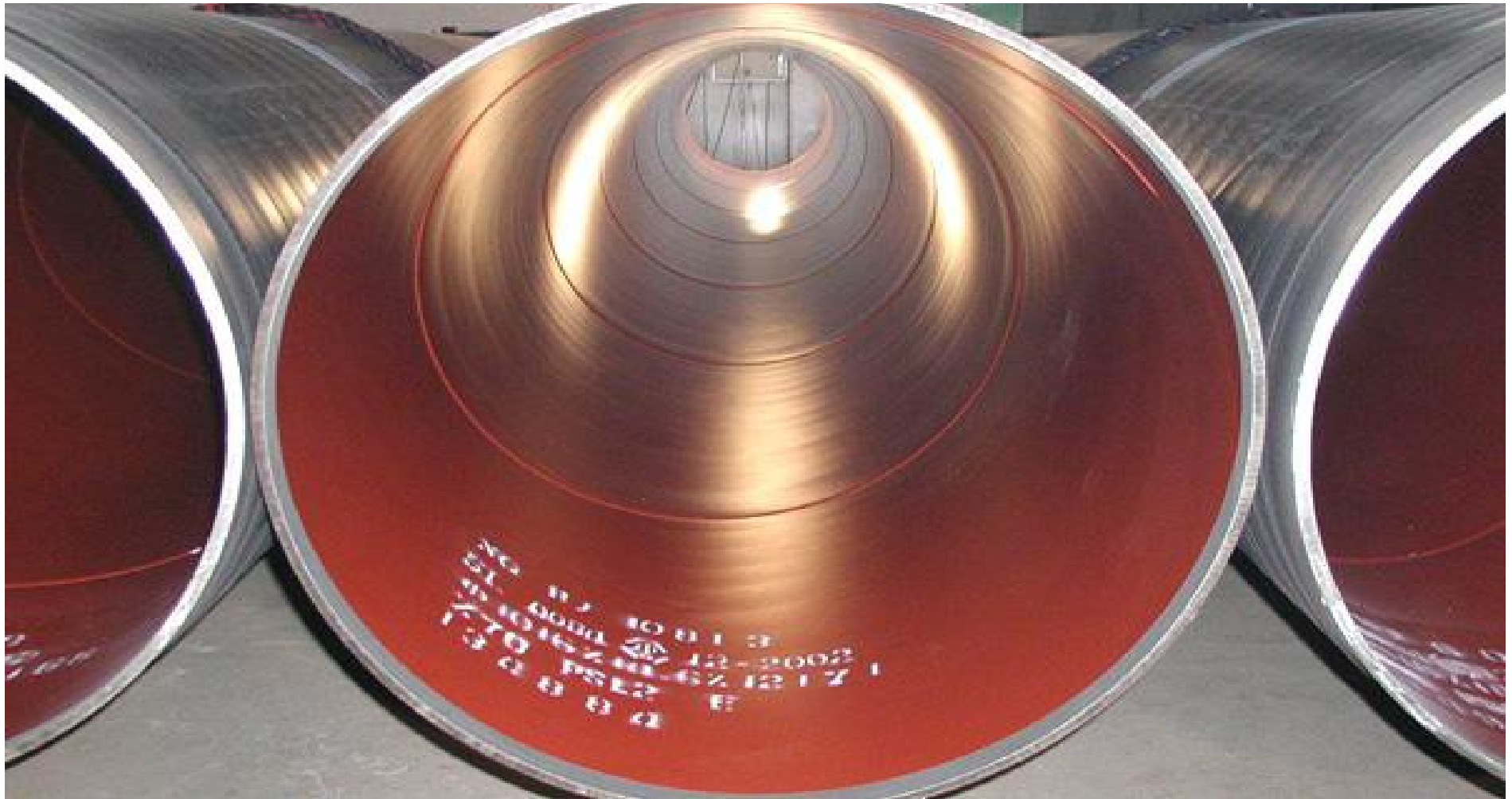
Internal Liquid Epoxy Coating

Epoxy coating system is preferred for lining pipe internal surfaces for potable water pipelines in order to protect steel surface from corrosion. This application uses a two-part liquid epoxy paint system which is applied in a single coat as anticorrosion protection for steel pipes. The first process the pipes go through are cleaning & blasting. Then liquid epoxy is applied to the pipes inner surface by spray guns in a bogey, forming a uniform single layer epoxy which cure after application. Special grade of liquid epoxy is also applied for gas pipes in order to reduce the back pressure created by roughness of the internal pipe surface.





Internal Coating



LIQUID EPOXY LINING+3LPE COATING



F

LIQUID EPOXY LINING+DOUBLE LAYER FBE COATING

FBE/2FBE External/3LPE COATING

Fusion Bond Epoxy is a powder epoxy thermosetting coating applied for anticorrosion protection to steel pipelines. The pipe is first blast cleaned and heated. Then epoxy powder is spray applied by electrostatic guns to melt and form a uniform layer that hardens within a minute from application. Utilizing industry accepted materials supplied by manufacturers such as 3M, DuPont, and Valspar, the facility can apply FBE in a wide range of thickness to cost effectively meet any project specifications.

