Index

1. Company Profile
2. Corporate Member
3. LSAW Pipe & Pile
4. HSAW Pipe & Pile
5. Roll Bending Pipe
6. Corrosion Protection
7. Inspection & Testing
8. Specifications Applied

Company Profile

Metals International Limited offers a comprehensive portfolio of Longitudinal Submerged Arc Welded (LSAW) Pipe,Spiral Welded (HSAW) Pipe,3-Roller Bending SAW Pipe/Joint to customers on international basis. The steel pipes are widely used in crude oil pipelines, natural gas pipelines, water supply lines, distribution pipelines, foundation piles, offshore platforms,pipe pilings, steel structures for construction and other general purposes by means of their wide size range. Whether our customers are active in such fields,industries or projects, we endeavor to deliver the highest quality products and value-added services that improve our customers' business efficiency.

The pipes are manufactured by latest techniques with machines and equipments which fitted highest technology, in order to provide the manufacturing of products in full conformity with international standards with high quality materials in production in line with its carefully set policies for sustainable quality as possessing API-5L PSL1/PSL2, ISO 3183-1/2/3,DNV OS-F-101, API 2B, AS 1163, AS 2885, ASTM A139, ASTM A252, ASTM A500, ASTM A 671,ASTM A672,ASTM A691,EN10208,CSA Z245.1, GOST 20295 ,IPS-M-PI-190,KOC-MP-019, AWWA C200,NACE MR0175, NACE TM0177, NACE TM0284,CSA Z245.20/CSA Z245.21,DIN 30670,DIN 30678,API RP 5L2,AS 3862,AS 3750, EN 12994 and other international specifications, and inspected and released by 3rd party inspection agency such as DNV, BV,SGS, Intertek Moody, TUV, ABS, LR, GL,PED,RINA,KR, NKK, AIB-VINEOTTE, CEIL, VELOSI, CCSI, etc.

We are the approved Corporate Member of The Australian Pipeline Industry Association Ltd (APIA) , Deep Foundation Institute(DFI), and Pile Driving Contractors Association(PDCA), as well as the qualified vendor of SNC-Lavalin,KBR, Fluor, WorleyParsons, AEE, PetroSA,Petrojet,Petronas,Sonatrach etc.

We have successfully completed the following projects:
1. Ambatovy Slurry Pipeline Project, Madagascar:
(1) 20,000 metric tons of 1016/1219.2x22mm/762x9.53mm API 5L X52 & ASTM A672 Class 70 3LPE coated UOE LSAW line pipe(TPI: SGS);
(2) 305MT of 24" API 5L X70 PSL 2 Dual Fusion Bonded Epoxy Coated Induction Bends (TPI:SGS) ;

2. New Skikda LNG Piling Project, Algeria: 105,000 metric tons of 508x12.7mm/609.6x12.7mm API 5L B PSL1/ASTM A252-II ERW/Spiral Welded Pipe Piling as one of the biggest line pipe order ex-China (TPI: Moody International);

3.PNG Moresby LNG Piling Project: 1580.838 Metric Tons of 609.6x15.9mm & 229.514 Metric Tons of 406.4x9.5mm API 5L X52 PSL2 DSAW Pipe.

4. Water Pipeline Project, Egypt: 784.521 metric tons of 457.2-1016x12.7mm API 5L B/ASTM A53 B Spiral Welded Pipe.

5. QCLNG Pipeline Project
(1) 207,000 metric tons of 42" API 5L X70 PSL 2/AS 2885-1+AS3862 UOE DSAW DFBE coated line pipe for QGC LNG Project in Australia as the first line pipe produced in line with Australian Standard AS2885-1 (TPI:ITI);
(2) 755MT of 1067mm API 5L X70 PSL 2 Induction Bends(TPI: TGRC);

6. Highland Valley Copper Mill Optimization Project: 4400 meters of 42"x0.375" API 5L B+CSA Z245.21-10 2LPE coatedLSAW Line Pipe to Canada(TPI: BV).

7.Yallourn Project,Australia: 519.2 meters of 609.6x8mm & 762.0x8mm API 5L Gr. B+AS 3862 406 micron external FBE+AWWA C210 400 micron internal Liquid Epoxy coated Spiral Welded Steel Pipe(TPI: Intertek Moody)

8. PNG Moresby Piling Project:1227 meters of O.D.813mm/1200mmxW.T.25mmxL.32000~36000mm & O.D.1000mmxW.T.20mmxL.28000~39000mm AS 1163 C350+AS 3750/EN 12994 Interzone 964 coated Pipe Piles

The mission of Metals International Limited is to provide an environment that encourages an entrepreneurial spirit among its employees that leads to the best relationships with mills and customers. We strive to be the Company that others want to do business with – on win-win basis transaction. Our extensive knowledge in metal has allowed us to save our customers time and reduce their costs.

