

A large stack of carbon steel cold-drawn welded tubes in a warehouse. The tubes are arranged in a grid pattern, with many more stacks visible in the background. The lighting is dramatic, highlighting the circular openings of the tubes.

**MARCEGAGLIA
CARBON STEEL**

COLD-DRAWN WELDED TUBES

INDEX

- MARCEGAGLIA GROUP
- MARCEGAGLIA COLD-DRAWN WELDED TUBE PRODUCTION
- MANUFACTURING PROCESS
- MARKET DEVELOPMENT AND KEY FACTORS
- PRODUCT RANGE AND TYPICAL APPLICATIONS

MARCEGAGLIA GROUP



GLOBAL PLAYER IN STEEL

5.3 BILLION EURO SALES

MARCEGAGLIA HOLDING

OF WHICH 5.1 BILLION EURO SALES

MARCEGAGLIA STEEL

5.8 MILLION TONS

PROCESSED YEARLY

6,500 EMPLOYEES

25 STEEL PLANTS

60 SALES OFFICES

1° INDEPENDENT PLAYER

IN STEEL PROCESSING SECTOR IN THE WORLD

1° PRODUCER OF STAINLESS STEEL WELDED TUBES

IN THE WORLD

1° PRODUCER OF CARBON STEEL WELDED TUBES

IN EUROPE

1° SERVICE CENTER IN ITALY

STEEL CORE

FIN. MAR.

MARFIN

Staff Corporate

MARCEGAGLIA HOLDING

MARCEGAGLIA STEEL

MARCEGAGLIA INVESTMENTS

MARCEGAGLIA RAVENNA

MARCEGAGLIA CARBON STEEL

MARCEGAGLIA GAZOLDO INOX

MARCEGAGLIA SPECIALTIES

MARCEGAGLIA PLATES

CARBON STEEL FLAT PRODUCTS

CARBON STEEL FLAT PRODUCTS

CARBON STEEL WELDED TUBES

STAINLESS STEEL FLAT PRODUCTS

STAINLESS STEEL PRODUCTS

COLD-DRAWN BARS

HEAVY PLATES

BUILDING

HOME PRODUCTS

ENERGY

ENGINEERING

HOSPITALITY ACTIVITIES & REAL ESTATE

OTHER PARTICIPATIONS

EMPLOYEES	TURNOVER (M/€)		PRODUCTION (KT/y)	
4,300	3,450 TOTAL		4,650 TOTAL	
	2,300 FLAT PRODUCTS	1,150 WELDED TUBES	3,100 FLAT PRODUCTS	1,550 WELDED TUBES