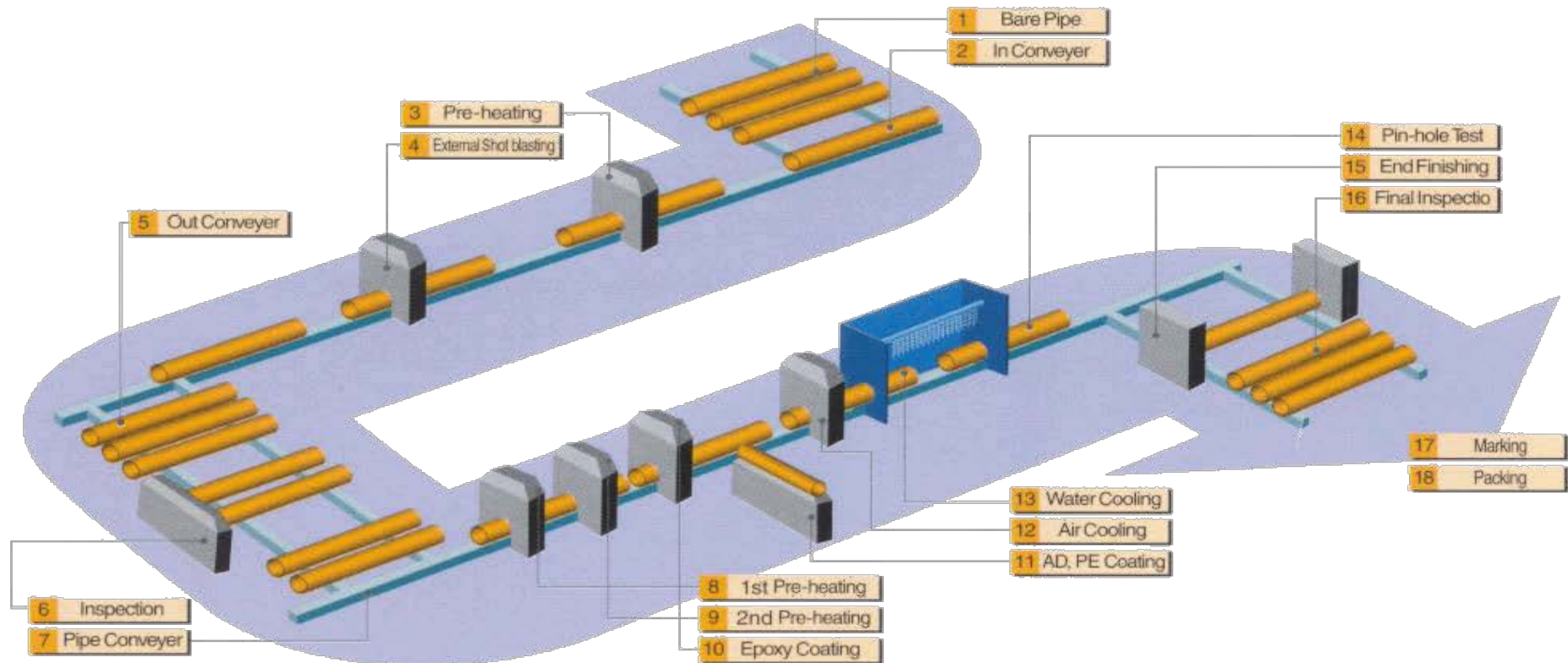
Fusion Bonded Epoxy with Abrasion Resistance Overcoating (FBE/ARO) – Utilizing two completely separate powder systems, the facility can produce FBE with an ARO at unprecedented processing speeds using industry accepted materials such as 3M 6352, DuPont 7-2610, and Lilly 2040.

Fusion Bonded Epoxy with High Temperature Resistant Overcoating – Utilizing two completely separate powder systems, the facility can produce FBE with a high operating temperature resistant overcoating such as DuPont's Nap-Gard Gold and 3M's 6258.