Corporate Member

This is to certify that

Angbai Trading A Subsidiary of Metals International Limited
is a Corporate Member of the

Australian Pipeline Industry Association Ltd.

and is entitled to the rights and privileges of membership
subject to the Constitution of the Association

PRESIDENT

SECRETARY

Certificate Number 2143
Date of Admission 14 October 2012

DEEP FOUNDATIONS INSTITUTE
DFI
Deep Foundations Institute
Corporate Member:
METALS INTERNATIONAL LIMITED
Member Since 2012
Dedicated to Quality and Economy in the Design and
Construction of Deep Foundations and Excavations

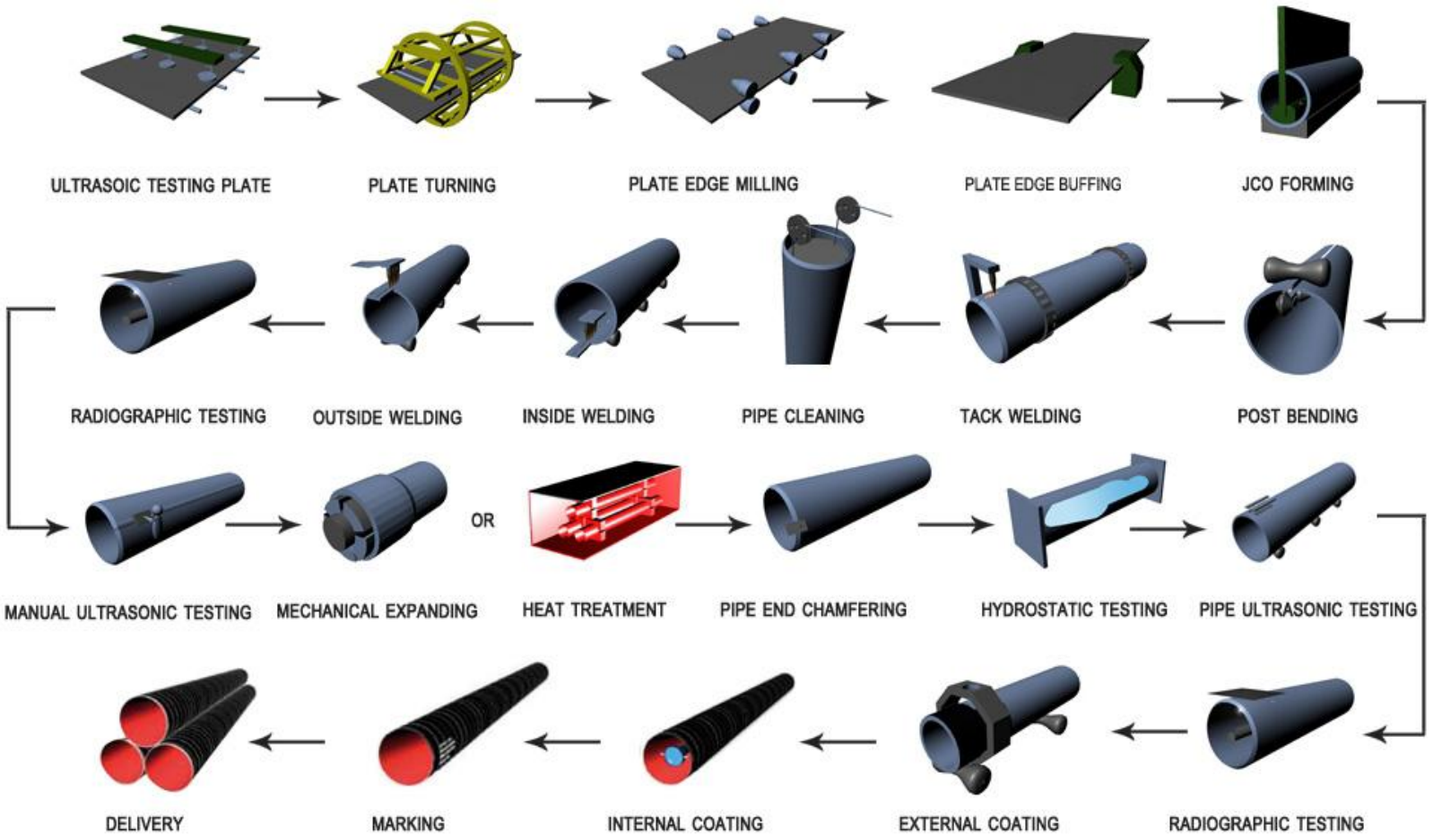
Longitudinal DSAW Pipe

OD		THICKNESS（mm）																								
In	mm	8.0	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	28.6	30.2	31.8	33.3	34.9	36.5	38.1	39.7	44.5	50.8	60
18	457.2																										
19	482.6																										
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																										

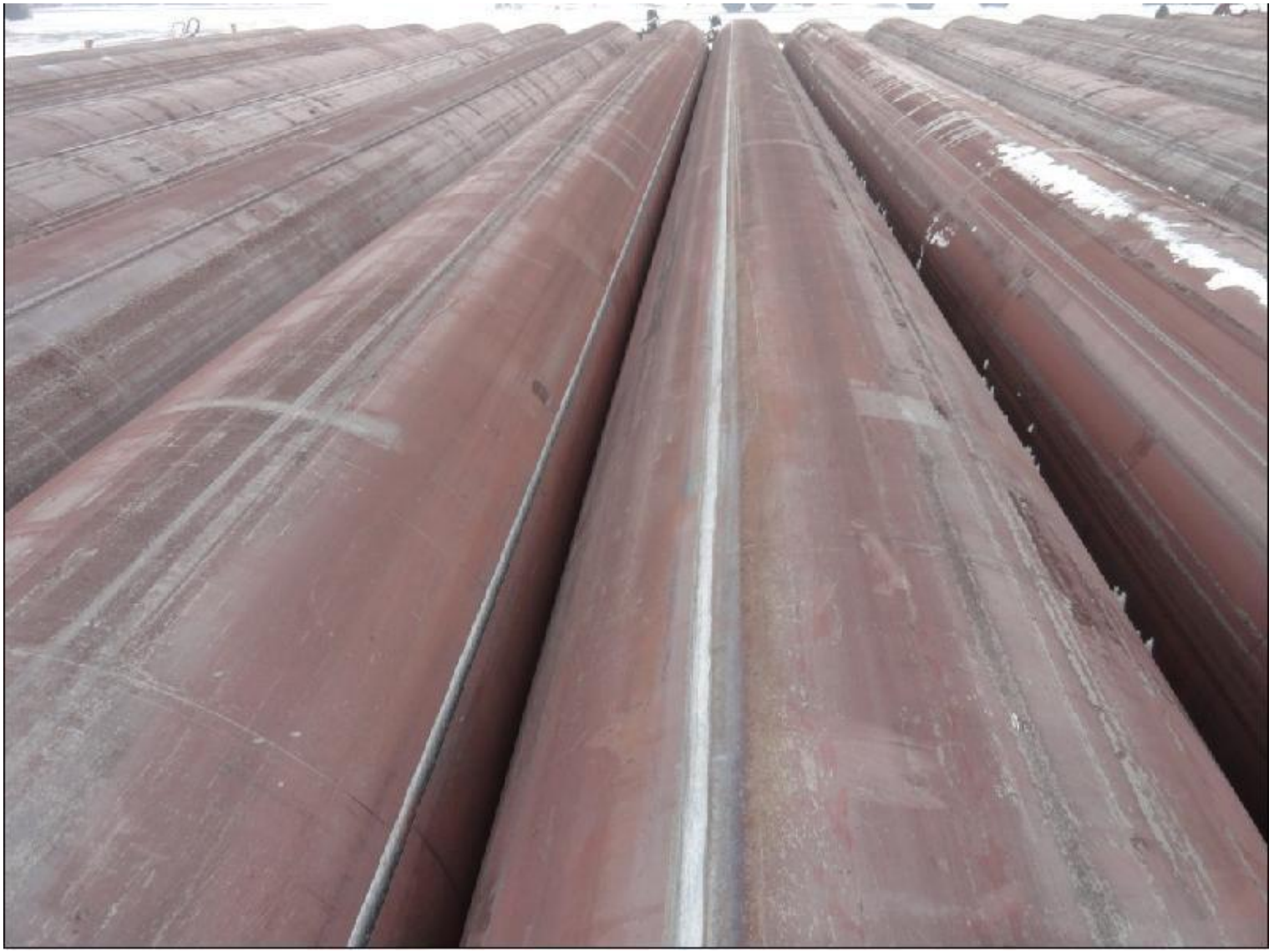
Specification: API 5L PSL 1/PSL 2/PSL 3, ISO3183-1/2/3, DNF OS-F101,AS 2885-1

