

Arvedi Tubi Acciaio 

Welding Relation

Arvedi



Arvedi Tubi Acciaio

Finarvedi is the holding company of the **Arvedi Group**, the core business of which is composed of steelmaking activities with annual volumes of over 4.5 million tonnes of products characterised by high quality and destined for the most demanding markets.

The **Arvedi Group** can count about 3800 employees and a consolidated turnover of about €3 billion. Six manufacturing units operating in three specific sectors make up the **Arvedi** main nucleus:

- **Acciaieria Arvedi S.p.A.** (Cremona) manufacturer and distributor of flat rolled carbon steel products;
- **Acciaieria Arvedi** (Trieste) integrated into the Cremona supply chain with the supply of pig iron and equipped with a metallurgical complex for cold rolling special steels of high added value;
- **Arvedi Tubi Acciaio S.p.A.** (Cremona) operating in the carbon steel welded and cold drawn tube sector;
- **Ilta Inox S.p.A.** (Robecco d'Oglio - CR) operating in the stainless steel welded tube sector;
- **Arinox S.p.A.** (Sestri Levante - GE) manufacturer of re-rolled stainless steel precision strip;
- **Metalfer** (Roè Volciano-BS) manufacturer of cold drawn welded carbon steel tubes.



HIGH TECHNOLOGY & EXPERIENCE

Advanced technology, experience consolidated over the years, the constant search for quality, flexibility and customer service, are the strong points of **Arvedi Tubi Acciaio S.p.A**, a leader in welded tube for special applications.

With a production capacity of over 600,000 tpy, the Cremona-based company holds a considerable share of the market in the automotive, mechanical applications, heat transfer and pressure equipment, piping, industrial and civil constructions.

Its stretch-reducing mill and HFI welding lines, fitted with the most advanced automation technology, allow customer to be offered a vast range of products that can meet the strictest requirements and standards.

ATA's production range meets the requirements of three basic areas of application, namely special, energy and civil engineering and includes round tube and pipe in diameters from 17.2 to 355.6 mm. Square hollow section from 100x100 to 300x300 mm and rectangular hollow section from 120x80 to 400x200 mm in a range of wall thicknesses from 1,2 to 16 mm.





TUBES MANUFACTURING PROGRAMME

TUBES AND PIPES TECHSHEET

	(mm)												
Ø OD	1,2	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	7,0
17,2													
19,0-20,0-21,3													
25,4													
26,4-26,9-28,0													
30,0-30,8-32,0													
33,7													
35,5													
38,0-40,0													
42,0-42,4													
44,5-45,0													
48,0-48,3													
50,0-50,8-51,0													
54,0-56,0-57,0													
60,0-60,3													
63,5-65,0													
70,0-72,0-73,0													
76,1													
80,0-82,5													
88,9-90,0													
100-101,6													
108,0													
114,3-115													
127,0													
133,0													
139,7													
152,4													
159,0													
168,3													
177,8													
193,7													
219,1													
244,0													
273,0													
323,9													
355,6													
Ø OD	1,2	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	7,0

[illegible]

Energy & Power		
standard	application	description
EN 10217-1	Pressure applications	Welded steel tubes for pressure applications at ambient temperature
EN 10217-2	Pressure applications	Welded steel tubes for pressure applications at high temperature
EN 10217-3	Pressure applications	Welded steel tubes in fine grane alloy steel for pressure applications
EN 10217-4	Pressure applications	Welded steel tubes for low temperature applications
ASTM A178	Pressure applications	Welded steel tubes for boilers and heat exchangers
ASTM A214	Pressure applications	Welded steel tubes for heat exchangers and condensers
EN 10255	Gas and water	Non-alloyed welded steel tubes suitable for welding and threading
UNI 7683	Conduit	Welded tubes cable conduits
ASTM A53	Pressure applications	Black and hot-deep galvanized welded tubes
EN ISO 3183	Line pipe	Welded steel tubes for combustible fluids line pipes
API 5L	Line pipe	Line pipe
EN 10224	Line pipe	Welded steel tubes for conveyance of liquids
EN 253	District heating	Welded tubes for district heating
ISO 11960	OCTG	Tubes for petroleum applications - casing and tubing
API 5CT	OCTG	Tubes for petroleum applications - casing and tubing

OTHER SIZE AVAILABLE ON REQUEST



THE ARVEDI HOT STRECH-REDUCED

Arvedi hot rolled tubes (Arvedi LC® and GSM®) are produced on the hot stretch-reducing mill, a unique plant that allows to obtain small and medium diameter tubes with the internal bead removed.