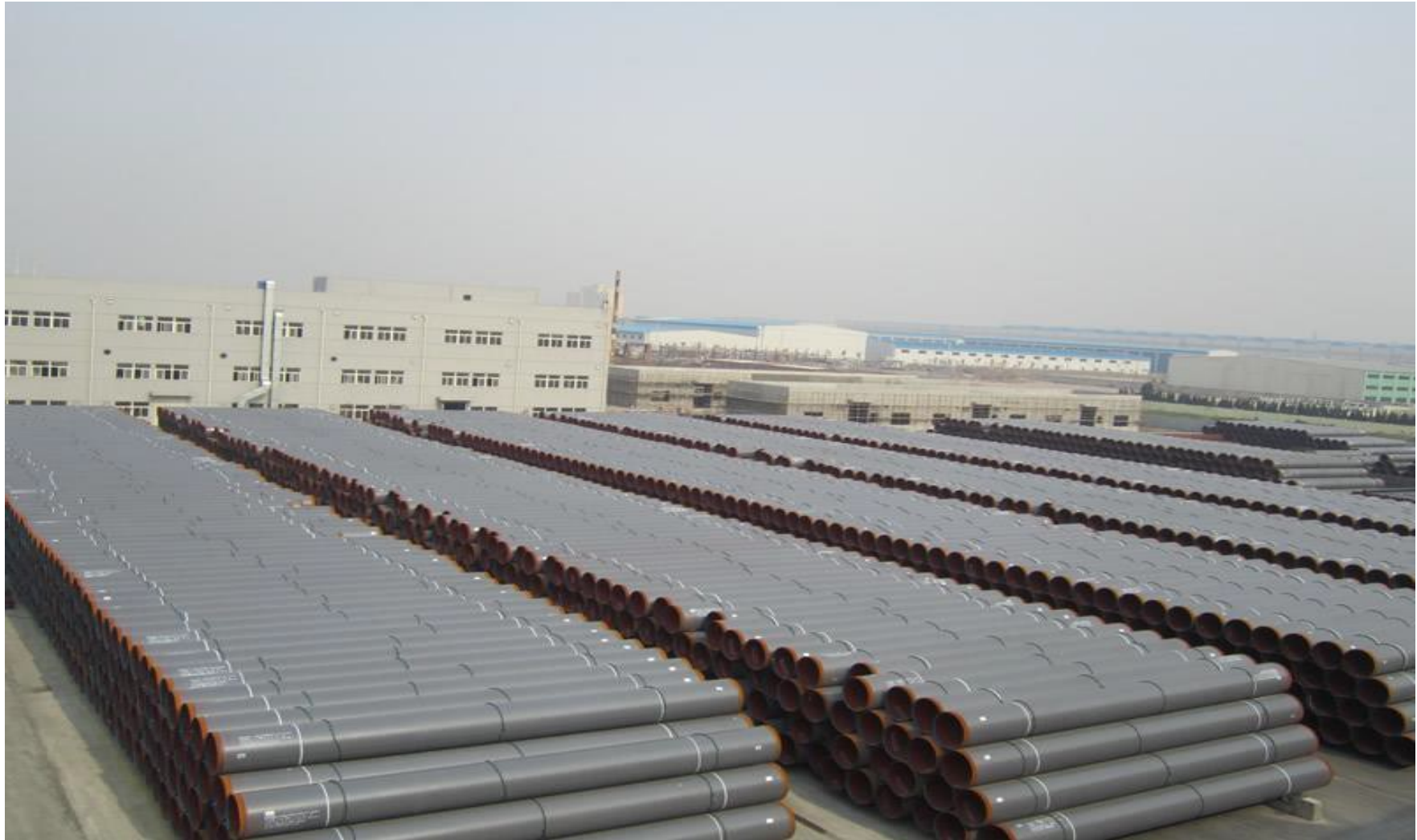
For more severe abrasive & temperature conditions, Dual Layer FBE should be applied. Dual layer FBE is a dual powder abrasion resistant coating which is designed to provide excellent abrasion resistance to the pipes.

To improve anticorrosion performance and adhesion, an additional layer of epoxy primer is sprayed onto pipe surfaces prior to the adhesive layer and Polyethylene top layer application. Three Layer Polyethylene is suitable for service temperatures from 60°C to 80°C (85°C peaks). Typical coating thickness is from 1-2 mm to 3-5 mm.

