



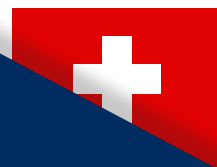
ZWAHLEN & MAYR
ZM TUBES

STAINLESS STEELTUBES



we close the circle!

SWISS
MADE



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100

- Production of welded stainless steel tubes
- Steel constructions

A collage of 12 images illustrating various stages and products of metal processing. The images include: 1) A close-up of metal pipes being processed. 2) A large roll of metal sheet being unrolled. 3) A close-up of a metal pipe being machined. 4) A large roll of metal sheet being unrolled. 5) A close-up of a metal pipe being machined. 6) A large roll of metal sheet being unrolled. 7) A close-up of a metal pipe being machined. 8) A large roll of metal sheet being unrolled. 9) A close-up of a metal pipe being machined. 10) A large roll of metal sheet being unrolled. 11) A close-up of a metal pipe being machined. 12) A large roll of metal sheet being unrolled.

HISTORY

- **1881**
Louis Zwahlen sets up a workshop in Lausanne producing decorative wrought ironwork
- **1918**
Eng. Henri Mayr steers the company's activities towards steel construction
- **1946**
ZWAHLEN & MAYR SA becomes an important competitor in steel construction
- **1964**
The rapid growth of the company necessitates a relocation of production from Lausanne to Aigle
- **1979**
WELED STAINLESS STEEL TUBE department is set up
- **1990**
New production line for REDRAWN TUBES
- **1994**
2 new welding lines are installed: after 12 years the annual production reaches volumes between 1,000 and 1,500 tons
- **2002**
A new investment: ZM purchases from its main competitor complete redrawn tubes production line with a new 2,100 - sqm production site
- **2010**
Acquisition of coil slitting machine in order to slit 1,500 mm wide coils of 20 tons
- **2012**
Acquisition by Italian Group CIMOLAI Spa
- **2015**
New investments: extension of production site up to 4,000 - sqm and new laser or TIG lines up to 114 mm
- **2017**
New off-line furnace for redrawn tubes with outstanding capacity increase and degreasing machine
- **2018**
New TIG welding lines for diameters of 12 to 63,5 mm



**CIMOLAI**

**ZM**
ZWAHLEN & MAYR

**ZM**
CONSTRUCTIONS
MÉTALLIQUES

**ZM**
ZWAHLEN & MAYR
ZM TUBES

Buildings

Bridges

Special constructions

Welded tubes for
heat exchanger
(1979)

High precision welded
redrawn tubes
(1990)

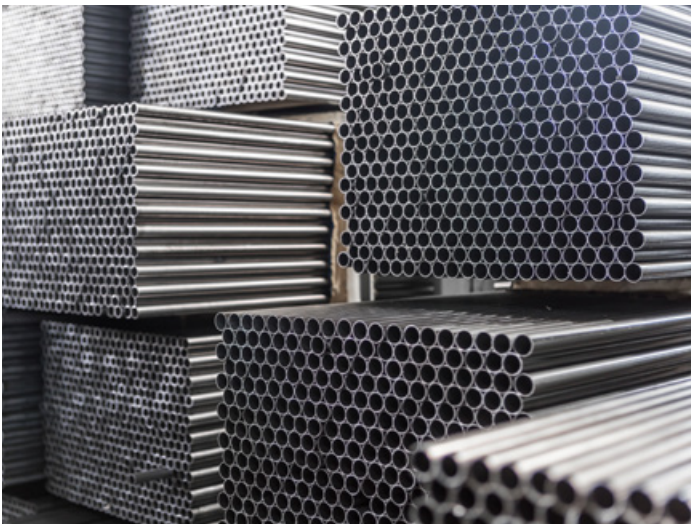
ZM TUBES PRODUCTS

ZM Tubes manufactures two types of stainless steel tubes: standard welded and welded-redrawn for high precision applications.

These tubes are used in a wide range of applications as heat exchangers, condensers, evaporators, feed water heaters for power plants and equipment in the food industry as well as in the pharmaceutical, pneumatic, automotive, instrumentation, oil & gas, valves and aerospace industries.

