

Projects Europe



ArcelorMittal

# Spirally welded steel pipes





# Company profile

## ArcelorMittal

ArcelorMittal is the world's number one steel company, present in more than 60 countries. It has led the consolidation of the world steel industry and today ranks as the only truly global steelmaker. ArcelorMittal is the leader in all major global markets, including automotive, construction, household appliances and packaging. The Group leads in R&D and technology, holds sizeable captive supplies of raw materials and operates extensive distribution networks.

Its industrial presence in Europe, Asia, Africa and America gives the Group exposure to all the key steel markets, from emerging to mature. ArcelorMittal will be looking to develop positions in the high-growth Chinese and Indian markets.

ArcelorMittal is listed on the stock exchanges of Paris, Amsterdam, New York, Brussels, Luxembourg and on the Spanish stock exchanges of Barcelona, Bilbao, Madrid and Valencia.

### Projects Europe

Projects Europe offers complete and customized steel solutions serving three markets:

- Foundation Solutions
- Projects Oil & Gas
- Solar Projects

Projects Europe can be involved from the early stage with an advising role towards the investor; ensuring the best and most efficient steel solution. From planning till the actual construction, Projects Europe is your steel ally who goes beyond.



### Foundation Solutions

Projects Europe offers foundation solutions for the construction of quays, harbours, locks, breakwaters and to reinforce the banks of rivers or canals. Other applications involve the protection of excavations underwater or on land, and excavation works for bridge abutments, retaining walls and underground car parks.

With the possibility to make pipes up to 2850mm diameter, 65m long (without circumferential welds) and 25.4mm thick, we have a unique position in the world.

Our worldwide presence with stocks of sheet piles, H-bearing piles and pipe piles makes us the preferred partner for our customers to offer tailor-made solutions. The complete range of products goes from hot rolled sheet piles and H-profiles to cold formed sheet piles and foundation pipes.

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# Production range

## Spiral Mill

Projects Europe's spiral mill is located on its site in Dintelmond (The Netherlands). This mill is especially designed for the production of spirally welded pipes for foundation purposes.

Our strong points are:

- Production is 100% controlled and certified with delivery of 2.2, 3.1 or 3.2 certificates according EN 10204.
- Pipes can be produced with diameters up to 2850mm and wall thicknesses up to 25.4mm (30.0mm for steel grades up to S355).
- We can provide pipes in all requested steel grades due to our worldwide network of coil producers.
- Pipes can be produced with lengths up to 65m without circumferential weld. Longer tubes can be achieved by welding.
- There is a coating facility present on our production site.
- Several specialized welding facilities are placed in line with the spiral mill for executing specific works like welding clutches or other steel parts and making butt welds.