The plant dates back to 1973 when the stretch reducing mill (**SRM**) was installed downstream from a high frequency welding machine (**ERW**), an absolute innovation in Italy.

Starting with black and galvanised gas and water pipe production with the trademark **Arvedi LC** (hot rolled), in the course of two years it was able to propose a new product, **GSM**, heavy wall hot reduced tube for specialist applications.

The excellent degree of workability, appreciated by users of **Arvedi LC®** and **GSM®** tube, is the result of a controlled hot reduction process which, besides supplying the tube in the normalized state, guarantees complete homogeneity of the material's mechanical and physical characteristics.

The **SRM** produces the whole range of tubes in diameters from 17,2 to 88,9 mm in wall thicknesses from 1,8 to 12,5 mm.

ARVEDI LC® TUBES

Arvedi LC® is the **Arvedi** trademark that identifies the production of tubes and pipes for the plumbing and heating sector obtained with a hot rolling process.

These tubes and pipes, in compliance with standard **EN 10255**, are used for plumbing and heating equipments.

After the production process these tubes and pipes are hot-dip galvanized **EN 10240** using lead-free zinc with a high degree of purity.

Arvedi LC® tubes can be supplied with the following end finishing:

- plain, square cut or beveled,
- external taper threads (EN 10226-1) without or with socket onto one end, socket in compliance with EN 10241,
- grooved: suitable for using "Vitaubic"-type screwed couplings



ARVEDI GSM[®] TUBES

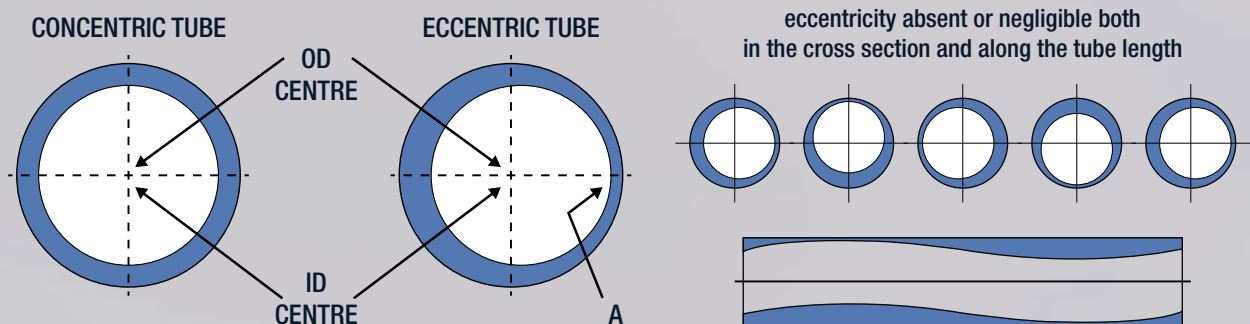
The characteristics of homogeneity and workability of **Arvedi hot stretch reduced** tubes are enhanced in the heavy wall mechanical tubes (**GSM[®]**) where the ratio between wall thickness and diameter is pushed to ratios of over 30%.

GSM tube presents a smooth internal surface without the welding bead, even for small diameter and heavy wall products, as it is rolled from a large diameter welded tube from which the bead has been removed. **GSM** is therefore suitable for cold drawing and for all mechanical processing's which require a good internal tube surface.

The peculiarity of **Arvedi** process is due to the rolling of **HFI** welded mother shell on motorized stands mill. The **Arvedi** mother shell is not obtained from billet "piercing" (as for seamless process). In addition, the **Arvedi** mother shell starts from a strip with limited thickness variations. All these peculiarities guarantee superior geometrical characteristics, negligible and limited internal polygonality of tubes produced.

Synergy with **Acciaieria Arvedi** allows it to develop new products made with special steels and aimed at specific projects. The production line from the steel to the finished and pre-processed tube responds with ideas and solutions, even personalised ones, to the most varied demands.