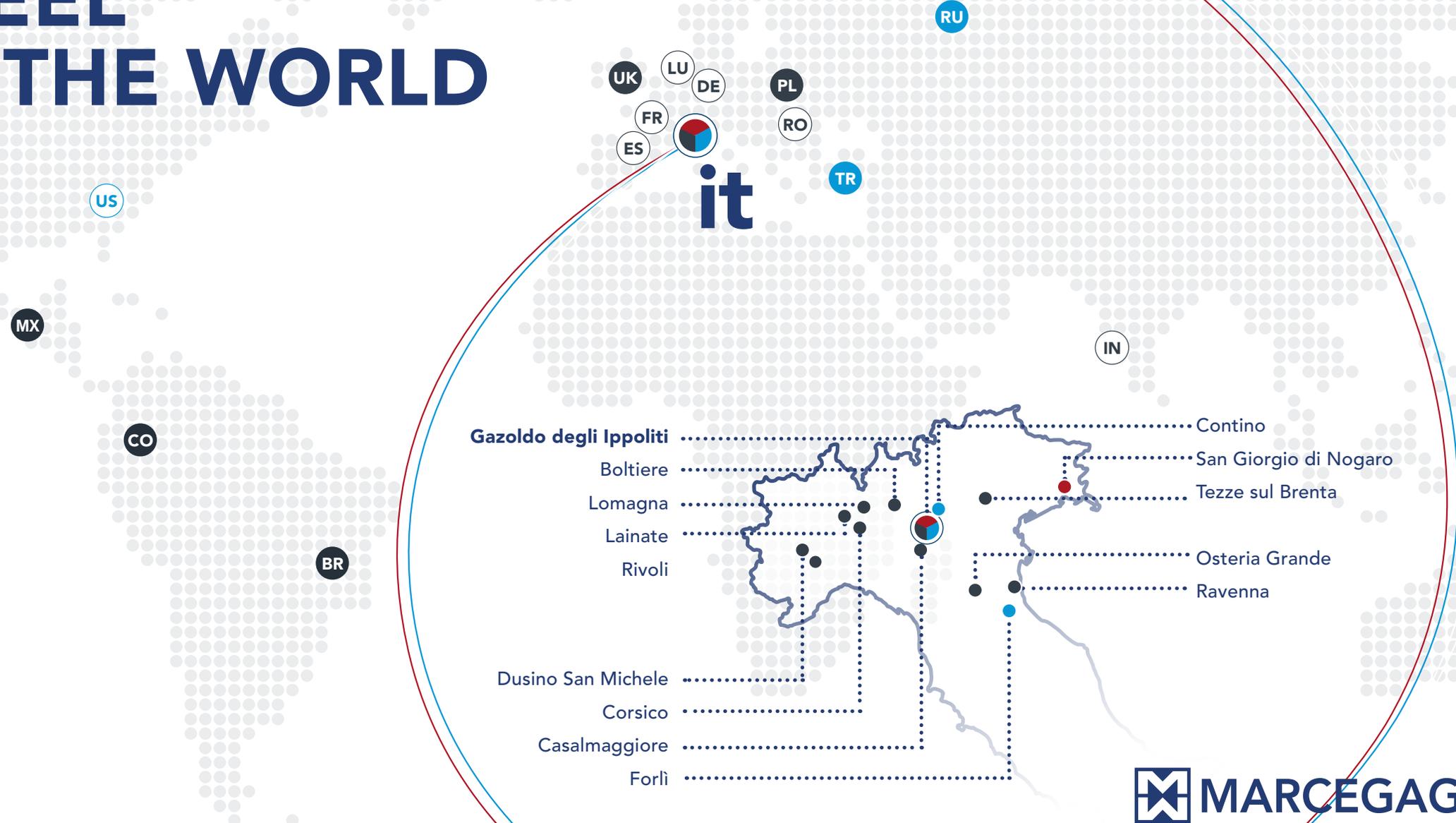
E	T (M/€)		P (KT/y)	
1,000	1,350 TOTAL		700 TOTAL	
	1,200 STAINLESS STEEL PRODUCTS	150 COLD-DRAWN BARS	500 STAINLESS STEEL PRODUCTS	200 COLD-DRAWN BARS