STAINLESS STEEL GRADES

- **Austenitic**
304/304L/316/316L/316SL/316Ti
321/317L/317LN
- **Super Austenitic**
904L/254SMO/N08926/N08800/AL6XN
- **Duplex**
S32101/S32304/S32205/
S31803/S32750/S32760
- **Inconel**
600/601/602/625/825
- **Ferritic**
S44100/S44400/S43035
- **Heat resisting steels**
310S/321H/304H
- **Incoloy + Hastelloy**
on request



RANGE	DIAMETER		THICKNESS		LENGTH	
	mm	inch	mm	inch	mm	inch
Longitudinally welded stainless steel tubes	12 - 114.3	0.472" - 4.5"	0.50 - 4	0.02" - 0.157"	up to 30 m	up to 100 ft
Longitudinally welded and re-drawn stainless steel and Nickel alloys tubes	5 - 105	0.196" - 4.13"	0.30 - 3	0.01" - 0.118"	from 4 mm	from 0.157"

MATERIAL GRADES

Austenitic steel Cr - Ni

WN	Name Nom	EN Grade	AISI / UNS	C %	Si %	Mn %	S %	N %	Cr %	Cu %	Mo %	Ni %	Ti %	Others Andere Autres
1.4301	AISI 304	X5CrNi18-10 (X4CrNi18-10)	304 / S30400	≤ 0,07	≤ 1,00	≤ 2,00	≤ 0,015	≤ 0,11	17,00 - 19,50	-	-	8,00 - 10,50	-	-
1.4306	AISI 304L	X2CrNi19-11	304L / S30403	≤ 0,030	≤ 1,00	≤ 2,00	≤ 0,015	≤ 0,11	18,00 - 20,00	-	-	10,00 - 12,00	-	-
1.4307	AISI 304L	X2CrNi18-9	304L / S30403	≤ 0,030	≤ 1,00	≤ 2,00	≤ 0,015	≤ 0,11	17,50 - 19,50	-	-	8,00 - 10,00	-	-
1.4541	AISI 321	X6CrNiTi18-10	321 / S32100	≤ 0,08	≤ 1,00	≤ 2,00	≤ 0,015	-	17,00 - 19,00	-	-	9,00 - 12,00	Ti 5 x C max 0,7	-

Austenitic steel Cr - Ni - Mo

WN	Name Nom	EN Grade	AISI / UNS	C %	Si %	Mn %	S %	N %	Cr %	Cu %	Mo %	Ni %	Ti %	Others Andere Autres
1.4401	AISI 316	X5CrNiMo17-12-2 (X4CrNiTi 17-12-2)	316 / S31600	≤ 0,07	≤ 1,00	≤ 2,00	≤ 0,015	≤ 0,11	16,50 - 18,50	-	2,00 - 2,50	10,00 - 13,00	-	-
1.4404	AISI 316L	X2CrNiMo17-13-2 (X2CrNiMo17-12-2)	316L / S31603	≤ 0,03	≤ 1,00	≤ 2,00	≤ 0,015	≤ 0,11	16,50 - 18,50	-	2,00 - 2,50	10,00 - 13,00	-	-
1.4432	AISI 316L	X2CrNiMo17-12-3	316L	≤ 0,03	≤ 1,00	≤ 2,00	≤ 0,015	≤ 0,11	16,50 - 18,50	-	2,50 - 3,00	10,50 - 13,00	-	-
1.4435	AISI 316L	X2CrNiMo18-14-3	316L	≤ 0,03	≤ 1,00	≤ 2,00	≤ 0,015	≤ 0,11	17,00 - 19,00	-	2,50 - 3,00	12,50 - 15,00	-	-
1.4436	AISI 316	X5CrNiMo17-13-3 (X4CrNiMo17-13-3)	316	≤ 0,05	≤ 1,00	≤ 2,00	≤ 0,015	≤ 0,11	16,50 - 18,50	-	2,50 - 3,00	10,50 - 13,00	-	-
1.4438	AISI 317L	X2CrNiMo18-16-4 (X2CrNiMo18-15-4)	317L / S31703	≤ 0,03	≤ 1,00	≤ 2,00	≤ 0,015	≤ 0,11	17,50 - 19,50	-	3,00 - 4,00	13,00 - 16,00	-	-
1.4439	AISI 317LN	X2CrNiMoN17-13-5	317LN / S31753	≤ 0,03	≤ 1,00	≤ 2,00	≤ 0,015	0,12-0,22	16,50 - 18,50	-	4,00 - 5,00	12,50 - 14,50	-	-
1.4571	AISI 316 Ti	X6CrNiMoTi17-12-2	316Ti / S31635	≤ 0,08	≤ 1,00	≤ 2,00	≤ 0,015	-	16,50 - 18,50	-	2,00 - 2,50	10,50 - 13,50	Ti 5 x C max 0,70	-