ARVEDI LC/GSM TUBES VS SEAMLESS



The perfection of cold formed with all the benefits of hot finished

Arvedi LEONARDO hot finished structural hollow sections are HFI welded tubes made in accordance with standard EN10210-1 / 2 as well as the special features of cold-formed welded tubes, such as:

- absence of eccentricity,
- close tolerances on wall thickness,
- precision on the corner radius,
- excellent surface finishing, both in terms of absolute roughness and surface scale (in line with the prescriptions of standard EN 10163-3 class D, subclass 3),
- customizable sizes and lengths;

Arvedi LEONARDO have all the benefits of hot finished tubes, such as:

- homogeneity of the technical characteristics: workability, weldability, ductility, plasticity and bendability,
- absence of residual stresses in the section corner areas and the tube welding area,
- suitability for weld on the corner over the whole Arvedi size range, overcoming the limits defined in Eurocode 3 (also for wall thicknesses > 12.5 mm);

Arvedi LEONARDO, thanks to the type of full body normalizing heat treatment, compared to those of some competitors:

- are optimal for use in building steel structures in seismic areas,
- thanks to the extensive plastic field they have a large capacity to absorb energy, a characteristics with makes them ideal for the constructions, structures, and machinery subject to sudden loads, repeated loads, fatigue and vibrations,
- are ideal for curving and bending and generally have a high workability;

Certified steel

For the steel grades included in the standard **EN10210 ARVEDI Leonardo Hot Finished Hollow** Sections supplies are **CE** certified and are accompanied by **EN10204** certificate and declaration of performance (in accordance with Regulation EU 305/2011).

ARVEDI Leonardo Hot Finished Hollow Sections is CE certified for construction products: **EN 10210 license no. CE 1608 CPR P063 & P157.**

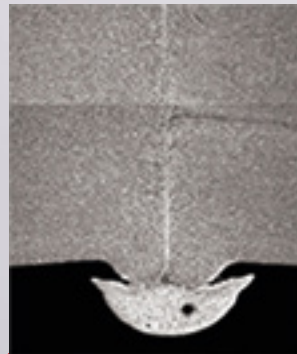


THE ARVEDI HOT FINISHED

Compared to best competitors, Arvedi LEONARDO also add:

1) WELDING ASPECT: welding and heat affected zone completely re-transformed;

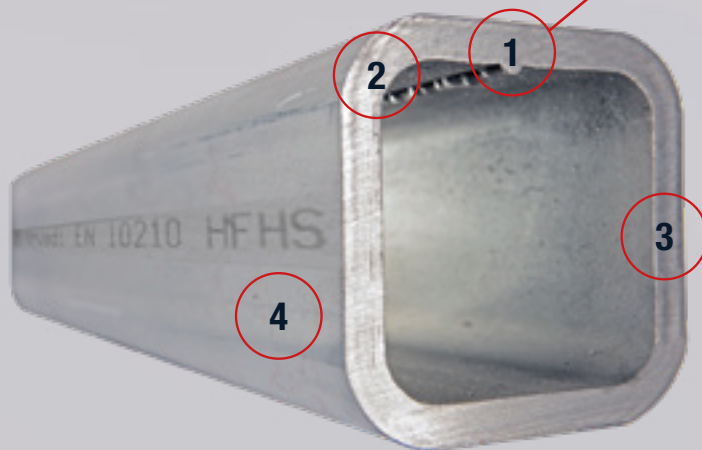
- (optionally) inner seam can be removed upon request,
- control of the position of the internal welding seam, always at the center of the larger side



ARVEDI HOT FINISHED



HOT FINISHED
OF SOME COMPETITOR



2) CORNER RADII: precise and tight corner profile,

- external radius $< 2 \times T$ (stricter than the standard requirement: radius $\leq 3 \times T$).
- same thickness on the side and corner of the section;
- No residual stress, same structure, same hardness as the base material;

3) SECTION SHAPE: zero eccentricity,

- uniform wall thickness and weight along the whole length of the single tube or hollow section and no differences between one and another,

4) SURFACE: better surface aspect and finishing,

- Scale-free,
- low roughness.