Pipe Length: 6-18m (20'-60')

Longitudinal DSAW Process Flowchart



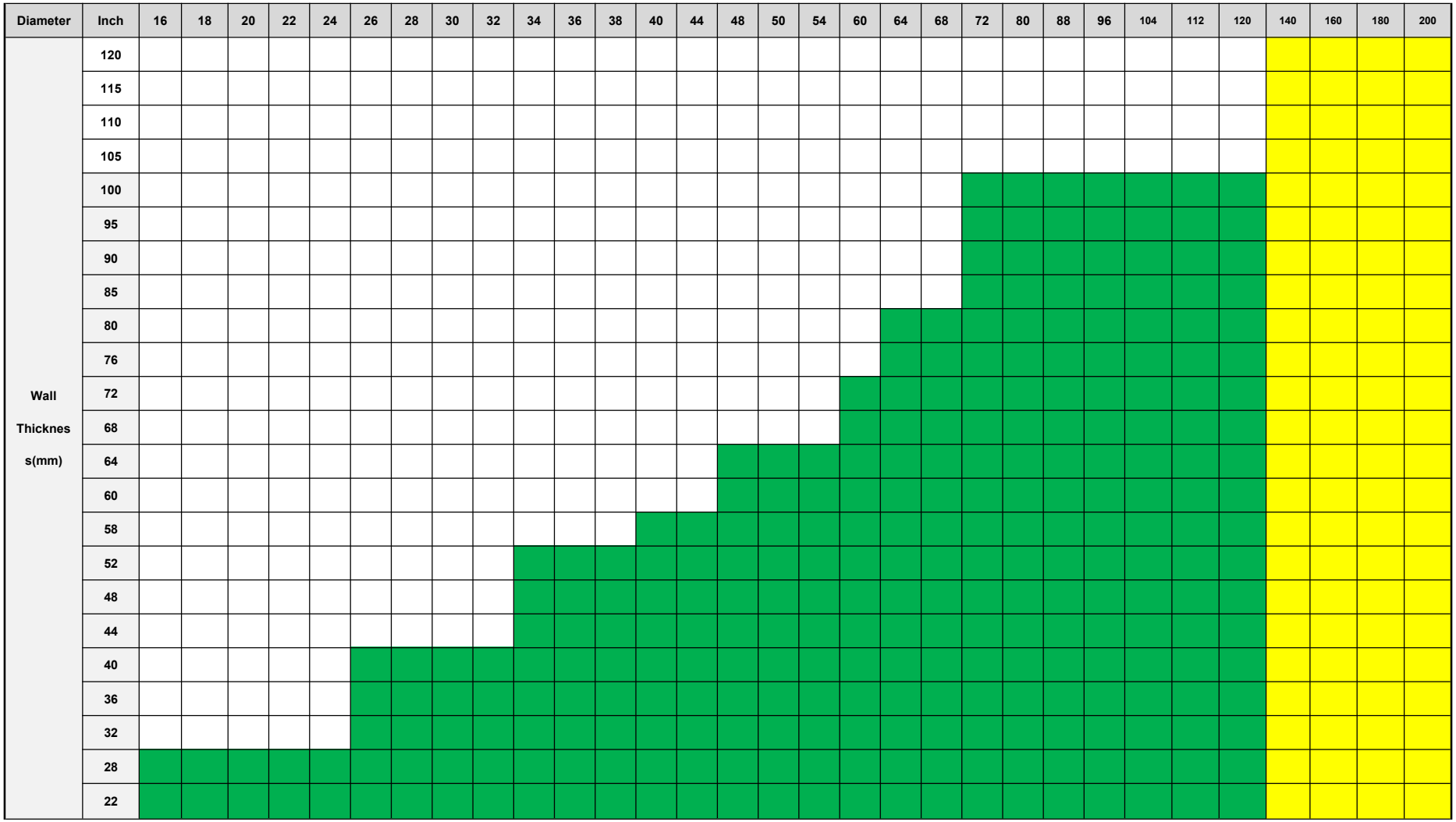
LSAW Mill Line



ROLL BENDING 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.