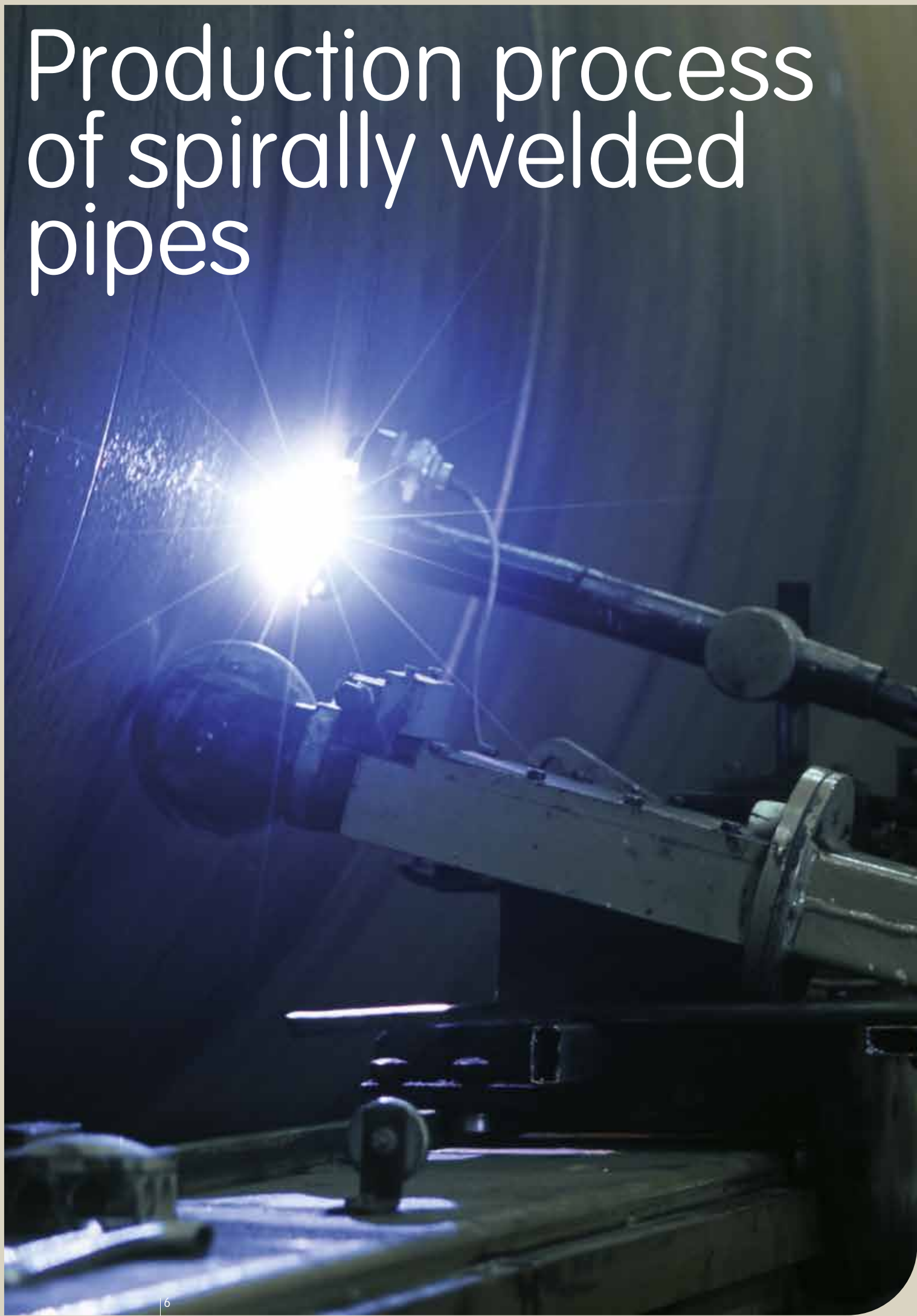
Outside diameter (mm & inch)	Weight (kg/m pipe)		Wall thickness (mm & inch)														
	mm	inch	12	13	14	15	16	17	18	19	20	21	22	23	24	25	25.4
	mm	inch	0,47	0,51	0,55	0,59	0,63	0,67	0,71	0,75	0,79	0,83	0,87	0,91	0,94	0,98	1,00
914	36	1 1/4	267	289	311	333	354	376	398	419	441	462	484	505	527	548	557
965	38	1 1/2	282	305	328	351	374	397	420	443	466	489	512	534	557	580	589
1016	40	1 5/8	297	322	346	370	395	419	443	467	491	515	539	563	587	611	621
1067	42	1 3/4	312	338	364	389	415	440	466	491	516	542	567	592	617	642	652
1118	44	1 7/8	327	354	381	408	435	462	488	515	542	568	595	621	648	674	684
1168	46	2	342	370	398	427	455	483	510	538	566	594	622	649	677	705	716
1219	48	2 1/8	357	387	416	445	475	504	533	562	591	620	649	678	707	736	748
1270	50	2 1/4	372	403	434	464	495	525	556	586	617	647	677	707	737	768	780
1321	52	2 1/2	387	419	451	483	515	547	578	610	642	673	705	736	768	799	812
1372	54	2 1/8	402	436	469	502	535	568	601	634	667	700	732	765	798	830	844
1422	56	2 3/8	417	452	486	520	555	589	623	657	692	726	760	794	827	861	875
1473	58	2 3/4	432	468	504	539	575	610	646	681	717	752	787	822	858	893	907
1524	60	2 5/8	447	484	521	558	595	632	669	705	742	778	815	851	888	924	939
1575	62	2 7/8	463	501	539	577	615	653	691	729	767	805	843	880	918	956	971
1626	64	3	478	517	557	596	635	675	714	753	792	831	870	909	948	987	1003
1676	66	3 1/8	492	533	574	614	655	696	736	776	817	857	897	938	978	1018	1034
1727	68	3 1/4	508	550	591	633	675	717	759	800	842	884	925	967	1008	1049	1066
1778	70	3 1/2	523	566	609	652	695	738	781	824	867	910	953	995	1038	1081	1098
1829	72	3 3/8	538	582	627	671	715	760	804	848	892	936	980	1024	1068	1112	1130
1880	74	3 1/2	553	599	644	690	736	781	827	872	917	963	1008	1053	1099	1144	1162
1930	76	3 1/4	568	615	662	708	755	802	849	895	942	989	1035	1082	1128	1175	1193
1981	78	3 1/8	583	631	679	727	775	823	871	919	967	1015	1063	1111	1158	1206	1225
2032	80	3 1/4	598	647	697	746	795	845	894	943	992	1041	1091	1140	1188	1237	1257
2083	82	3 3/8	613	664	714	765	816	866	917	967	1018	1068	1118	1168	1219	1269	1289
2134	84	3 1/2	628	680	732	784	836	888	939	991	1043	1094	1146	1197	1249	1300	1321
2184	86	3 5/8	643	696	749	802	855	909	962	1014	1067	1120	1173	1226	1278	1331	1352
2235	88	3 5/8	658	712	767	821	876	930	984	1038	1093	1147	1201	1255	1309	1363	1384
2286	90	3 7/8	673	729	784	840	896	951	1007	1062	1118	1173	1228	1284	1339	1394	1416
2337	92	3 7/8	688	745	802	859	916	973	1029	1086	1143	1199	1256	1313	1369	1425	1448
2388	94	4	703	761	820	878	936	994	1052	1110	1168	1226	1284	1341	1399	1457	1480
2438	96	4	718	777	837	896	956	1015	1074	1133	1193	1252	1311	1370	1429	1488	1511
2489	98	4 1/8	733	794	855	915	976	1036	1097	1157	1218	1278	1338	1399	1459	1519	1543
2540	100	4 1/4	748	810	872	934	996	1058	1120	1181	1243	1305	1366	1428	1489	1551	1575
2591	102	4 1/8	763	827	890	953	1016	1079	1142	1205	1268	1331	1394	1457	1519	1582	1607
2642	104	4 1/4	778	843	907	972	1036	1101	1165	1229	1293	1357	1421	1486	1550	1613	1639
2692	106	4 1/4	793	859	925	990	1056	1121	1187	1252	1318	1383	1449	1514	1579	1644	1670
2743	108	4 3/8	808	875	942	1009	1076	1143	1210	1276	1343	1410	1476	1543	1609	1676	1702
2794	110	4 3/8	823	892	960	1028	1096	1164	1232	1300	1368	1436	1504	1572	1639	1707	1734
2845	112	4 5/8	838	908	977	1047	1116	1186	1255	1324	1393	1463	1532	1601	1670	1739	1766