E	T (M/€)	P (KT/y)
100	250	400

D	T (M/€)	P (KT/y)
1,100	250	50

MARCEGAGLIA

STEEL IN THE WORLD

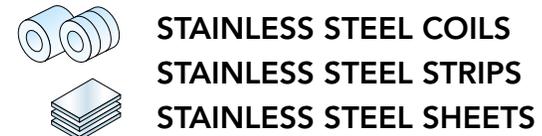


PRODUCT RANGE

MARCEGAGLIA CARBON STEEL



MARCEGAGLIA SPECIALTIES



MARCEGAGLIA COLD-DRAWN WELDED TUBE PRODUCTION

PRODUCTION

BOLTIERE

RIVOLI

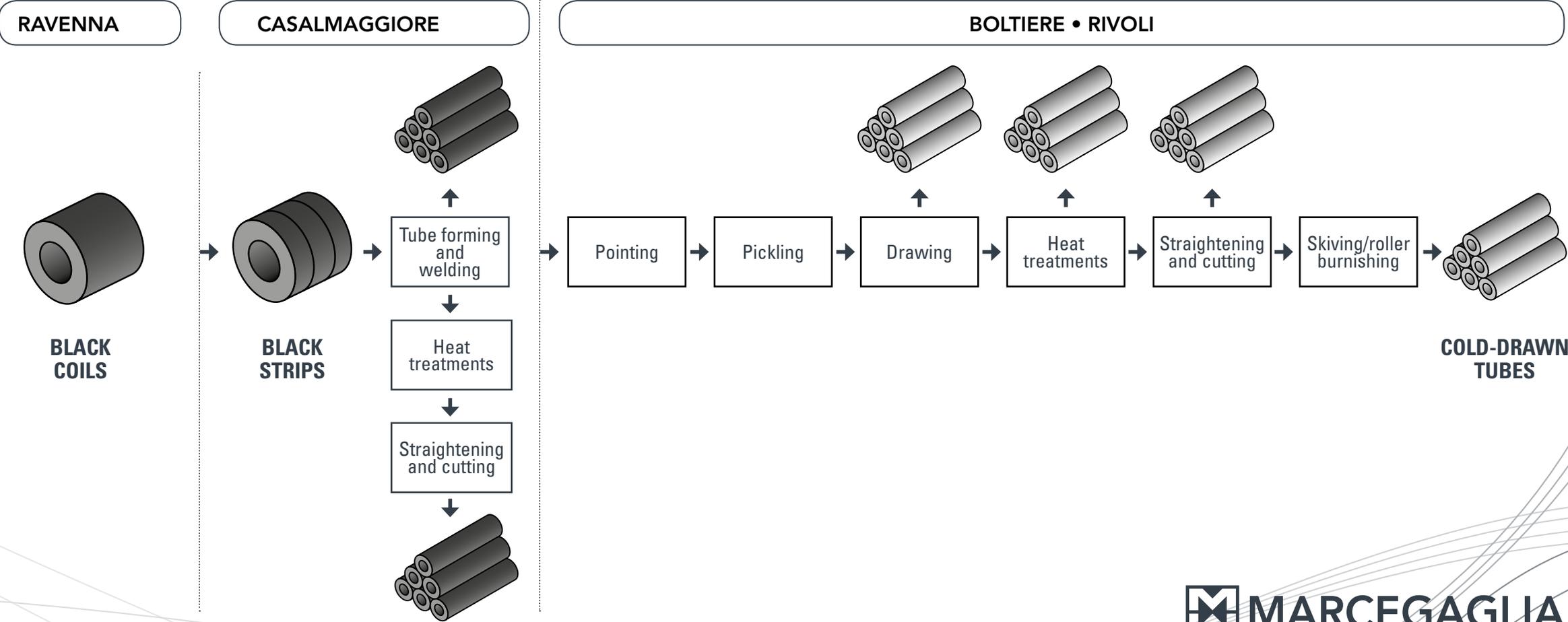
Gazoldo degli Ippoliti

Marcegaglia Carbon Steel cold-drawn welded tubes production takes place in the **Boltiere** and **Rivoli** plants, with a total production capacity of about 100,000 tons.



MARCEGAGLIA
CARBON STEEL

AN INTEGRATED PRODUCTION CHAIN



MARCEGAGLIA BOLTIERE

The Marcegaglia plant in Boltiere (Bergamo) is dedicated to the production of welded and seamless cold-drawn tubes for automotive, hydraulic and mechanical applications.

Marcegaglia Boltiere stands out as one of the largest cold-drawn tube production plants in Europe, in terms of production capacity and product range, with a global distribution.

65,000 MQ
TOTAL AREA

42,000 MQ
COVERED AREA

215 EMPLOYEES

 **MARCEGAGLIA**
CARBON STEEL

MARCEGAGLIA-NOVERO

55,000 MQ
TOTAL AREA

27,000 MQ
COVERED AREA

75 EMPLOYEES

In June 2018, the Marcegaglia group completed the acquisition of Novero Spa, a company based in Rivoli (Turin) specialized in the production of welded and seamless precision cold-drawn tubes in all varieties of carbon and low- and medium-alloy steels.

 **MARCEGAGLIA**
CARBON STEEL

QUALITY AND ENVIRONMENT

The production chain of Marcegaglia Carbon Steel cold-drawn tubes is **ISO 9001:2015** and **IATF 16949:2016** certified.