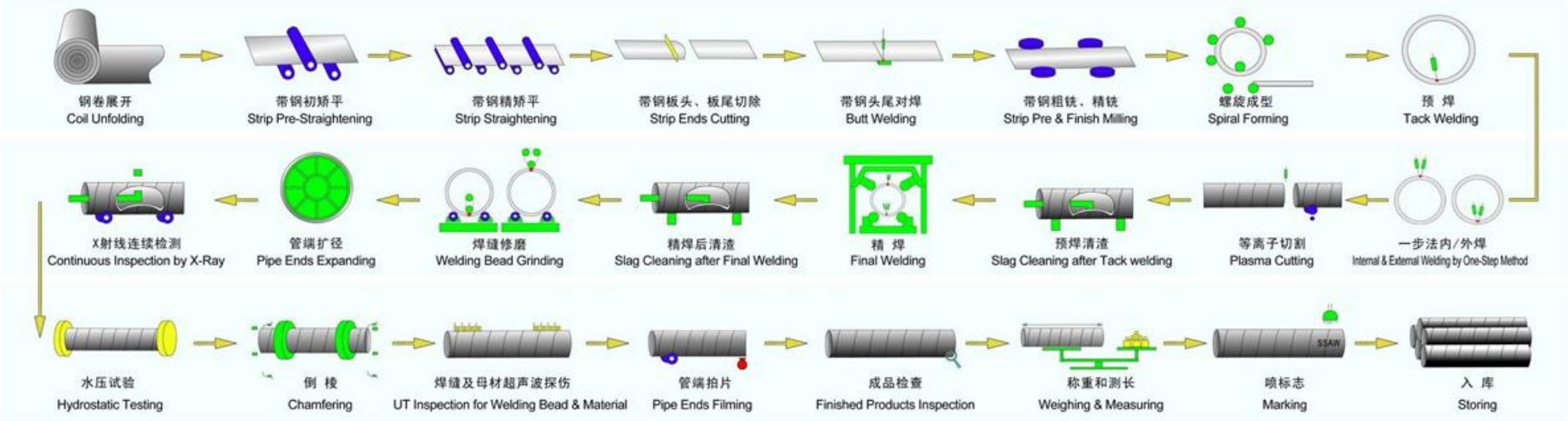
Scope of Supply



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

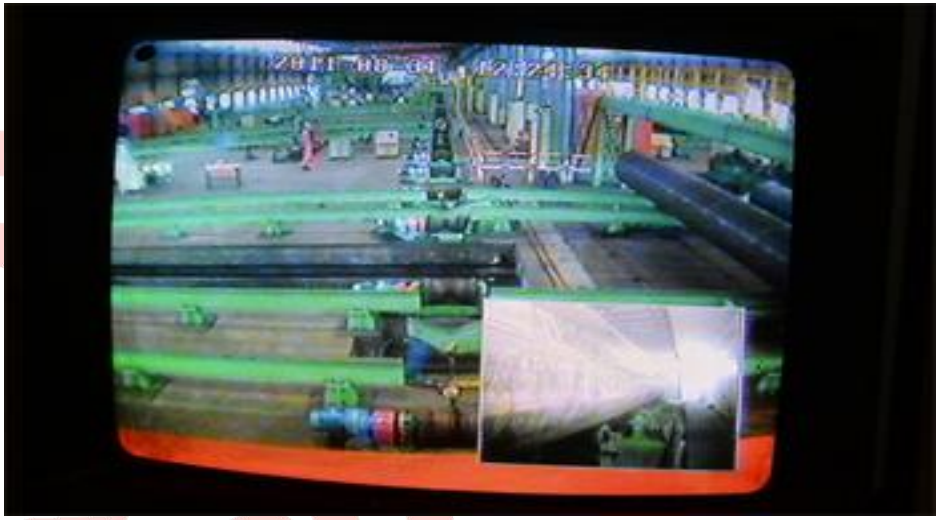
Unfolding

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

Scope of Supply

O.D.		Wall Thickness (mm)																	
(Inch)	(mm)	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	22	23.5	25
8"	219.1																		
10'	273.1										Pipe size for grade up to X70								
12"	323.9										Pipe size for grade up to X80								
14"	355.6										Pipe Size for Water & Piling								
16'	406.4																		
18"	457.2																		
20"	508																		
22'	558.9																		
24"	610																		
26"	660.4																		
28"	711.2																		
30"	762																		
32"	812.8																		
34"	864																		
36"	914.4																		
40"	1,016																		
42"	1,067																		
48"	1,220																		
52"	1,320																		
56"	1,420																		
60"	1,520																		
64"	1,620																		
68"	1,720																		