ARVEDI HOLLOW SECTION


SQUARE & RECTANGULAR TUBES *METRIC SIZES (mm)*

Arvedi cold-formed round, square and rectangular structural hollow sections are high frequency induction-welded, made in European formats provided by standard **EN10219-1/2** or according to the customer's drawings or specifications.

Arvedi structural hollow sections are supplied in commercial or customized lengths, (with the option of removal of the internal bead), with plain ends, in the following steel grades:

- non-alloy structural steel grades: S235JR - S275J2H – S355J2H
- fine grain: S275NH – S355NH - S460NH (and NLH)
- fine grain (HSLA): S355MH - S420MH - S460MH (and MLH)
- ultra high strength (UHSS): S500MC - S700MC

and other steel grades with high mechanical characteristics and / or to customer specifications.

For the steel grades included in the standard **EN10219** supplies are  certified and are accompanied by **EN10204** certificate and declaration of performance (in accordance with Regulation EU 305/2011).

Arvedi Tubi Acciaio is CE certified for construction products: **EN 10219 license no. CE 1608 CPR P064**

SQUARE	4,0	4,5	5,0	6,0	8,0	10,0	12,5	14,2	16,0	RECTANGULAR
100x100										120x80
110x110										140x80
120x120										150x100
										160x80
140x140										180x100
										200x80
150x150										200x100
160x160										200x120
180x180										200x150
										250x100
200x200										250x150
										300x100
										300x150
250x250										300x200
300x300										400x200
mm	4,0	4,5	5,0	6,0	8,0	10,0	12,5	14,2	16,0	mm

 AVAILABLE ONLY SQUARE



ARVEDI HOLLOW SECTION

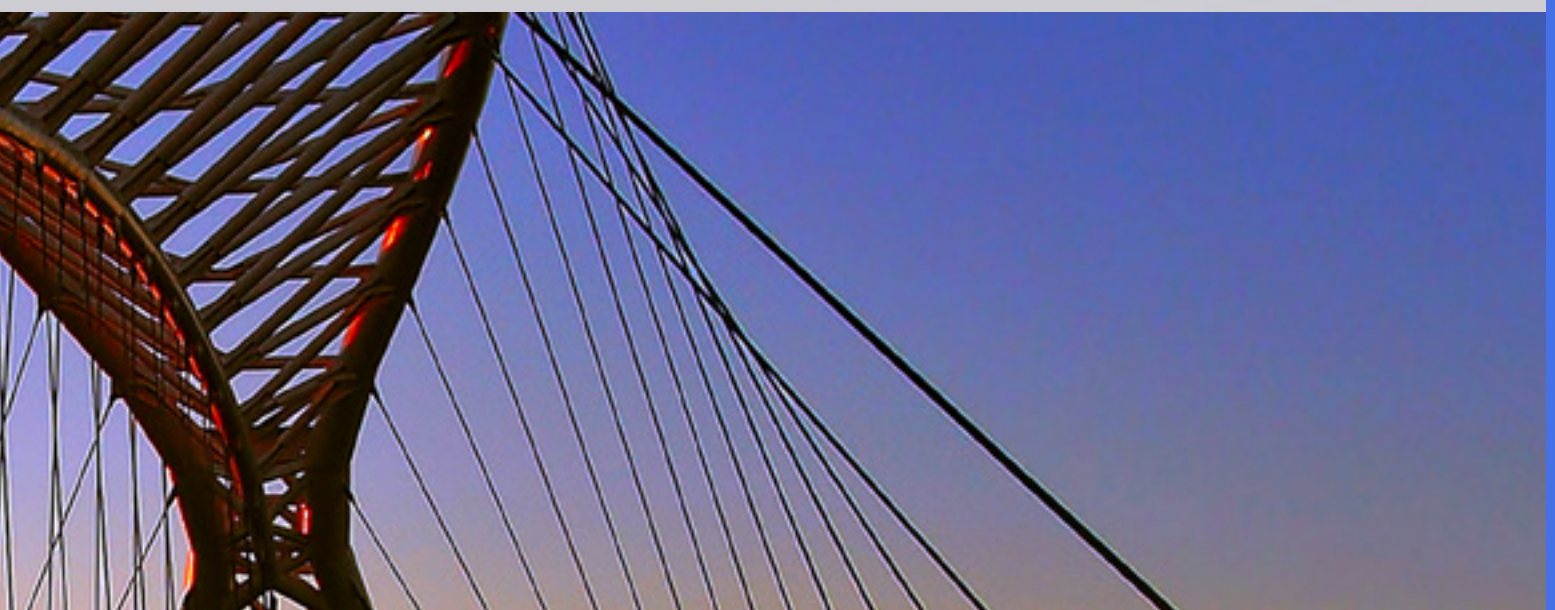
SQUARE AND RECTANGULAR TUBES *IMPERIAL SIZES (inches)*