Legend:  
 X70  
 S355/X52

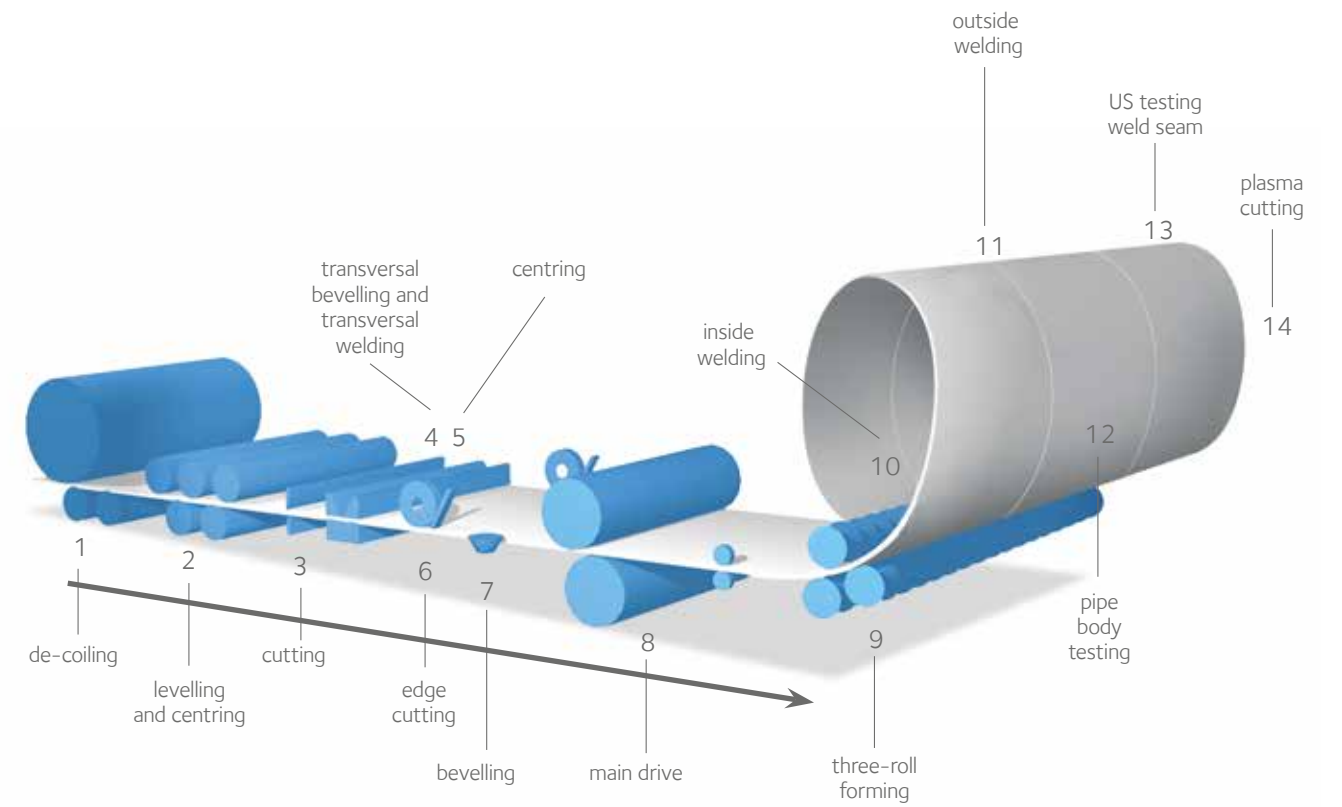
all intermediate dimensions are available on demand