Duplex steel

WN	Name Nom	EN Grade	AISI / UNS	C %	Si %	Mn %	S %	N %	Cr %	Cu %	Mo %	Ni %	Ti %	Others Andere Autres
1.4162	2101® Lean Duplex	-	S32101	≤ 0,040	≤ 1,00	4,00 - 6,00	≤ 0,30	0,20 - 0,25	21,0 - 22,0	0,10 - 0,80	0,10 - 0,80	1,35 - 1,70	-	-
1.4362	Alloy 2304 Lean Duplex	X2CrNiN23-4	S32304	≤ 0,030	1,00	2,00	0,015	0,05 - 0,20	22,00 - 24,00	0,10 - 0,60	0,10 - 0,60	3,50 - 5,50	-	-
1.4462	Alloy 2205 Duplex	X2CrNiMoN22-5-3	S32205	≤ 0,030	1,00	2,00	0,02	0,14 - 0,20	22,00 - 23,00	-	3,00 - 3,50	4,50 - 6,50	-	-
1.4462	Alloy 2205 Duplex	X2CrNiMoN22-5-3	S31803	≤ 0,030	1,00	2,00	0,02	0,08 - 0,22	21,00 - 23,00	-	2,50 - 3,50	4,50 - 6,50	-	-
1.4410	Alloy 2507 Super Duplex	X2CrNiMoN25-7-4	S32750	≤ 0,030	≤ 1,00	≤ 2,00	≤ 0,015	0,20 - 0,35	24,0 - 26,0	-	3,00 - 4,50	6,00 - 8,00	-	-
1.4501	F55 Super Duplex	X2CrNiMoCuWN25-7-4	S32760	≤ 0,030	≤ 1,00	≤ 1,00	≤ 0,015	0,20 - 0,30	24,0 - 26,0	0,50 - 1,00	3,00 - 4,00	6,00 - 8,00	-	W 0,50 - 1,00

MATERIAL GRADES

Super austenitic steel														
WN	Name Nom	EN Grade	AISI / UNS	C %	Si %	Mn %	S %	N %	Cr %	Cu %	Mo %	Ni %	Ti %	Others Andere Autres
1.4539	AISI 904L	X1NiCrMoCuN25-20-5	904L / N08904	≤ 0,020	≤ 0,70	≤ 2,00	≤ 0,010	≤ 0,15	19,00 - 21,00	1,20 - 2,00	4,00 - 5,00	24,00 - 26,00	-	-
1.4547	Alloy 254 SMO	X1CrNiMoCuN20-18-7	S31254	≤ 0,020	≤ 0,70	≤ 1,00	≤ 0,010	0,18-0,25	19,50 - 20,50	0,50 - 1,00	6,00 - 7,00	17,50 - 18,50	-	-
1.4529	Alloy 6Mo	X1NiCrMoCuN25-20-6 (X1NiCrMoCuN25-20-7)	N08926	≤ 0,020	≤ 1,00	≤ 2,00	≤ 0,015	0,10-0,25	19,00 - 21,00	0,50 - 1,50	6,00 - 7,00	24,00 - 26,00	-	-
1.4876	Alloy 800	X10NiCrAlTi32-20	N08800	0,05-1,00	≤ 1,00	≤ 1,50	≤ 0,015	-	19,00 - 23,00	≤ 0,75	-	30,00 - 34,00	0,15 - 0,60	Al 0,15 - 0,60
-	AL6XN ®	-	N08367	≤ 0,030	≤ 1,00	≤ 2,00	≤ 0,030	0,18-0,25	20,00 - 22,00	≤ 0,75	6,00 - 7,00	23,50 - 25,50	-	Fe Bal.