Arvedi round, square and rectangular structural tubings are cold-formed high frequency induction-welded tubings and made in American formats (imperial sizes) in conformance with standard **ASTM A500** or according to the customer's drawings or specifications. **Arvedi** structural imperial size tubings are supplied in commercial or customized lengths, (with the option of removal of the internal bead) with plain ends in the following steel grades:

- standard: Gr. B - Gr.C
- high strength low alloy (HSLA): 50.000 psi & 60.000 psi minimum yield strength
- ultra high strength (UHSS): 70.000 psi & 100.000 psi minimum yield strength

and other steel grades with specific mechanical characteristics and / or to customer specifications. Tubing supplied are accompanied by a Certificate of Compliance or a Test Report (Material Certificate) as specified in the purchase order.

SQUARE	0.180	0.188	0.250	0.313	0.375	0.500	0.625	RECTANGULAR
4" x 4"								5" x 3"
4.5" x 4.5"								5" x 4"
								6" x 3"
5" x 5"								6" x 4"
5.5" x 5.5"								6" x 5"
								7" x 3"
								7" x 4"
6" x 6"								7" x 5"
								8" x 3"
								8" x 4"
7" x 7"								8" x 6"
								9.5" x 4"
								10" x 3"
								10" x 4"
8" x 8"								10" x 6"
								10" x 8"
								12" x 4"
								12" x 6"
10" x 10"								12" x 8"
12" x 12"								16" x 8"
inches	0.180	0.188	0.250	0.313	0.375	0.500	0.625	inches



ARVEDI PRECISION TUBES

WELDED PRECISION TUBES

Starting from steel strips, produced by **Acciaieria Arvedi**, which guarantee constant mechanical characteristics and close wall thickness tolerances, **ATA** produces high frequency induction welded (HFI) precision tubes in conformance with standard **EN 10305-3** and in accordance with customer specifications.

These tubes, which have the most stringent prescriptions on dimensional tolerances are often processed with deep deformations and the obtained finished products are then frequently subjected to occasional loads or continuous fatigue stress.

Industrial parts, machinery such as rolls, moving structures and crane parts are examples of their applications.

MOTHER SHELL FOR COLD DRAWING

ARVEDI Mother shell for cold drawing represent **ATA's** core business where it is the leading European company and the only independent supplier of these products.

These tubes can be produced as hot stretch-reduced or welded from black or pickled stripe, to standard **EN10305-3**, **EN10210**, **EN 10296** or to customer specification; they are made in a wide range of steel grades and in the full size range of diameters from 17 to 355,6 mm and wall thicknesses from 1.5 to 16 mm.

ARVEDI mother shell are suitable for cold drawing to obtain tubes with close tolerances and low roughness used in particular in the automotive sector and hydraulic and pneumatic industry.



ARVEDI PRECISION TUBES

ARVEDI AUTOMOTIVE TUBES

The high frequency induction welded (HFI) precision tubes produced by **ATA** in accordance with **EN 10305-3** and / or in accordance with customer specifications are used in the car and truck components sector.

Arvedi Tubi Acciaio is an appreciated supplier of the leading car manufacturers and their subcontractors. The quality management system at **Arvedi Tubi Acciaio** in Cremona is certified **IATF 16949**.

Thanks to a team composed of engineers and experts in the sector, it supports customers in the various project phases, from the choice of steel to the development of the product down to the launch of the finished series, guaranteeing efficient after-sales assistance.

Synergy between **Acciaieria Arvedi** and **ATA** leads to the development of specific steel grades dedicated to individual projects.