In 2019 RINA awarded the Boltiere plant "**Best4 ISO 26000:2010**" certification, reserved for companies certified in the Quality, Environment, Safety and Social Responsibility sectors (ISO 9001, ISO 14001, BS OHSAS 18001 and ISO 26000:2010).

The Boltiere plant, like other companies in the Marcegaglia group, is also **ISO 50001:2011** certified for energy.



MANUFACTURING PROCESS

PRODUCTION AREAS



The Marcegaglia plants are equipped with a total of:

- **18 drawing banches** (including 4 automated lines)
- **4 heat treatments lines**
- **5 non destructive test lines**
- different **finishing lines**
- **6 skiving and roller burnishing machines**

THE PRODUCTION PROCESS

TRANSFORMATION

Pointing



Pickling



Drawing



Heat treatments



FINISHING

Straightening



Cutting



ND Test



Packaging



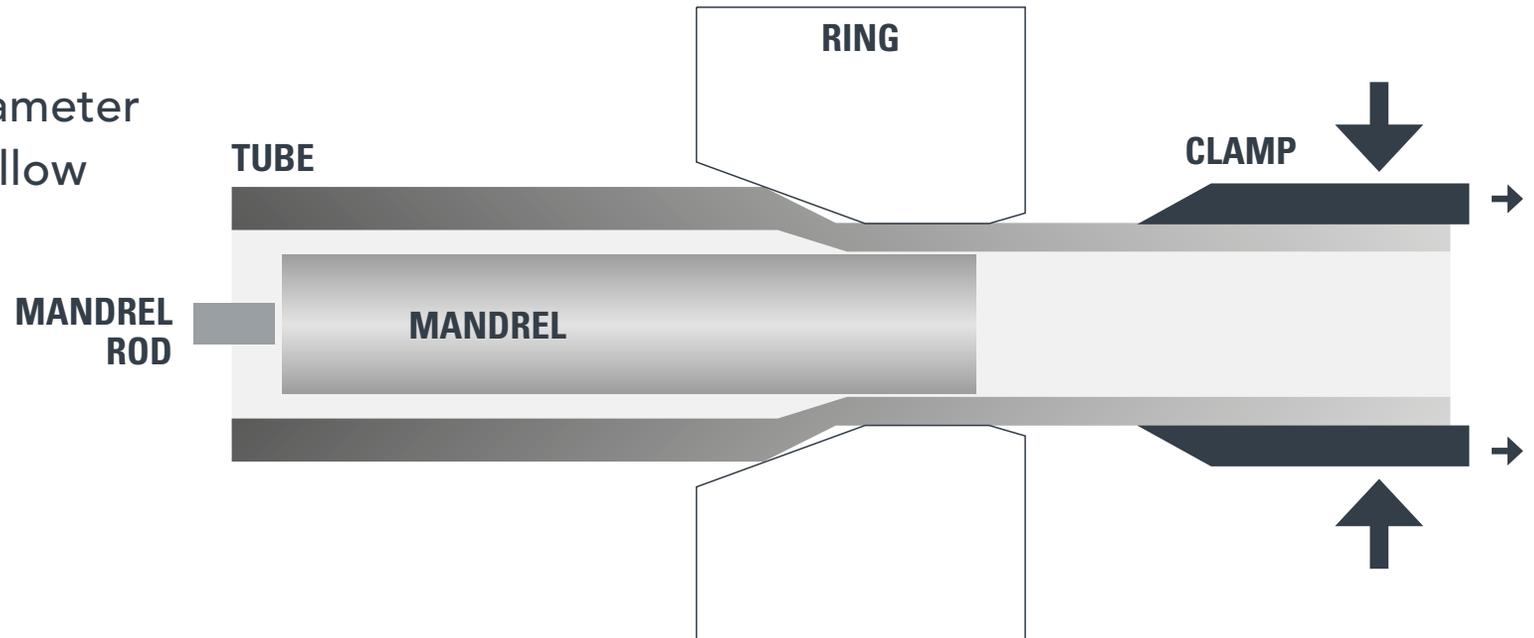
Skiving/roller burnishing



MARCEGAGLIA
CARBON STEEL

COLD-DRAWING PROCESS

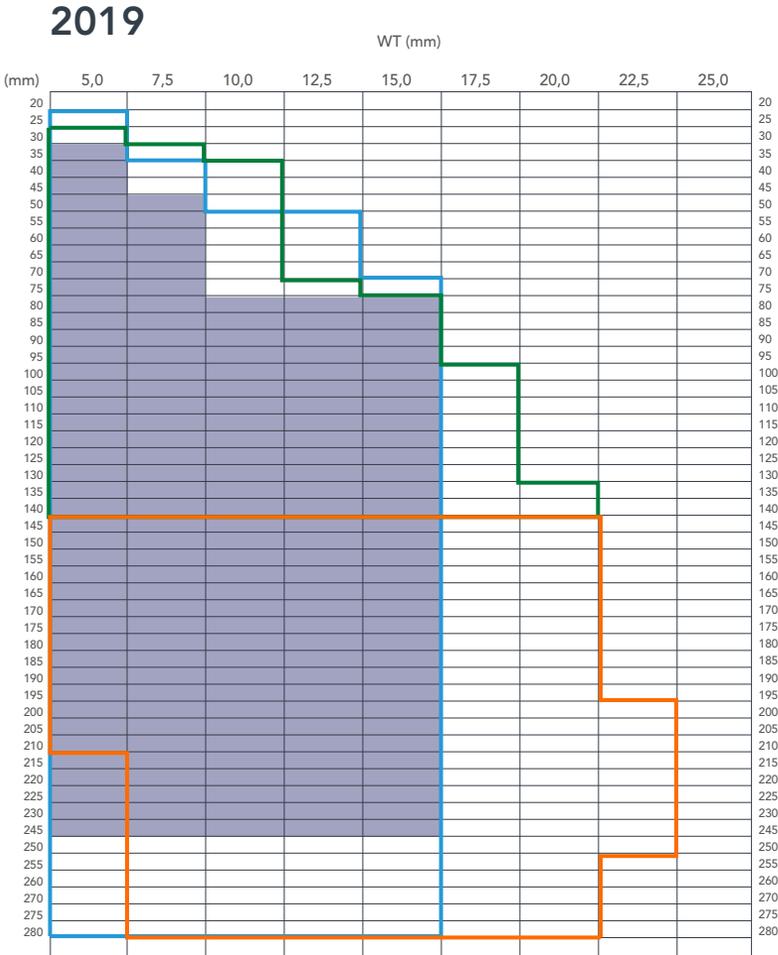
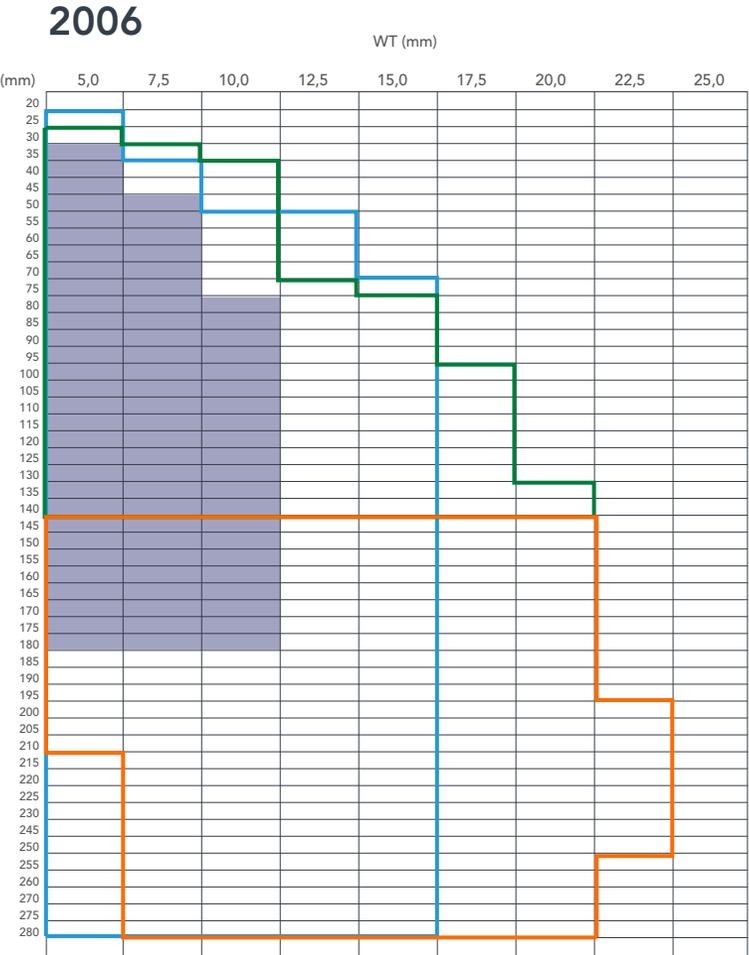
The cold drawing process is a cold reduction of the outside diameter and wall thickness of the starting hollow (Drawn Over the Mandrel).