# Production process of spirally welded pipes



Production Process of Spirally Welded Pipes



# The welding process



## The Welding Process

The welding of the spirally welded pipes is based on the Double-Sided Submerged Arc Welding (DSAW) process.

### The principle

Arc welding works by using electric current to produce an electric arc in a gas environment. The arc's heat brings the metal to fusion point. A key question is how to increase both the concentration and energy intensity of the arc.

DSAW's better penetration makes it possible to achieve higher weld travel speeds without impairing quality, thus improving productivity and lowering costs.

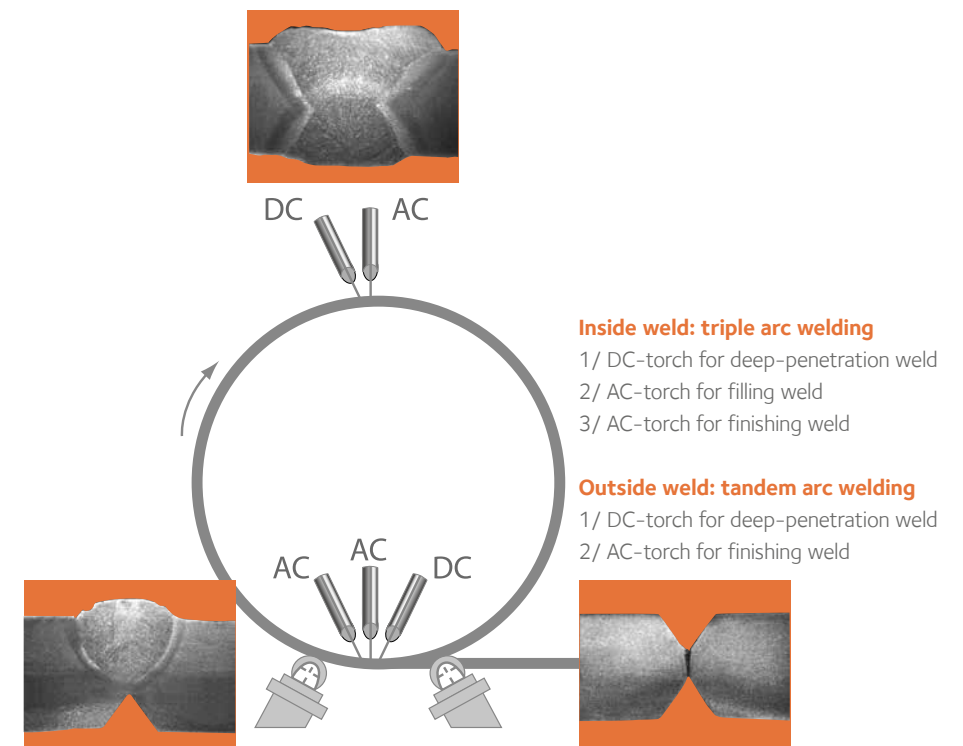
### Multi arc welding

The Spiral Mill of ArcelorMittal Projects combines the advantages of DC and AC arc combinations.

Both on the inside and the outside the multi arc principle is used. The first welding pass is done by using a DC arc. Herewith a large and concentrated penetration can be achieved. The second pass is done by using an AC arc. Herewith better deposition rates can be achieved.

The result of the multi arc welding on both sides of the coil is a full penetration weld of a very high quality produced in a cost effective way.

The flexibility of the mill is very high because of the use of this system. A large range of coil thicknesses (between 10 and 25mm) can be transformed in spirally welded pipes in an economic way by choosing the right parameters.





# Technical delivery conditions

## Technical Delivery Conditions

Pipes for construction purposes are normally produced according to EN 10219 or API 5L -PSL1. The EN 10219 is a European standard giving technical delivery conditions for cold formed, welded pipes for construction works. The API 5L is drawn by the American Petroleum Institute in order to provide standards for pipes suitable for use in conveying gas, water and oil.