Once they are series, these grades are produced with innovative **ISP** and **ESP** processes with controlled thickness, mechanical and physical characteristics, properties appreciated by car manufactures which become constancy and uniformity of behavior under processing and then in performances on the vehicle.

Integration upstream with **Acciaieria Arvedi** guarantees short supply times of the raw material and considerable production flexibility.

Integration downstream with **Metalfer Spa** and **Metalfer Automotive** offers the end customers the possibility of receiving the cut-to-size tube on a just-in-time basis.

Subsequent processing carried by the customers includes bending, hydroforming, cold and hot forming and mechanical processing for making small and large series of automotive parts such as axles, camshafts, stabilizing bars, chassis parts, engine and bodywork supports and reinforcements and safety parts.



ARVEDI GEOTECHNICAL SYSTEMS

TUBES FOR CONSOLIDATION

Arvedi Tubi Acciaio is the European leader in the production of hot rolled tubes for the manufacture of self-drilling anchor systems, used for tunnelling and mining consolidation, and for steep slopes and landslides stabilising.

The standard steel grades are **S355J2H, S355 mod., 28MN6, 34MNB5, 38MNB5**. In collaboration with its customers' technical offices **ATA** studies and develops suitably customised and optimised steel grades and specific sizes in order to increase the workability of the anchors and obtain the best performances on site and in operation.

EXPANDABLE ROCK BOLTING SYSTEM

These special section tubes are produced to specific **ATA** specifications and can be supplied as weld or full body normalised.

MICROPILING

Micropiling is produced in compliance with standard **EN 10219** or **EN 10296** in commercial length bars, with the internal bead removed and with smooth ends in the following steel grades:

- **basic steels: S235 – S275 – S355J2**
- **high strength: S420MH – S460MH**
- **ultra-high strength: S500MC – S700MC**
- **other steel grades with high mechanical characteristics: N80**

For the steel grades included in the standard **EN10210** and **EN10219** supplies are **CE** certified and are accompanied by **EN10204** certificate and declaration of performance (in accordance with Regulation EU 305/2011).

Arvedi Tubi Acciaio is CE certified for construction products:

- **EN 10219 license no. CE 1608 CPR P064**
- **EN10210: licenses no. CE 1608 CPR P063 and P157**



APPLICATIONS

ENERGY AND POWER

BOILER TUBES AND HEAT EXCHANGERS

Arvedi tubes for pressure applications are high frequency welded (HFI) products in alloy and non al-alloy carbon steels.

The excellent final characteristics are achieved using raw materials of constant and uniform quality from **Arvedi Acciaieria ATA's** special production equipment which allows close dimensional tolerances to be respected.

The results are better workability and repeatability in the welding, rolling expansion and curving phases. These tubes are mainly used in industrial and domestic boilers, high and low temperatures heat exchangers and in applications for the conveyance of pressurized fluids in the chemical and petrochemical industry.