FBE/3LPE Coating Process Flowchart



Principle Structure of Typical Plant



DOUBLE LAYER FBE COATING



YELLOW JACKETED 3LPE COATING



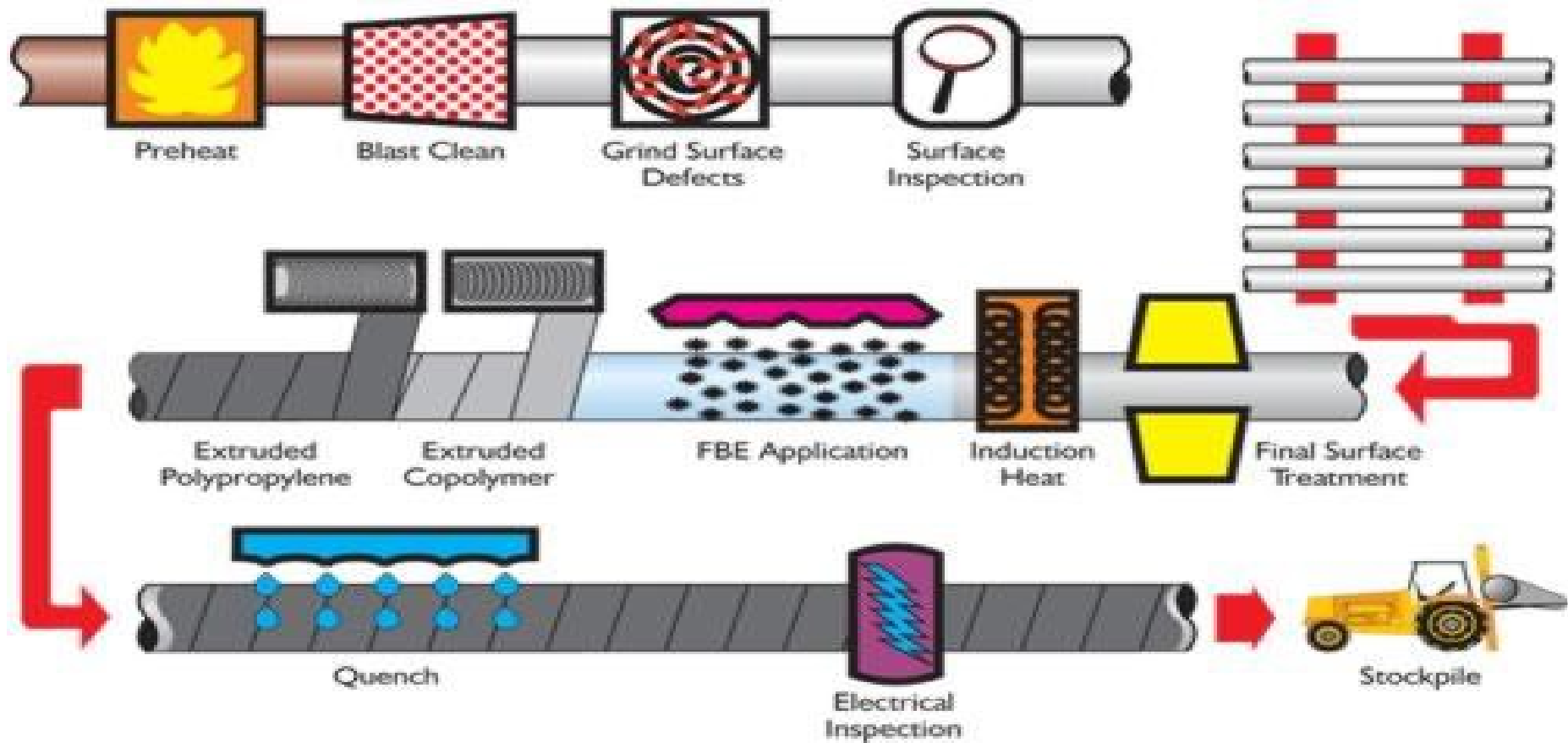
BLACK 3LPE COATING



3-LAYER POLETHYLENE COATING

3 Layer Polypropylene Coating Process Flowchart

If a wider service temperature range and high stiffness is required, adhesive and top layers, applied over primer layer, are based on polypropylene instead of polyethylene. Three Layer Polypropylene is suitable for service temperatures up to 135 °C (140°C peaks). Typical coating thickness is from 1-2 mm to 3-5 mm.









Pipe Coating Line

Concrete Weighted Coating





Inspection & Testing



Tensile Test (Microcomputer-controlled Electro-hydraulic Servo Universal Testing Machine)



Tensile Test (30-ton Electronic Universal Testing Machine)



Impact Test (500J Impact Testing Machine)



Drop Weight Tear Test (Drop Weight Tear Testing Machine)



Spectrographic Analysis Test (Direct-reading Spectrometer)





Hardness Test (Small-load Vicker Hardness Testing Machine)



Nitrogen Test (Oxygen/Nitrogen Determination)





Technical Specification

1. Steel Pipe

1.1 Line Pipe

API 5L PSL1/PSL 2	Line Pipe: Gr. B X42, X46, X52, X56, X60, X65, X70, X80/BM.X42M,X46M,X52M,X60M,X65M,X70,X80M
ISO 3183-1/2	Petroleum and Natural Gas Industries-Steel Pipe for Pipelines-L240M,L290M,L320M,L360M,L390M,L415M,L450M,L485M,L555M,L690M
ISO 3183-3	Petroleum and Natural Gas Industries Steel Pipe for Pipelines-L245NC / L245NCS,L290NC / L290NCS, L360NC / L360NCS, L290MC / L290MCS, L360MC / L360MCS, L415MC / L415MCS, L450MC / L450MCS, L485MC / L485MCS, L555MC
AS 2885-1	Pipelines-Gas and liquid petroleum Part 1: Design and Construction
CSA Z245.1	Steel Pipe-241,290,359,386,414,448,483,550,620,690,825
DIN 2470-1	Steel gas pipelines for permissible service pressures up to 16 bar
DIN 2470-2	Steel gas pipelines for permissible service pressures exceeding 16 bar
DIN 17172	Steel pipes for pipelines for the transport of combustion fluids and gases--DIN 2470 Part II St. E210-7, E240-7,E290-7, St. E 320-7,St.E 360-7
EN 10208-1:2009(TS 6047)	Steel pipes for pipelines for combustible fluids - Technical delivery conditions - Part 1: Pipes of requirement class A-L210GA,L235GA,L245GA,L290GA, L360GA
EN 10208-2:2009,	Steel pipes for pipelines for combustible fluids – Technical delivery conditions – Part 2: Pipes of requirement class B-L245MB,L290MB,L320MB,L360MB,L390MB,L415MB,L450MB, L485MB,L555MB
EN 10208-3	Non alloy and alloy fine grain steel tubes
EN 10217-1/3	Welded steel tubes for pressure purposes
DEP 31.40.20.35-Gen	Line pipe for non-critical service (amendments/supplements to ISO 3183-1)
DEP 31.40.20.37-Gen	Line pipe for critical service (amendments/supplements to ISO 3183-3)
DEP 31.40.40.38-Gen	Hydrostatic pressure testing of new pipelines
DEP 31.40.20.35-Gen	Line pipe for non-critical service (amendments/supplements to ISO 3183-1)
DEP 31.40.60.11-Gen	Pipeline leak detection
DEP 31.40.60.12-Gen	Pipeline Repairs (supplements to ANSI/ASME B31.4 and B31.8)
DEP 61.40.20.30-Gen	Welding of pipelines and related facilities (amendments/supplements to ANSI/API STD 1104)
DEP 31.40.50.30-Gen	Precommissioning of pipelines