### Steel grades

Steel grades are built up by symbols and numbers showing the requested properties of the steel.

- An example of a steel grade according to EN 10219: S355J0H

With: EN 10219: the European standard

S: structural steel

355: minimum yield strength [N/mm<sup>2</sup>]

J0: minimum impact energy value of 27 J at 0°C for Charpy testing, others are: JR (27 J at 20°C) and J2 (27 J at -20°C)

N or M: normalised rolling or thermomechanical rolling of the feedstock material (coils). Both are rolling processes in which the final deformation is carried out in a certain temperature range.

When a minimum impact energy value is specified at a temperature of -50°C, the letter L is added to N or M.

H: hollow sections

- An example of a steel grade according to API 5L-PSL1: X52

With: API 5L: the standard of the American Petroleum Institute

52: 52000 pounds per square inch = 359 N/mm<sup>2</sup>. This is the yield strength.

## Mechanical properties

Steel grade according to EN 10219-1	Minimum yield strength R <sub>eH</sub> (T≤16mm) <sup>2)</sup> N/mm <sup>2</sup>	Minimum yield strength R <sub>eH</sub> (16<T≤40mm) <sup>2)</sup> N/mm <sup>2</sup>	Minimum tensile strength R <sub>m</sub> (3≤T≤40mm) <sup>2)</sup> N/mm <sup>2</sup>	Minimum elongation (T≤40mm) <sup>2)</sup> %
S235JRH	235	225	340-470	24
S275J0H/J2H	275	265	410-560	20
S355J0H/J2H	355	345	490-630	20
S420MH	420	400	500-660	19
S460MH	460	440	530-720	17

Steel grade according to API 5L, PSL1 <sup>1)</sup>	Minimum yield strength R <sub>eH</sub> N/mm <sup>2</sup>	Minimum tensile strength R <sub>m</sub> N/mm <sup>2</sup>	Minimum elongation <sup>3)</sup> %
B	245	415	23
X42	290	415	23
X46	320	435	22
X52	360	460	21
X56	390	490	19
X60	415	520	18
X65	450	535	18
X70	485	570	17

<sup>1)</sup> PSL: Product specification level

<sup>2)</sup> T: Thickness

<sup>3)</sup> Depends on tensile test piece cross-sectional area

## Chemical properties

Steel grade according to EN 10219-1	Mass percentage						
	C max.	Mn max.	P max.	S max.	Si max.	N max.	CEV max. (d≤40mm)
S235JRH	0.17	1.40	0.045	0.045	-	0.009	0.35
S275J0H/J2H	0.20	1.50	0.040	0.040	-	0.009	0.40
S355J0H/J2H	0.22	1.60	0.040	0.040	0.55	0.009	0.45
S420MH	0.16	1.70	0.035	0.030	0.50	0.020	0.43
S460MH	0.16	1.70	0.035	0.030	0.60	0.025	-

Steel grade according to API 5L, PSL1	Mass percentage				
	C <sup>1)</sup> max.	Mn <sup>1)</sup> max.	P max.	S max.	Ti+V+Nb max.
B	0.26	1.20	0.030	0.030	0.15 <sup>2)</sup>
X42	0.26	1.30	0.030	0.030	0.15
X46	0.26	1.40	0.030	0.030	0.15
X52	0.26	1.40	0.030	0.030	0.15
X56	0.26	1.40	0.030	0.030	0.15
X60	0.26 <sup>3)</sup>	1.40 <sup>3)</sup>	0.030	0.030	0.15 <sup>3)</sup>
X65	0.26 <sup>3)</sup>	1.45 <sup>3)</sup>	0.030	0.030	0.15 <sup>3)</sup>
X70	0.26 <sup>3)</sup>	1.65 <sup>3)</sup>	0.030	0.030	0.15 <sup>3)</sup>

<sup>1)</sup> According to API 5L: For each reduction of 0.01% below the specified maximum carbon content, an increase of 0.05% above the specified maximum manganese content is permissible, up to a maximum of 1.50% for grade X42 to X52, 1.65% for X56 to X65 and 2.00% for X70

<sup>2)</sup> Unless otherwise agreed, the sum of the niobium and vanadium contents shall be ≤ 0.06 %.

<sup>3)</sup> Unless otherwise agreed.

## Geometric tolerances

Standard	Outside diameter D	Wall thickness T	Straightness	Out-of-roundness	Mass	maximum weld bead height <sup>1)</sup>
EN 10219-2	+/- 1% max. +/- 10.0 mm	+/- 10% max. +/- 2.0 mm	0.20% of total length	+/- 2%	+/- 6%	T ≤ 14.2 mm: 3.5 mm T > 14.2 mm: 4.8 mm

<sup>1)</sup> Tolerance on height of internal and external weld bead for submerged arc welded hollow sections.