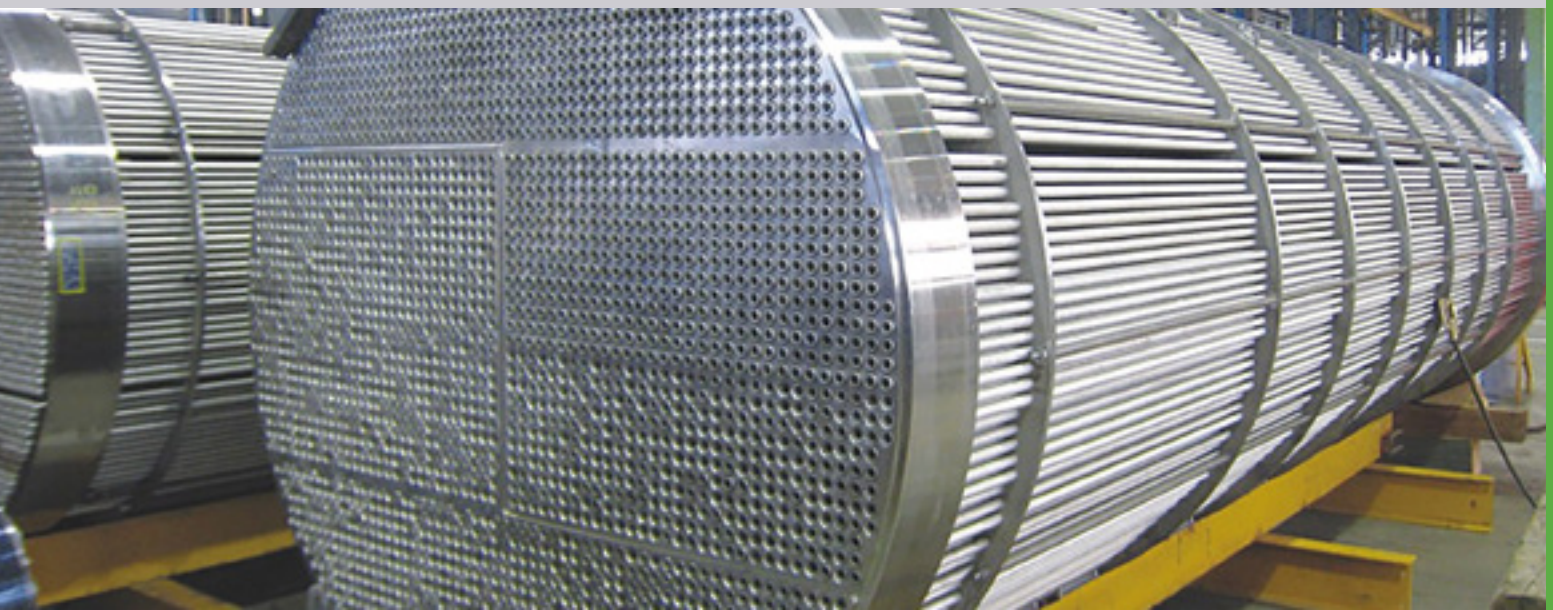
The reference standards are:

- **EN 10217-1 for uses at ambient temperature**
- **EN 10217-2 for uses at high temperatures**
- **EN 10217-3 for fine grain alloyed tubes**
- **EN 10217-4 for uses at low temperatures**
- **ASTMA214 electrically welded carbon steel heat exchangers and condensers**
- **ASTM A178 electrically welded carbon steel tubes for boilers and heat exchangers**

The tubes for pressure applications can be supplied in lengths up to 15 meters and in the following states:

- **welded and calibrated**
- **seam annealed**
- **normalized in a controlled atmosphere**
- **hot rolled**

On request, in the order phase, it can be agreed to supply the tubes by completing the product documentation with **PED** (pressure equipment directive) certification in conformance with the requirements of **PED 2014/68/EU** / or the certification **AD 2000 W4/TRD 102**.



ENERGY AND POWER

DISTRICT HEATING

Arvedi produces and supplies tubes for district heating in line with the provisions of standard **EN253** and stringent customer specifications.

ARVEDI tubes for district heating are welded tubes produced in accordance with the series of standards **EN10217** and can be supplied seam annealed or full body normalized, they are made in steel grades provided by the standards or in special steel grades, in accordance with customer specifications and ensure use in extreme conditions; depending on the application requirements the **ARVEDI** tubes can be supplied in lengths ranging from 6 to 16 meters.

As completion of product documentation **Arvedi Tubi Acciaio** can provide **PED** (pressure equipment directive) certification in compliance with the requirements of European Directive **PED 2014/68/EU**.

WATER PIPE

Arvedi Tubi Acciaio uses high quality carbon steels characterized by excellent physical and mechanical properties.

The repeatability of these characteristics allows tubes to be obtained that are highly weldable and workable in the installation phase.

The water pipes are produced with (HF) longitudinal welding from hot rolled strip, comply with the prescriptions of standard **EN 10224** and can be coated externally with polyethylene and lined internally with epoxy varnish.

Arvedi water pipes are made and supplied in compliance with standard **EN10244** and CE certified and are accompanied by a declaration of performance (as per regulation EU 305/2011).

LINE PIPE

ARVEDI line pipes are tubes destined for conveying pressurized fluids and are typically used in the civil and industrial oil & gas sectors.

These pipes are supplied both bare and coated in polyethylene and are produced and supplied in accordance with standard **API5L** and **ISO3183**.