GOST 10705-80	Electrically welded tube for the construction of trunk oil pipelines (426-1620mm)
GOST 20295	Welded Steel Pipes for Main Gas and Oil Pipelines--K34, K38, K42, K48, K50, K52, K54, K55, K56, K60,K65
GOST R 52079:2003	Specification for electric-welded steel pipe intended for conveying gas/oil and oil products
IPS-M-PI-190	Material And Equipment Standard for Line Pipe
KOC-MP-019	KOC Standard for Submerged-Arc Welded (SAW) Pipe to API 5L
KOC-MS-001 Part 1	Kuwait Material Specification Line Pipe for Sour Service
NACE MR 0175/ISO 15156-2	Petroleum and Natural Gas Industries – Materials for Use in H ₂ S Containing Environments in Oil and Gas Production. Part 2. Cracking resistant Carbon and Low Alloy Steels, and the Use of Cast Irons.
NACE TM 0177	Laboratory Testing of Metals for Resistance to Sulfide Stress Cracking in Hydrogen Sulfide (H ₂ S) Environments
NACE TM 0284	Standard Test Method - Evaluation of Pipeline and Pressure Vessel Steels for Resistance to Hydrogen-Induced Cracking
NFA 49-211/NFA 49-411	TUE 220,TUE 250,TUE 275,TUE 290,TUE 320,TUE 360,TUE 415,TUE 450
NRF-001-Pemex-2007	Steel Piping for Hydrocarbon Collections and Transportation/TUBERÍA DE ACERO PARA RECOLECCIÓN Y TRANSPORTE DE HIDROCARBUROS
RP 43-1	Onshore Transmission Pipelines to BS 8010
01-SAMSS-332/01-SAMSS-333	High frequency welded line pipe
01-SAMSS-035/01-SAMSS-038	Submerged-arc welded line pipe per
TOTAL-GS-EP-PLR-202	Fabrication of longitudinally submerged arc welded pipes for pipelines (sweet service)
TOTAL-GS-PLR-212 REV.04	Fabrication of Longitudinally Submerged Arc Welded Pipes for Pipelines (Intermediate and Sever Sour Service)

1.2 Mechanical Pipe,Pressure Pipe, Structural Pipe & Pipe Piles,etc

API 2B	Specification for the Fabrication of Structural Steel Pipe
ASTM A155	Electric Fusion Welded Steel Pipe for High Temperature Service
ASTM A134	Standard Specification for electric-fusion (arc)-welded straight seam or spiral seam steel pipe NPS 16 and over in diameter
ASTM A139	Standard Specification for Electric-Fusion(Arc)-Welded Steel Pipe (NPS 4 and over) straight-seam or helical-seam steel pipe.-Grade A,B,C,D,E.
ASTM A155	Electric Fusion Welded Steel Pipe for High Temperature Service
ASTM A252	Standard Specification for Welded and Seamless Steel Pipe Piles-GR.1/2/3
ASTM A381-96	Standard Specification for Metal-Arc-Welded Steel Pipe for Use with High-Pressure Transmission Systems
ASTM A500	Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