# Combined walls

## Combined Walls

A combined wall is the retaining wall solution when a high horizontal or vertical bearing capacity is required. A combined wall combines pipes (primary elements) with intermediate sheet piles (secondary elements).

Structurally the pipes fulfil two functions:

- as retaining elements for horizontal loads from soil and water pressures
- as bearing piles for vertical loads

The intermediate sheet piles transfer horizontal loads to the pipes. Intermediate sheet piles can be shorter than the pipes. The table below gives only a part of the possibilities with combined walls. All kinds of combinations are possible, so tailor-made solutions can be delivered.



Pipe Dimensions		Intermediate Sheet Piles = double AZ18				Intermediate Sheet Piles = triple PU18			
Diameter (mm)	Thickness (mm)	M60% (kg/m <sup>2</sup> )	M100% (kg/m <sup>2</sup> )	I (cm <sup>4</sup> /m)	W (cm <sup>3</sup> /m)	M60% (kg/m <sup>2</sup> )	M100% (kg/m <sup>2</sup> )	I (cm <sup>4</sup> /m)	W (cm <sup>3</sup> /m)
914	10	140	167	149.832	3.279	131	164	128.215	2.806
	12	160	187	174.896	3.827	147	180	148.383	3.247
	14	180	207	199.625	4.368	163	196	168.280	3.682
1016	12	166	192	223.588	4.401	152	184	188.843	3.717
	14	187	213	256.351	5.046	169	201	215.433	4.241
	16	208	234	288.719	5.683	186	218	241.703	4.758
1220	14	200	223	398.241	6.529	181	211	335.084	5.493
	16	223	247	450.554	7.386	200	230	378.196	6.200
	18	246	270	502.341	8.235	219	249	420.874	6.900
1420	16	236	257	652.832	9.195	212	240	551.496	7.768
	18	261	282	729.430	10.274	233	261	615.445	8.668
	20	286	307	805.367	11.343	253	282	678.842	9.561
1520	16	241	262	770.638	10.140	217	245	653.432	8.598
	18	267	288	861.705	11.338	239	266	729.907	9.604
	20	293	314	952.039	12.527	261	288	805.766	10.602
1620	18	273	293	1.006.693	12.428	245	271	856.130	10.570
	20	300	320	1.112.824	13.739	267	294	945.745	11.676
	22	326	347	1.218.152	15.039	290	316	1.034.681	12.774
1820	18	284	303	1.335.351	14.674	256	281	1.144.634	12.578
	20	312	331	1.477.344	16.235	280	305	1.265.735	13.909
	22	340	359	1.618.384	17.784	304	329	1.386.022	15.231
2020	20	323	341	1.899.968	18.812	291	315	1.640.324	16.241
	22	352	370	2.082.494	20.619	316	340	1.797.381	17.796
	24	382	399	2.263.915	22.415	341	365	1.953.488	19.341
2500	21	360	376	3.309.036	26.472	327	348	2.903.123	23.225
	23	392	408	3.614.423	28.915	355	376	3.170.600	25.365
	25	424	440	3.918.320	31.347	383	404	3.436.772	27.494
2850	21	374	388	4.498.932	31.571	341	361	3.986.536	27.976
	23	407	421	4.916.051	34.499	371	390	4.355.730	30.567
	25	440	454	5.331.389	37.413	400	420	4.723.348	33.146

With:

- Diameter: Outside diameter of pipe [mm]
- Thickness: Wall thickness of pipe [mm]
- M60%: Mass of combined wall with a length of the intermediate sheet piles equal to 60% of the length of the pipes [kg/m<sup>2</sup>]
- M100%: Mass of combined wall with a length of the intermediate sheet piles equal to the length of the pipes [kg/m<sup>2</sup>]
- I: Moment of inertia of combined wall [cm<sup>4</sup>/m]
- W: Section modulus of combined wall [cm<sup>3</sup>/m]

The weight of the interlocks welded on the pipes is neglected.

The following formulas can be helpful for the design of combined walls:

$$I_{prim} = \frac{\pi \cdot (D^4 - (D-2 \cdot t)^4)}{64} \quad W_{prim} = \frac{I_{prim}}{0,5 \cdot D}$$

$$I = \frac{I_{prim} + I_{sec}}{b} \quad W = \frac{I}{0,5 \cdot D} \quad \sigma = \frac{M}{W}$$

With:

- t: Wall thickness [cm]
- W<sub>prim</sub>: Section modulus of the pipe [cm<sup>3</sup>]
- I<sub>prim</sub>: Moment of inertia of the pipe [cm<sup>4</sup>]
- I<sub>sec</sub>: Moment of inertia of sheet piles [cm<sup>4</sup>]
- b: System width [m]: pipe diameter [m] + width of sheet piles [m] + 0,05m (interlocks)
- D: Outside pipe diameter [cm]
- σ: Maximum steel stress due to bending moment [N/mm<sup>2</sup>]
- M: Bending moment [Nm]

Calculation sheets can be found on our website ([www.arcelorprojects.nl](http://www.arcelorprojects.nl)).