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																		

Length: 6~100M

ASTM A252 GR. 3 FLANGED SPIRAL WELDED PIPE

API 5L X65 LSAW STEEL PIPE PILES

EN 10219 J355HO PIPE PILES WITH CONICAL POINTS

EN 10219 L450 +INTERZONE 954 SPIRAL WELDED STEEL PIPE PILES WITH L-T TYPE CLUTCHES

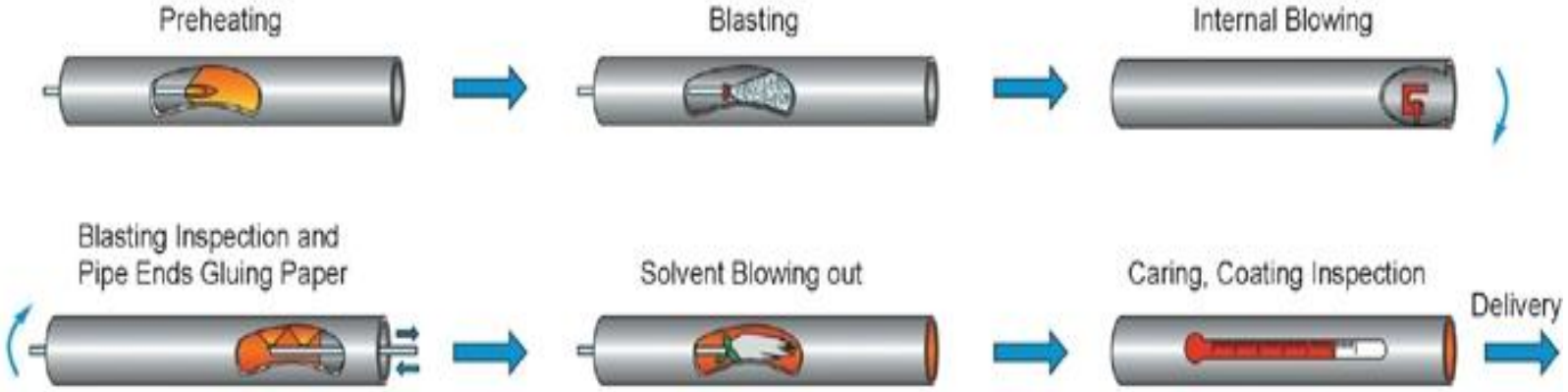
DIN 30670 3LPE COATED PIPE PILING

EN 10255 L450 MARINE PILES

Corrosion Protection

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.



F

API RP 5L2 LIQUID EPOXY LINING+ AS 3682 DFBE COATING

FBE/2FBE External/3PE/3PP 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.

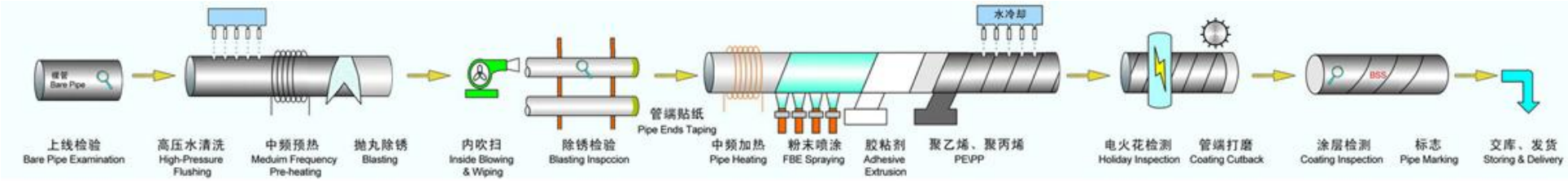
Fusion Bonded Epoxy with High Temperature Resistant Overcoating – Utilizing two completely separate powder systems, the facility can produce FBE with a high operating temperature resistant overcoating such as DuPont's Nap-Gard Gold and 3M's 6258.

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.