MARKET DEVELOPMENT AND KEY FACTORS

MARKET DEVELOPMENT

COLD-DRAWN WELDED TUBE

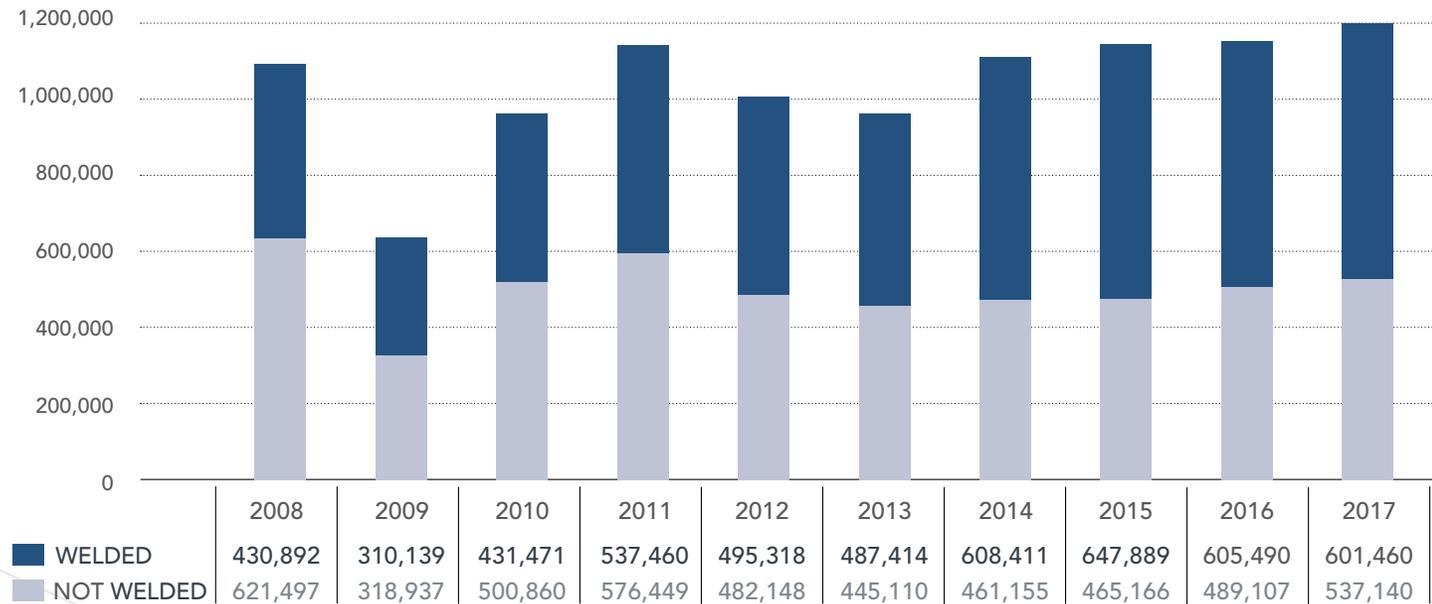


- EU seamless producer 1
- EU seamless producer 2
- USA welded producer
- Marcegaglia

MARKET SEGMENTATION

2008-2017

EU28 - COLD-DRAWN WELDED TUBES PRODUCTION (TONS)



Since 2012, the quantity of cold-drawn tubes produced from welded tubes has exceeded that of products from seamless tubes.