The diameter and thickness of the pipes, the intermediate sheet piles and the steel grade determine the strength of a combined wall. Varying these parameters leads to an optimized solution.

Soil conditions, installation lengths and durability demands may lead to design restrictions for pipe dimensions and intermediate sheet piles.

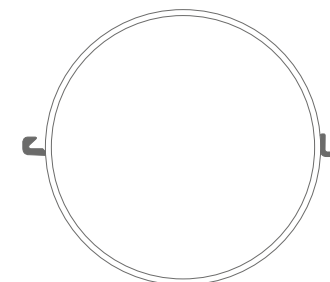
The advantages of AZ sheet piles in combined walls are:

- Load-displacement behaviour is far better than that of double and triple U-piles, so settlements are less.
- High soil and water pressures are increasingly transferred to the pipe as normal tensile stresses (membrane effect).
- Because of their geometry, AZ intermediate sheet piles are coping better with driving deviations of the pipes than U-piles, because of the triple hinge system.
- Larssen-type interlocks contribute to the high performance of AZ intermediate sheet piles.
- In tests is measured that AZ intermediate sheet piles can resist very high ultimate loads, for example up to 57m hydraulic head for an AZ 18 (S 430 GP).

There are two standard solutions to connect sheet piles with pipes: with C6 interlocks or with C9 interlocks.

Advantages C6:

- Less weight than C9, therefore more economical
- Easy to weld



Advantages C9:

- Fixed interlock opening



# Coating



## Coating

The classical protection for steel tubes is surface coating.

The European standard EN ISO 12944 deals with protection by paint systems and its various parts cover all the features that are important in achieving adequate corrosion protection.

In certain situations where there is no oxygen (deep below surface level) steel tubes may not corrode. When water and oxygen are both available, corrosion takes place by an electrochemical process. Coating systems are used to protect against corrosion as well as for decoration, but before a coating system is applied it is essential that the steel surface is properly blasted.

## Surface Preparation

The most commonly used preparation grades are, according to the ISO 8501-1 standard:  
ISO Sa 2.5: very thorough blast cleaning  
ISO Sa 3: blast cleaning to visually clean steel.

## Coating Systems

In the following, some paint systems are proposed for different environments according to the classification of EN ISO 12944.

### Atmospheric exposure

Steel tubes can be partly exposed to the atmosphere, for example when used as pillars for bridges or in permanent retaining combiwalls. In such applications, polyurethane finishes provide an aesthetical and functional look. They combine gloss and color retention and are easy to apply and maintain.

#### Proposal (EN ISO 12944 - table A4, corrosivity category C4)

Zinc silicate epoxy primer (50 $\mu$ m)

Recoatable epoxy intermediate coating (140 $\mu$ m)

Aliphatic polyurethane topcoat (40 $\mu$ m)

Nominal dry film thickness of the system: 230 $\mu$ m

### Freshwater immersion

Freshwater immersion is usually less corrosive than in marine conditions, but there can be aesthetic considerations. For convenience here, a system has been chosen which is capable of performing well both above and below water.

#### Proposal (EN ISO 12944 - table A8, corrosivity category Im 1)

2 coats of polyamide cured epoxy coating (150 + 150 $\mu$ m)

Nominal dry film thickness of the system: 300 $\mu$ m

### Seawater immersion

Structures continuously or partially immersed in seawater require careful attention. For long-term performance in immersion there should be no compromise on quality. The application must be properly carried out and inspected and, of course, the coating system must be of high quality.

#### Proposal 1 (EN ISO 12944 - table A8, corrosivity category Im 2)

Polyamide cured epoxy primer (50 $\mu$ m)

2 coats of polyamide cured coaltar epoxy coating (200 + 200 $\mu$ m)

Nominal dry film thickness of the system: 450 $\mu$ m

#### Proposal 2 (EN ISO 12944 - table A8, corrosivity category Im 2)

Polyamide cured epoxy primer (50 $\mu$ m)

Glassflake reinforced polyamide cured epoxy coating (400 $\mu$ m)

Nominal dry film thickness of the system: 450 $\mu$ m

All coating systems can be provided by ArcelorMittal Projects for its entire production range.