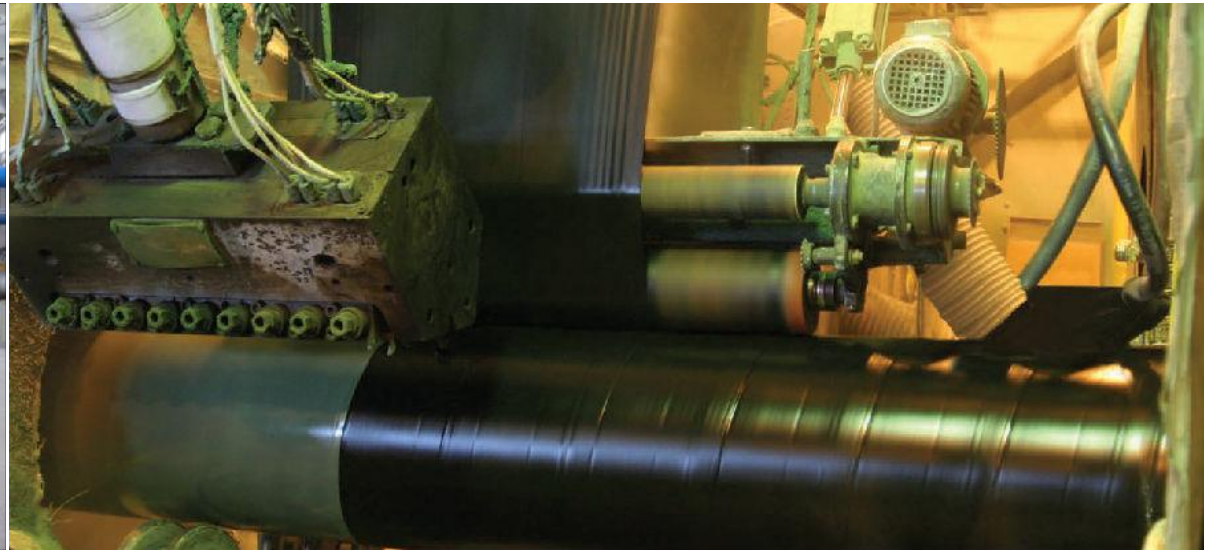
To improve anticorrosion performance and adhesion, an additional layer of epoxy primer is sprayed onto pipe surfaces prior to the adhesive layer and Polyethylene top layer application. **Three Layer Polyethylene** is suitable for service temperatures from 60°C to 80°C (85°C peaks). Typical coating thickness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

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.