ASTM A671	Electric Fusion Welded Steel Pipe for Atmospheric and Lower Temperature
ASTM A672	Electric-fusion-welded steel pipe for high-pressure service at moderate temperatures
ASTM A691	Electric Fusion Welded Carbon and Alloy Steel Pipe for High Pressure Service at High Temperatures
AWWA C200-97	Steel Water Pipe-6 In. (150 mm) and Larger
AWWA C207-01	Steel Pipe Flanges for Waterworks Service- Sizes 4 In. Through 144 In. (100 mm Through 3,600 mm)
AS 1579	Arc-Welded Steel Pipes and Fittings for Water and Wastewater
AS/NZS 1163	Cold Formed Structural Steel Hollow Sections- C250/L0, C350/L0, C450/L0
AS 2159	Piling Design and Installation
AS 812	Bored Piles
BS 534	Specification for steel pipes, joints and specials for water and sewage
BS 3601	Steel Pipe and Tubes for Pressure Proposes Carbon Steel: Ordinary Duties- Gr. 360, Gr. 430,
BS 3602-2	Specification for steel pipes and tubes for pressure purposes: carbon and carbon manganese steel with specified elevated temperature properties. Part 2: Submerged arc welded tubes
BS 6323	Seamless and welded steel tubes for automobile mechanical and general engineering purposes. Part 1: General requirements. Part 7: Specific requirements for submerged arc welded steel tube
BS 7191	All Specification for Weldable Structure Steels for Fixed Offshore Structures
DIN 1615	Welded circular tubes of non-alloy steel without special quality requirements.
DIN 1626	Welded circular tubes of non-alloy steel with special quality requirements- St. 37.0, St. 44.0, St. 52.0
DIN 1628	Welded circular tubes of non-alloy steel with very high quality requirements- St. 37.4
DIN 2458	Plain end welded steel tubes, dimensions and conventional masses per unit length- DIN 2470 Part 1 St. 37.0, St. 44.0, St. 52.0
DIN 2460	Steel tubes for waterworks services
DIN 17120	Welded structural steel circular tubes for structural engineering purposes
DIN 17172	Steel pipes for pipelines for the transport of combustion fluids and gases--DIN 2470 Part II St. E210-7, E240-7, E290-7, St. E 320-7, St. E 360-7
DIN 17174	Welded circular steel tubes for low temperatures
DIN 17177	Electric Pressure-welded Steel Tubes for Elevated Temperatures; Technical Conditions of Delivery- St. 37.8, St. 42.8
EN 10219-1/2	Cold formed welded structural hollow sections of non-alloy and fine grain steels. Part 1: Technical delivery requirements. Part 2: Dimensions
EN 10224	Steel pipes, joints and fittings for the conveyance of aqueous liquids including potable water
EN 10296-1	Welded steel tubes for mechanical and general engineering purposes – TDR. Part 1: Non alloy and alloy steel tubes

JIS A5525	Steel Pipe Pile
JIS G3444	Carbon Steel Tubes for General Structural Purpose- STK 90,400,490,500,540
JIS G3452	Carbon Steel Pipe for Ordinary Piping
JIS G 3457	Arc Welded Carbon Steel Pipe- STPY 400
KS D 3566	Carbon Steel Tubes for General Structural Purpose- STK 90,400,490,500,540
KS D 3583	Arc Welded Carbon Steel Pipe- SPW 400
KS F4602	Steel Pipes Piles
KS F4605	Steel Pipe Sheet Piles
NF A49-142-87	STEEL TUBES LONGITUDINALLY PRESSURE WELDED PLAIN ENDED AND HOT FINISHED TUBES
NF A49-150-85	STEEL TUBES WELDED TUBES INTENDED TO BE COATED OF PROTECTED FOR USE IN WATER PIPING SUSTEMS
NF A49-253-82	STEEL TUBES LONGITUDINALLY FUSION WELDED NON ALLOY AND FERRITIC ALLOY STEEL TUBES FOR USE AT ELEVATED TEMPERATURES
NF A49-402-88	STEEL TUBES SPIRAL FUSION WELDED NOW\N ALLOY AND MICRO ALLOY STEEL TUBES FOR FLUID TRANSPORTING PIPES AND PRESSURE VESSELS
NF A49-401-88	STEEL TUBES LONGITUDINALLY FUSION WELDED NON ALLOY AND MICRO ALLOY STEEL TUBES FOR FLUID TRANSPORTING PIPES AND PRESSURE VESSELS

1.3 Offshore Pipeline System

API 5L PSL 2 Line Pipe BMS,X42MS,X46MS,X52MS,X60MS,X65MS,X70MS,X80MS

DNV OS-F101 Submarine Pipeline Systems-SAWL 245,SAWL290,SAWL 320,SAWL 360,SAWL 415,SAWL 450,SAWL 485,SAWL 555

1.4 Application

LINE PIPE AND PROCESS PIPES

Line pipe and process pipes range covers transmission lines, flow lines, jetty lines, steam lines, slug catchers, compressor stations and pump columns.

OFFSHORE PIPES

Offshore pipes include rolled and welded tubulars, cans, legs, piles, bracings, conductors, risers and tethers.

CONSTRUCTION PIPES

Construction pipes cover a range of applications including bridges, stadiums and high-rise buildings.

STEEL STRUCTURES UNDER WATER

Pipes for steel structures under water are for piles, dolphins and anchor piles.

MECHANICAL PIPES

Mechanical pipes include felt rolls, wire rolls, press rolls, dryers, reel spools, winder drums, hydraulic cylinders, cable drums, yarn rollers, rolls for weaving machinery, cardan shafts, dryer rolls.

2. Coating Specifications

2.1 External Coating

2.1.1 External Epoxy Coating

CAN/CSA-Z245.20 Standard for External Fusion Bond Epoxy Coating for Steel Pipe

AS3862 Standard Specification for External Fusion-Bonded Epoxy Coating for Steel Pipes

AWWA C210 Standard for Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines

AWWA C213 Standard for Fusion Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines.