Source: ESTA

FEATURES AND BENEFITS

- Full body normalizing of the shell stock after welding ensures that both the welding and the surrounding areas are **metallographically and mechanically homogeneous with the rest of the tube**
- **Improved quality surface** (less defect after painting and consequently improved fatigue life)
- **Reduce eccentricity** → The eccentricity is 3% max (better roundness OD / ID)
- Tubes are **100 % controlled** by ultrasonic test (full body)
- **Good toughness** at low temperatures

FEATURES AND BENEFITS

- Today the WE production range is covering 80% of the HYCY market
- The main end user has already shifted from SS to Welded 100% (Caterpillar, J.C.B., etc.)
- Benefits are mainly technical, but also the production costs (not price) are lower
- Total cost of the finished product (cylinder) is lower due to less machining

PRODUCT RANGE AND TYPICAL APPLICATIONS

PRODUCT RANGE

18-245 MM

OUTSIDE DIAMETER MIN-MAX

1.5-15 MM

THICKNESS

**SUPERIOR THICKNESSES
ON REQUEST
(IN EXECUTION SEAMLESS)**

Marcegaglia Carbon Steel offers a **wide range** of precision cold-drawn tubes, welded and seamless, in all carbon steel and low-alloy steel varieties.

 **MARCEGAGLIA**
CARBON STEEL

TYPICAL APPLICATIONS

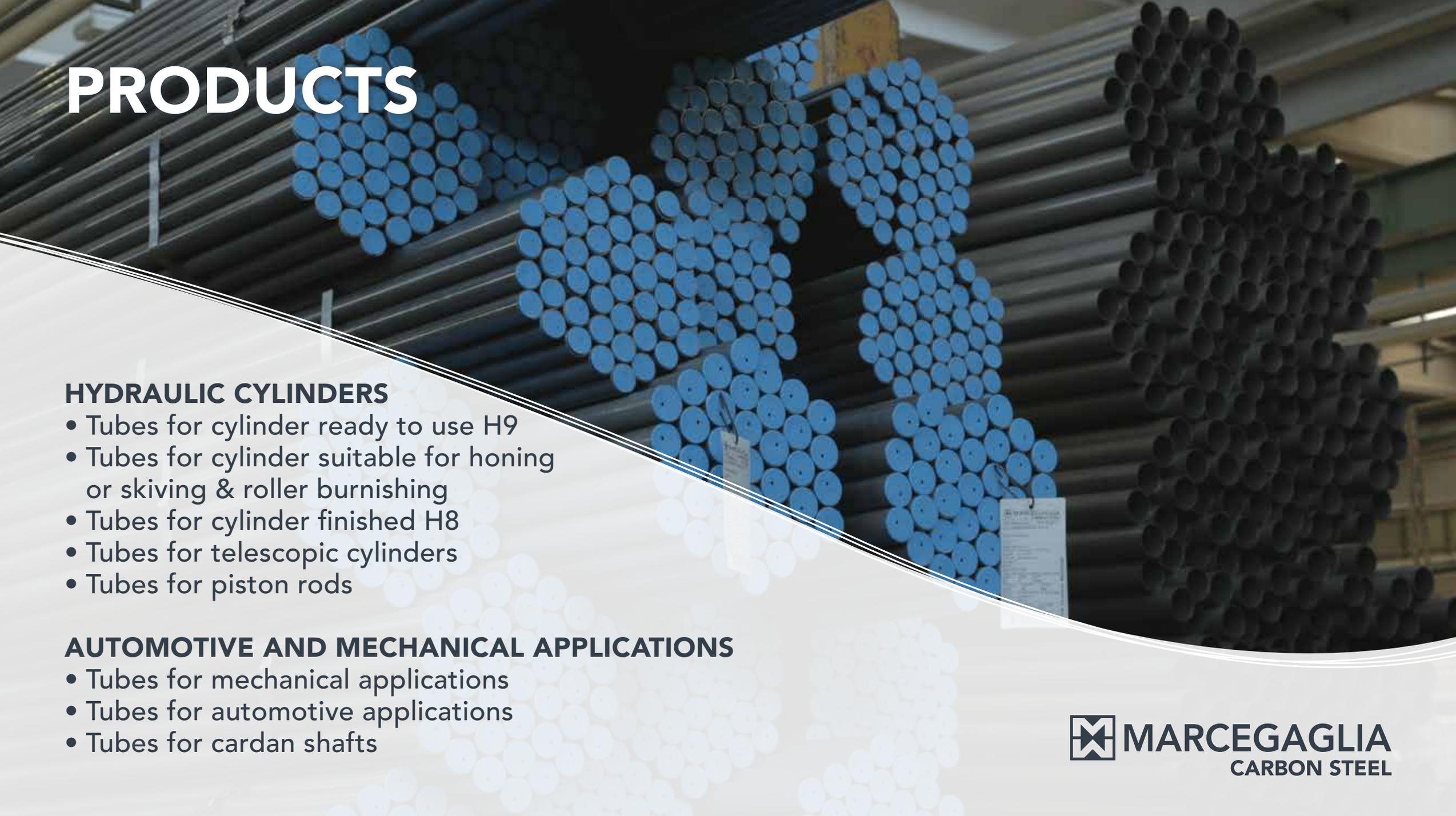


70%
Hydraulic

30%
Automotive

 **MARCEGAGLIA**
CARBON STEEL

PRODUCTS



HYDRAULIC CYLINDERS

- Tubes for cylinder ready to use H9
- Tubes for cylinder suitable for honing or skiving & roller burnishing
- Tubes for cylinder finished H8
- Tubes for telescopic cylinders
- Tubes for piston rods