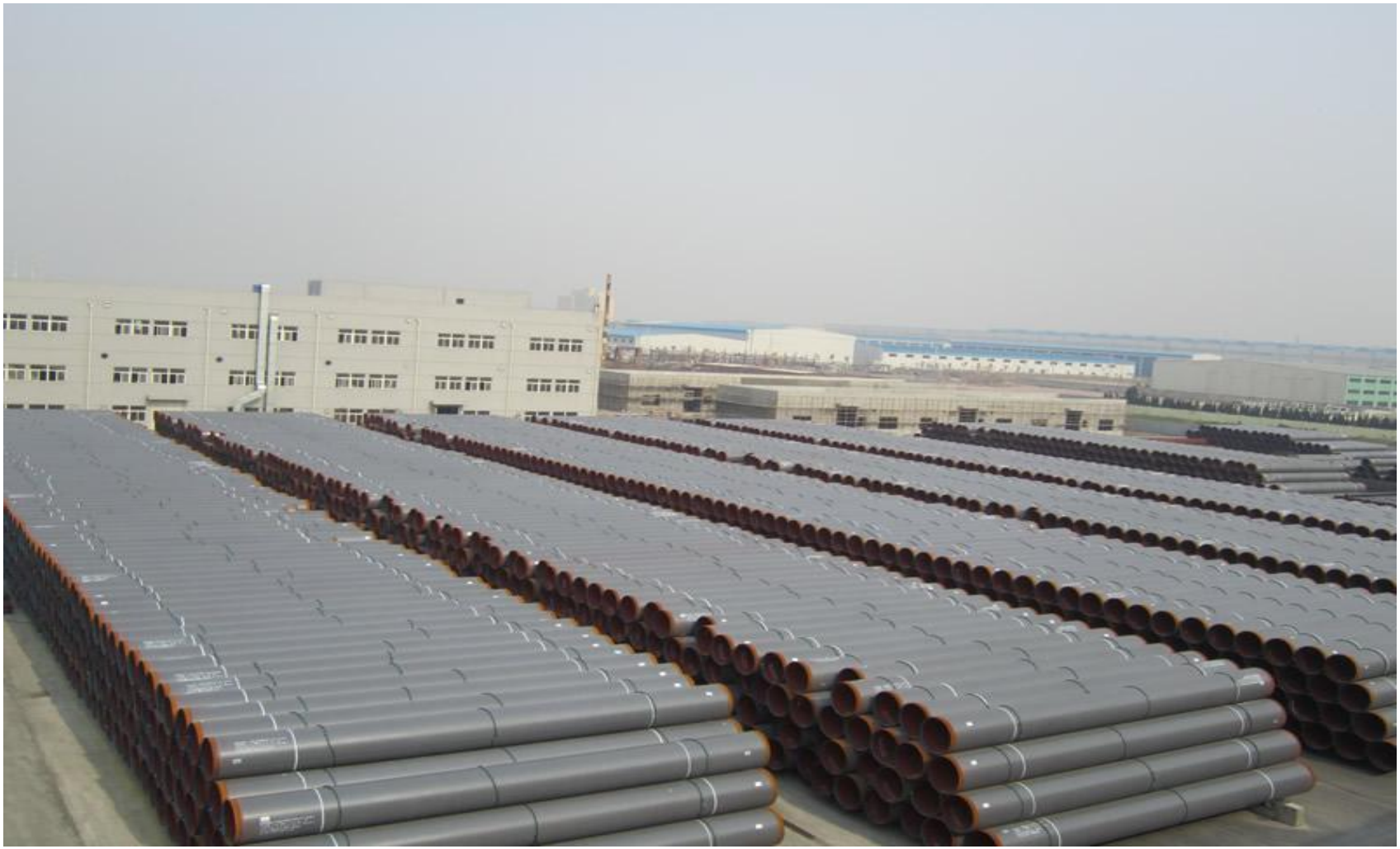
FBE/3PE/3PP Coating Process Flowchart



SHOT-BLASTING



FBE+ADHESIVE+PE COATING



AS 3862 DUAL FBE COATING

CAN/CSA Z245.20/21+AS 3862 3LPE COATING

EN 30678 3LPP COATING

Concrete Weight Coating

CONCRETE WEIGHT COATING

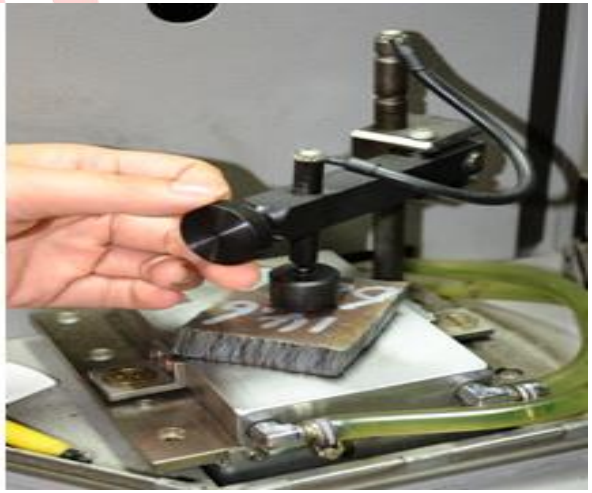
Inspection & Testing

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 Specifications

1. Steel Pipe

1.1 Line Pipe

API 5L PSL1/2 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

AS2885-1 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 Steel pipes for pipelines for combustible fluids - Technical delivery conditions - Part 1: Pipes of requirement class A-L210GA,L235GA,L245GA,L290GA, L360GA

EN10208-2 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 H2S 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 (H2S) 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 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)
AS1579 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,St44.0, 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,St44.0, 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 EVATEDTEMPERATURES
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

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
AS 3862 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 RP0394 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 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 C215 Extruded Polyolefin Coatings for the Exterior of Steel Water Pipelines
AWWA C216 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 Fused Polyolefin Coating Systems for the Exterior of Steel Water Pipelines

2.1.6 Tape Coating

ISO 21809-3 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 Coal-Tar Enamel Coating

AWWA C-203Coal-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

2.1.9 Concrete Weighted Coating

ISO 21809-5 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

2.1.10 Marine Coating

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

ISO 20340 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

2.2.2 Cement Mortar Lining

AWWA C205 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

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:Interzone 276,Interzone 485,Interzone 505,Interzone 954,Interzone
Interlining 876 Seal Coat
Hampel: 85448,97840
Denso: 7200, 7900 High Service Temperature Coatings
Internal Liquid Epoxy: Powercrete Superflow