High nickel alloy														
WN	Name Nom	EN Grade	UNS	C %	Si %	Mn %	S %	N %	Cr %	Cu %	Mo %	Ni %	Ti %	Others Andere Autres
2.4816	Alloy 600	NiCr15Fe	N06600	0,05 - 0,10	≤ 0,50	≤ 1,00	≤ 0,015	-	14,00 - 17,00	≤ 0,5	-	71,0 - 80,0	≤ 0,3	Fe 6,0-10,0 Al ≤ 0,3 B ≤ 0,006 Co ≤ 1,0
2.4851	Alloy 601	NiCr23Fe	N06601	≤ 0,10	≤ 0,50	≤ 1,00	≤ 0,015	-	21,00 - 25,00	≤ 0,5	-	58,00 - 63,00	≤ 0,5	-
2.4856	Alloy 625	NiCr22Mo9Nb	N06625	0,03-0,10	≤ 0,50	≤ 0,50	≤ 0,015	-	20,00 - 23,00	≤ 0,5	8,00 - 10,00	≥ 58	≤ 0,4	-
2.4633	Alloy 602	NiCr25FeAlY	N06025	≤ 0,15	≤ 0,50	≤ 0,50	≤ 0,01	-	24,00 - 26,00	≤ 0,10	-	60,0 - 65,0	0,10 - 0,20	Al 0,15 - 0,60
2.4858	Alloy 825	NiCr 21 Mo	N08825	0,02	≤ 0,50	≤ 1,00	≤ 0,015	-	19,5 - 23,5	1,5-3,0	2,5 - 3,5	38,0 - 46,0	0,6 - 1,2	Fe Bal.
2.4602	Alloy C22	NiCr21Mo14W	N06022	≤ 0,01	-	-	-	-	20.00-22.50	-	12.5-14.5	50,00-63,00	0,60-1,20	-
2.4819	Alloy C276	NiMo16Cr15W	N10276	≤ 0,01	-	-	-	-	15,00-16,50	-	15,0-17,0	51,00-63,00	-	-

Main specifications			
Heat exchangers		Dairy	Pharmaceutical
EN 10217-7		EN 10357	
ASTM A249		ASTM A270	
ASTM A269			DIN 11866 H2 Ra 0,8 - 1,6* H3 Ra 0,8 - 0,8* H4 Ra 0,4 - 0,4* *on welding area
ASTM A688	Bending		
ASTM A789	Alloys Duplex		
ASTM B674	Alloys 904L, 254SMO		
ASTM B676	Alloy AL-6XN		
ASTM B626	Alloys C-276, C-22, 825		
ASTM B704	Alloys 625, 825		
		ASME BPE SF1 Ra μm 0,51 μ-in 20 SF2 Ra μm 0,64 μ-in 25 SF3 Ra μm 0,76 μ-in 30	

WELDED TUBES

PROCESS AND CHARACTERISTICS

Since ZM Tubes is equipped with its own coil slitting line, it is fully flexible of modifying the final diameter at the very last moment. Strips are first formed along the width and then TIG (tungsten inert gas) or laser welded at the edges along the length. Welding is carried out without any filling material.

Strong corrosion resistance, precise forming, excellent roughness of surface even along the welding area are the keys to success that make ZM Tubes a world-class supplier for heat exchangers, evaporators, condensers and feed water heaters.

We deliver both straight and U-bent tubes with a length of up to 30 meters.

APPLICATIONS

- Conventional power stations
- Nuclear power stations
- Chemical and petrochemical plants
- Petroleum refineries
- Pulp & Paper
- Air treatment
- Dairy



PRODUCTION RANGE

- Longitudinally welded stainless steel tubes:
Diameters 12 -114.3 mm 0.472 - 4.50 inch
Thickness 0.50 - 4.00 mm 0.02 - 0.157 inch
Length up to 30 m up to 100 ft
U-bent tubes



TRANSPORT TRUCK 30 METERS LONG

WELDED TUBES



WELDED REDRAWN TUBES

PROCESS AND CHARACTERISTICS

Precision is not a matter of chance at Zwahlen & Mayr!