BP GIS 06-402 Guidance on Industry Standard for Fusion Bonded Epoxy Powder External Pipeline Coatings

DEP 31.40.30.32-Gen Technical Specification for External Fusion-Bonded Epoxy Powder coating for Line Pipe

EN 10289-2007 STEEL TUBES AND FITTINGS FOR ONSHORE AND OFFSHORE PIPELINES - EXTERNAL LIQUID APPLIED EPOXY AND EPOXY-MODIFIED COATINGS

NFA 49-709 Standard for External Fusion Bond Epoxy Coating for Steel Pipe

ISO 21809-2:2007 Petroleum and natural gas industries-External coatings for buried or submerged pipelines used in pipeline transportation systems-Part 2: Fusion-bonded epoxy coatings

NACE RP 0394 National Association of Corrosion Engineers Standard Recommended Practice, Application, Performance, and Quality Control of Plant Applied, Fusion Bonded Epoxy External Pipe Coating.

NACPA 12-78 National Association of Pipe Coating Applicators External Application Procedure for Plant Applied fusion Bonded Epoxy (FBE) to Steel Pipe.

SAES-H-002	Internal and External Coatings for Steel Pipelines and Piping
09-SAMSS-089	Shop-Applied External FBE Coating
09-SAMSS-091	Shop-Applied Internal FBE Coatings

2.1.2 Polyethylene Coating

CSA Z245.21	External Polyethylene Coating for Pipe
DIN 30670	Polyethylene Sheathing of Steel Tubes and of Steel Shaped Fittings
NFA 49-710	External Three-Layer Polyethylene Based Coating, Application by Extrusion
DNV-RP-F106	Factory Applied External Pipeline Coatings For Corrosion Control
ISO 21809-1	Petroleum and natural gas industries -- External coatings for buried or submerged pipelines used in pipeline transportation systems - Part 1: Polyolefin coatings (3- layer PE and 3- layer PP)
ISO 21809-4	Petroleum and natural gas industries -External coatings for buried or submerged pipelines used in pipeline transportation systems-Part 4: Polyethylene Coatings (2-layer PE)
AS/NZS 1518	External Extruded High-Density Polyethylene Coating System for Pipes
AS4321	Fusion Bonded Medium-Density Polyethylene coating and lining for pipes and fittings
EN10288	Steel tubes and fittings for on and offshore pipelines - External two layer extruded polyethylene based coatings
DEP 31.40.30.31-Gen.	Technical Specification for External Polyethylene and Polypropylene Coating for Line Pipe
IPS-G-TP-335	Material and Construction Standard for Three Layer Polyethylene Coating System
BP GIS 06-403	Guidance on Industry Standard for the Application of Three-Layer Fusion Bonded Epoxy-Polyethylene Coating and Three-Layer Polypropylene Coating System for Line Pipe
PETROBRAS ET-200.03	Engineering Specification ("Piping Materials for Production and Process Facilities") for using low density linear polyethylene in carbon steel piping, as to appendix 13 of such specification.
09-SAMSS-113	External Renovation Coating for Buried Pipelines and Piping (APCS-113)
TS 5139	External Three-Layer Polyethylene Based Coating, Application by Extrusion
UNI 9099	Polyethylene Coating Applied by Extrusion

2.1.3 Polypropylene Coating

DIN30678 Polypropylene Sheathing of Steel Tubes and of Steel Shaped Fittings
EN 10286 Steel tubes and fittings for onshore and offshore pipelines –External three layer extruded polypropylene based coatings.
ISO 21809-1 Petroleum and natural gas industries -- External coatings for buried or submerged pipelines used in pipeline transportation systems - Part 1: Polyolefin coatings (3- layer PE and 3- layer PP)
NFA 49-711 External Three-Layer Polypropylene Based Coating, Application by Extrusion
BP GIS 06-403 Guidance on Industry Standard for the Application of Three-Layer Fusion Bonded Epoxy-Polyethylene Coating and Three-Layer Polypropylene Coating System for Line Pipe
09-SAMSS-114 Shop-Applied Extruded, Three-Layer Polypropylene External Coatings for Line Pipe

2.1.4 Polyurethane Coating

AWWA C222-99: Polyurethane Coatings for the Interior and Exterior of Steel Water Pipe and Fittings
BS 5493 Polyurethane Coating
DIN 30677.2 polyurethane Insulation of the fittings
EN 10290 External Liquid Applied Polyurethane Coatings

2.1.5 Polyolefin Coating

AWWA C225-03 Fused Polyolefin Coating Systems for the Exterior of Steel Water Pipelines
AWWA C215-99 Extruded Polyolefin Coatings for the Exterior of Steel Water Pipelines
AWWA C216-00 Standard for Heat-Shrinkable Cross-Linked Polyolefin Coatings for the Exterior of Special Sections, Connections, and Fitting for the Steel Water Pipelines
AWWA C224-01 Two-layer Nylon-11 Based Polyamide Coating System for Interior and Exterior of Steel Water Pipe and Fittings
AWWA C225-03 Fused Polyolefin Coating Systems for the Exterior of Steel Water Pipelines

2.1.6 Tape Coating

ISO 21809-3:2008 Petroleum and natural gas industries-External coatings for buried or submerged pipelines used in pipeline transportation systems-Part 3: Field joint coatings
AWWA C209-00 Standard for Cold-Applied Tape Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines
AWWA C214-00 Standard for Tape Coating Systems for the Exterior of the Steel Water Pipelines

AWWA C217-99 Standard for Cold-Applied Petrolatum Tape and Petroleum Wax Tape Coatings for the Exterior for Special Sections, Connections, and Fittings for Buried/Submerged Steel Water Pipelines

AWWA C218-02 Standard for Coating the Exterior of Aboveground Steel Water Pipelines and Fittings

AWWA C224-01 Two-layer Nylon-11 Based Polyamide Coating System for Interior and Exterior of Steel Water Pipe and Fittings

EN 12068/DIN30672 STANDARD-POLYETHYLENE SELF ADHESIVE TAPES

2.1.7 Bitumen Coating

DIN 30673 Bitumen coatings and linings for steel pipes, fittings and vessels.