APPLICATIONS

ENERGY AND POWER

OCTG CASING AND TUBING

OCTG tubes are used in wells and oil & gas production plants; these tubes are produced and supplied in compliance with standards **API5CT** and **ISO11960**. **ATA** produces **OCTG** tubes using high frequency induction welding (HFW) without the addition of filler metals.

Following welding:

- diameters up to 3"; are rolled in a hot stretch-reducing mill;
- diameters over 3 ½"; are normalized along the weld area or full body normalized.

Arvedi tubes are produced in the following Group 1 steel grades:

- **H40 / K55 / J55 / N80**

A particular steel grade is also available:

"J55 upgradable"; developed in collaboration with **Acciaieria Arvedi**, suitable for upgrading to steel grades **N80**, **L80** and **P110**

Production range of **API 5CT**:

TUBING

LABEL diameter	OD		Wall thickness		Weight	
	Inch	mm	Inch	mm	lb/ft	Kg/m
1.050	1.050	26.7	0.113	2.87	1.14	1.70
			0.154	3.91	1.48	2.20
1.315	1.315	33.4	0.133	3.38	1.70	2.53
			0.179	4.55	2.19	3.26
1.660	1.660	42.4	0.125	3.18	2.09	3.05
			0.140	3.56	2.27	3.39
			0.191	4.85	3.03	4.51
1.900	1.900	48.3	0.125	3.18	2.40	3.53
			0.145	3.68	2.72	4.05
			0.200	5.08	3.65	5.43
2.063	2.063	52.4	0.156	3.96	3.24	4.70
			0.225	5.92	4.50	6.74
2 3/8	2.375	60.3	0.167	4.24	4.00	5.95
			0.190	4.83	4.60	6.85
			0.254	6.45	5.80	8.63
2 7/8	2.875	73	0.217	5.51	6.40	9.52
			0.276	7.01	7.80	11.61
3 1/2	3.500	88.9	0.216	5.49	7.70	11.46
			0.254	6.45	9.20	13.69
			0.289	7.34	10.20	15.18
4	4.000	101.6	0.226	5.74	9.50	14.14
			0.262	6.65	10.70	16.36
4 1/2	4.500	114.3	0.271	6.88	12.60	18.75





THE ENVIRONMENT

A CERTIFIED PASSION

The **OHSAS 18001** certified management system involves ownership, management and all employees in a program of continuous improvement to ensure the safety and health of workers.

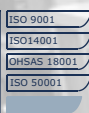
Arvedi Tubi Acciaio's commitment to the protection of the environment is shown not only by the constant monitoring and strict compliance with the emissions standards imposed by national laws and the decrees of regional and local administrations, but also by the fact that it was among the first Italian companies to obtain **ISO 14001** environmental certification.

Still with a view to reducing the impact on the environment, particular efforts are at energy saving and for this reason an energy management system has been implemented, certified in compliance with **ISO 50001**, the aim of which is to constantly improve energy efficiency.

The production of tubes destined for special applications, working in a spirit of innovation in order to improve production process performances, strengthening relations with customers and improving their degree of satisfaction with products and performances in line with expectations, are the results achieved thanks to **ISO 9001** certification, and for automotive products **IATF 16949**.

An important step in the development of its organization was the adoption of the Organization, Management and Control Models as per Decree Law 231/01 and the definition of a Code of Ethics. It adopted clearly and transparently defines the values as a whole which inspire **Arvedi Tubi Acciaio** and are set out in order to establish clear rules of behavior for carrying out its professional activity.

System Certifications



	Certifications	Date first issued	issue by
Quality	ISO 9001	26/01/1987	IGQ
	IATF 16 949	20/11/2001	IGQ
	API Q1	09/01/1985	API
Environment	ISO 14001	12/05/2005	IGQ
Safety	OHSAS 18001	31/12/2009	IGQ
Energy	ISO 50001	03/09/2014	IGQ

Product Certifications



5CT - 0392
5L - 0293



PED 2014/68/EU
54/2002/MUC



AMMM00001HV



1608 CPR P063 EN10210
1608 CPR P157 EN10210
1608 CPR P064 EN10219
1608 CPR P129 EN12899
EN10224
EN10255



www.arvedi.it



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