Thanks to **40 years of "Swiss made" expertise**, using highly skilled staff and continually investing in technological and solution improvements, we have managed to maintain our position at the highest level of redrawn precision technology.

Our mission is to produce state-of-the-art precision tubes, satisfying customer needs and developing worldwide long-term partnerships. Our stainless steel welded tubes are fully manufactured "in house" - from mother coil slitting up to standard welded tubes - which **guarantees constant mechanical parameters, specific surface roughness and tight dimensional tolerances**. These tubes then go through a special redrawing process in order to achieve extreme precise characteristics as:

- Narrow dimensional tolerances
- Ultra smooth surface with specific roughness outside and inside
- Specific mechanical values
- Very short tubes (min. 4 mm - 0.157 inch)

Outside surface tubes are supplied with different finish such as BA - bright annealed or polished

APPLICATIONS

- Automotive and aerospace
- Pharma, food and chemical industry
- Mechatronics
- Pneumatic
- Oil & Gas
- Instrumentation
- Several critical industrial purposes

PRODUCTION RANGE

- Re-drawn stainless steel tubes:
Diameters 5.00 - 105.00 mm **0.196 - 4.13 inch**
Thickness 0.30 - 3.00 mm **0.01 - 0.118 inch**
Length from 4 mm **from 0.157 inch**



WELDED REDRAWN TUBES



CERTIFICATION & QUALITY CONTROL

Inspection and tests are in accordance with the execution standard. Samples are taken during the manufacturing process to carry out mechanical and metallurgical tests.

Tubes are always double Eddy-Current tested:

- E-C on-line right after welding
- E-C off-line at the end of the production cycle

All materials are supplied with work certificates according to EN 10204 3.1 or 3.2 (on request).

Tubes may be made available to third party inspection agencies such as TÜV or Lloyd's.

CERTIFICATIONS

- ISO 9001
- ISO 14001
- TÜV AD 2000 W0
- Lloyd's Register approval certificate n° 943175
- IATF 16949
- TÜV PED 97/23/EC

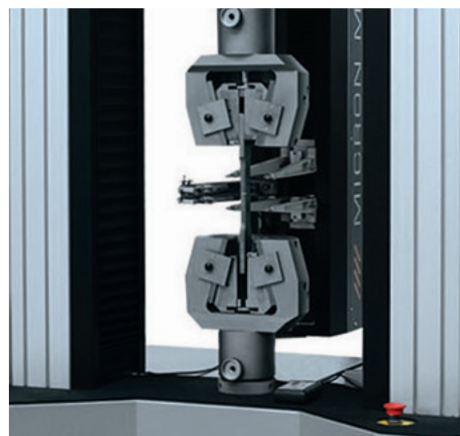


NON-DESTRUCTIVE TEST METHODS

- Eddy Current test
- Visual examination
- Endoscopic test
- Liquid penetrant test
- Hydrostatic test
- Pneumatic test
- Differential pressure test

MECHANICAL & TECHNOLOGIC TEST METHODS

- Hardness test
- Intergranular corrosion test
- Macrographic and micrographic examinations
- Measurement of ferrite content
- Measure of roughness
- Spectrometric chemical analysis
- Specific tests for the power plant industry