2.1.8 Concrete Weighted Coating

ISO 21809-5:2009, Petroleum and natural gas industries -External coatings for buried or submerged pipelines used in pipeline transportation systems - Part 5:External concrete coating.

DNV-OS-F101 Submarine Pipeline System

ASTM C171 Specification for Sheet Material for Coating Concrete

BS EN 12620 Aggregates for Concrete

ASTM C42 Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

ASTM C642 Standard Test Method for Specific Gravity, Absorption and Voids in Hardened Concrete

ASTM C87 Standard Test Method for Effect of Impurities in Fine Aggregate on Strength of Mortar BS 1881 Methods of Testing Concrete

BS 3148 Methods of Test for Water for Making Concrete

BS 4482 Hard Drawn Mild Steel Wire for the Reinforcement of Concrete BS

4483 Specification for Steel Fabric for the Reinforcement of Concrete

BS 4449 Specification for Carbon Steel Bars for Reinforcement of Concrete

ISO 4012 Determination of Compressive Strength of Test Specimen

2.1.9 Marine Coating

EN ISO 12944:1998 Paints & Varnishes – Corrosion Protection of Steel Structures by protective paint system (parts 1 – 8)

ISO 20340:2009 Paints and varnishes – Performance requirements for protective paint systems for offshore and related structures

ISO 15741 Paints and varnishes-Friction-reduction coatings for the interior of on- and offshore pipelines for non-corrosive gases

2.2. Lining

2.2.1 Epoxy Lining

- API RP 5L2 Recommended Practice for Internal Coating of Line Pipe for Non-Corrosive Gas Transmission Service.
- API RP 5L7 (R2010) Recommended Practice for Unprimed Internal Fusion Bonded Epoxy Coating of Line Pipe
- AWWA C210 Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines
- NFA 49-709 Internal can be epoxy 80 microns

2.2.2 Bitumen Lining

- DIN 30673 Bitumen coatings and linings for steel pipes, fittings and vessels
- UNI-ISO5256/87 STANDARD-BITUMEN COATING

2.1.3 Coal-Tar Enamel Coating

- AWWA C-203 Coal-Tar Protective Coatings and Linings for Steel Water Pipelines-Enamel and Tape-Hot-Applied
- NFA 49-708 Recommended Practice for Internal Coating of Line Pipe

2.2.3 Cement Mortar Lining

- AWWA C205-00 Cement-Mortar Protective Lining and Coating for Steel Water Pipe- 4 In. (100 mm) and Larger-Shop application
- AWWA C602 Standard for Cement-Mortar Lining of Water Pipelines - 4 inch (100 mm) and Larger - In Place
- AS 1281-2001 Cement mortar lining of steel pipes and fittings
- AS/NZS 1516 Cement Mortar Lining of Pipelines In Situ
- EN 10298 Steel tubes and fittings for onshore and offshore pipelines - Internal lining with cement mortar

2.2.5 Plastic Lined

- ASTM D4894 PTFE (Polytetrafluorethylene)

ASTM D3222	PVDF(Polyvinylidene fluoride)
ASTM D4101	PP(Polypropylene)
BS 6374-2	Lining of equipment with polymeric materials for the process industries - Part 2: Specification for lining with non-sheet applied thermoplastics
BS 6374-3	Lining of equipment with polymeric materials for the process industries - Part 3: Specification for lining with stoved thermosetting resins
BS 6374-5	Lining of equipment with polymeric materials for the process industries - Part 5: Specification for lining with rubbers

Brand and Material Applied:

3M: SK 134, SK6233, SK6352 Toughkote, SK 314, SK 323, SK 206N, SK 226N, SK 6251 DualKote SK-6171, SK 206P, SK226P,

3M Internal Coatings: Coupon EP2306HP

DuPont: 7-2500, 7-2501, 7-2502, 7-2508, 7-2514, 7-2803, 7-2504 Nap Gard Gold 7-2504, Nap Rock: 7-2610, 7-2617 FBE Powders

DuPont: Repair Kits; 7-1631, 7-1677, 7-1862, 7-1851

DuPont Internal Coatings: 7-0008, 7-0010, 7-0014, 7-0009SGR, 7-0009LGR, 7-2530, 7-2534, 7-2509

Akzo Nobel: FBE - Fusion Bond Epoxy

Internline 876 Seal Coat

Hempel: 85448,97840

Interzone 276,954

Denso: 7200, 7900 High Service Temperature Coatings

Internal Liquid Epoxy: Powercrete Superflow