# Logistics and services

## Logistic Process

ArcelorMittal Projects deals with the all logistics starting with the acceptance and storage of base materials until tailor-made deliveries on the job site worldwide.

An experienced team is at our clients service to arrange road, rail or water transport all over the world, all additional activities such as loading and unloading facilities, custom clearance, local taxes etc. included.

## Transport by truck

ArcelorMittal Projects has a close cooperation with specialized companies to ensure in-time deliveries with lengths up to 40m.

## Transport by rail

Delivery of lengths up to 32m can be done in most European countries.

For longer items a specific study needs to be done before executing.

## Transport over water

Both our site in Dintelmond and Moerdijk are directly connected to deep water in the port of Rotterdam area.

The loading berths are equipped with cranes with lifting capacities over 120 tons. Herewith long and heavy pipes can be transported directly after production to our clients without additional transshipments.

## Delivery Conditions

All deliveries made by ArcelorMittal Projects are in accordance with Incoterms 2010.

Below you will find some examples of these terms.

### All modes of transport

- EXW Ex Works (named place of delivery)
- FCA Free Carrier (named place of delivery)
- CPT Carriage Paid To (named place of destination)
- CIP Carriage and Insurance Paid to (named place of destination)
- DAT Delivered At Terminal (named terminal at port or place of destination)
- DAP Delivered At Place (named place of destination)
- DDP Delivered Duty Paid (named place of destination)

### Sea and inland waterway transport

- FAS Free Alongside Ship (named port of shipment)
- FOB Free On Board (named port of shipment)
- CFR Cost and Freight (named port of destination)
- CIF Cost, Insurance and Freight (named port of destination)

ArcelorMittal Projects can arrange all necessary export documents such as EX1, EUR1, certificates of origin, etc.

## Services

ArcelorMittal Projects delivers the entire range of steel foundation products to its customers, and offers a total solution to its customers in civil engineering.

In order to do so, ArcelorMittal Projects relies on 3 pillars:

### 1. Extensive product range:

- Spirally welded pipe mill: unique state-of-the-art pipe producing mill with production specifications ranging from
  - thickness 10-25.4 mm (30.0mm for steel grades up to S355).
  - 914mm-2850mm diameter
  - Steel grades up to X80
  - Capacity to produce pipes up to 65m length without circumferential weld.
- Large stock of steel pipes:
  - Newly produced, high quality pipes from overrollings, mainly meant for gas transportation or water transmission pipelines.
  - Used pipes, formerly used as water or gas pipe lines.
- Other pipes: if the customer's requirement is beyond our production range, we will rely on our worldwide network of pipe producers, in order to find a technically and economically optimized solution for our customers.

### 2. Fabrication of end products:

Because all our fabrication halls have direct access to deep water, we are able to deliver end products up to 120 ton per piece.

Our services are:

- Construction of: piles for combiwalls (welding of clutches and welding pipes to required lengths), box piles, special sheet piles, MV piles, walings and struts for supporting sheet pile walls...
- Sealing of interlocks with: Beltan® Plus, Arcoseal™, Roxan® Plus, Akila® or by welding.
- Coating: when end products need to be treated we can provide all requirements.

### 3. Technical support

With our team of engineers we are able to find the most suitable solution for our customers projects by providing: feasibility studies, dimensioning of entire structures, elaboration of anchorage or strutting systems, calculation of vertical load-bearing capacity...

We can also provide driving plans.





# Quality control

## Quality Control

### 1. Certification

Projects Europe has been certified for many years for the production of spirally welded steel pipes. Our production facility is certified to produce spirally welded pipes according to customer requirements e.g.: EN 10219. Projects Europe has the right to issue 3.1. certificates with their products. 3.2. certificates can be issued when the production is controlled by a notified third party.

### 2. The quality process

Our quality management system is certified according to EN ISO 9001 (Lloyd's Register Quality Assurance) to ensure a completely controlled process from purchasing the coils until delivery of the final goods to our clients. Furthermore, we hold a certification to produce under the CE MARK and the German DIN 18800 -7 (Grosser Eignungs Nachweiss).

Being a certified mill for spirally welded steel pipes the following quality conditions are guaranteed:

- Internal procedures for production of spirally welded pipes, and implementation of them in the production process
- Conformity of our procedures to EN 10219
- Methodology for testing and inspection in order to deliver quality products:
  - Purchase of base material with certificates of conformity as per the clients detail
  - Welding procedures and welders qualifications
  - Control on dimensioning
  - Visual inspection
  - Non-destructive inspection: the welds are 100% US tested
- Methodology for storage of end products
- Methodology for transport



ISO 9001 : 2008



EN 10219-1:2006



EN1090-1



OHSAS



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