MARKETS

CHEMICAL &
PETROCHEMICAL



PHARMACEUTICAL



HEAT EXCHANGERS



INSTRUMENTATION



ELECTROMAGNETIC



PNEUMATIC



FOOD INDUSTRY



POWER
PLANTS

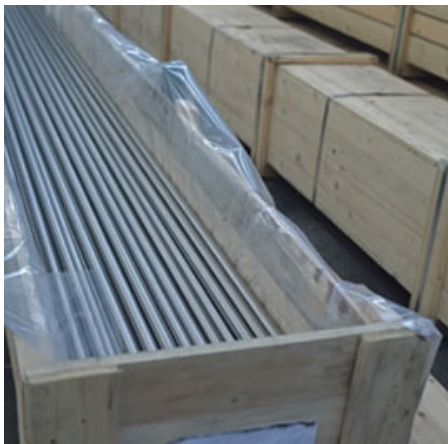
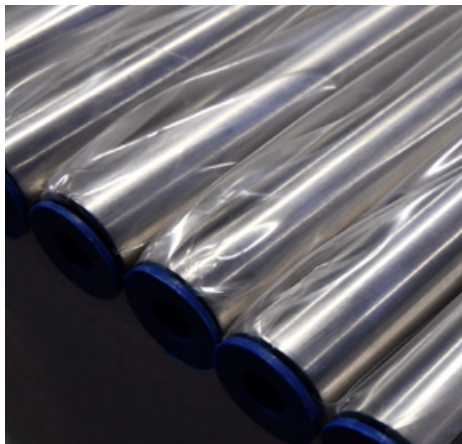
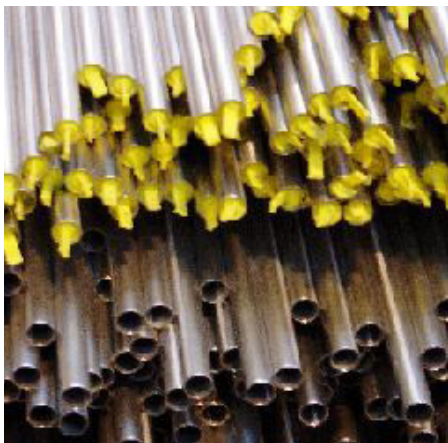
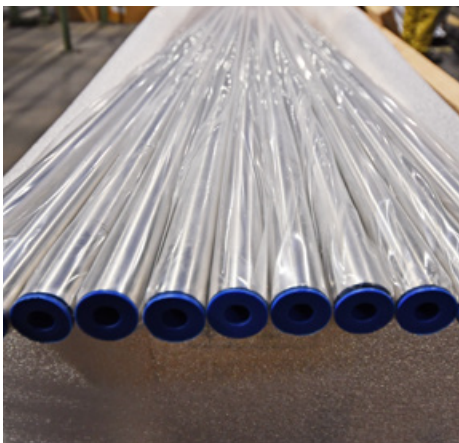
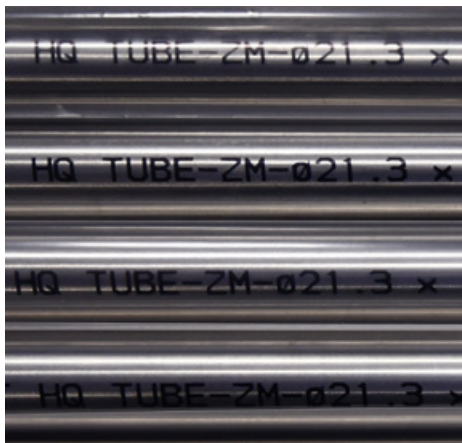
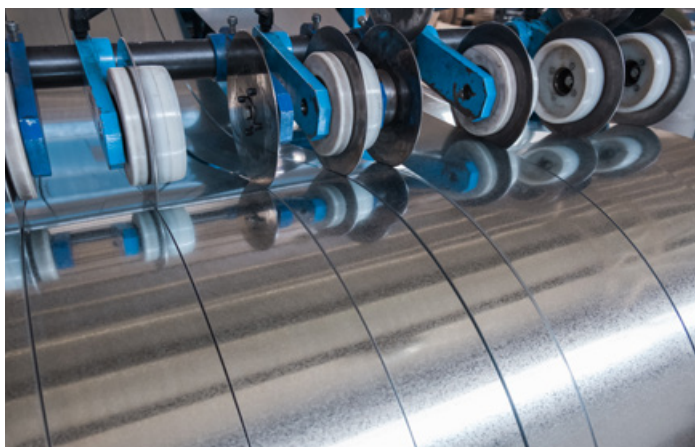


AUTOMOTIVE



AIR COOLERS

OUR PRODUCTS





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ZM TUBES



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