AUTOMOTIVE AND MECHANICAL APPLICATIONS

- Tubes for mechanical applications
- Tubes for automotive applications
- Tubes for cardan shafts

HYDRAULIC CYLINDERS

READY-TO-USE CYLINDERS TUBES H9

USED MAINLY
FOR AGRICULTURAL APPLICATIONS

Low pressure cylinders: <200 bar

TECHNICAL CHARACTERISTICS

GRADE E355

TREATMENT +C Hard

SURFACE FINISHING

- **Outside diameter:** smooth as drawn (EN 10305-2)
- **Inside diameter:** roughness Ra < 0.80 μ (average 0.50÷0.60 μ)

DIMENSIONAL TOLERANCES

- **Outside diameter:** 50% EN 10305-2
- **Inside diameter:** ISO H9 (ISO H10 for thickness < 4 mm)
- **Eccentricity:** < 3%
- **Straightness:** 1:1000 mm

Outside diameter (mm): min 30 - max 145

Thickness (mm): min 2.5 - max 7.5



HYDRAULIC CYLINDERS

TUBES FOR CYLINDER SUITABLE FOR HONING OR SKIVING & ROLLER BURNISHING

TECHNICAL CHARACTERISTICS

GRADE	E355
TREATMENT	+SR Stress Relieved
SURFACE FINISHING	<ul style="list-style-type: none">• Outside diameter: smooth as drawn (EN 10305-2)• Inside diameter: with stock allowance (skiving/roller burnishing)
DIMENSIONAL TOLERANCES	<ul style="list-style-type: none">• Outside diameter: 50% EN 10305-2• Eccentricity: < 3%• Straightness: 1:1000 mm



Outside diameter (mm): min 30 - max 245

Thickness (mm): min 5 - max 15

HYDRAULIC CYLINDERS

MAINLY USED
FOR EARTH-MOVING MACHINES AND LIFTS

TUBES FOR CYLINDER SUITABLE FOR HONING OR SKIVING & ROLLER BURNISHING



Telehandler



Fork Lift



Drill Rig



Skip Loader



Turf Care



Hauler



Truck Mounted Crane



Harvesting Head



Snow Plow



Truck Mounted Log Loader



Forest Machine



Wheel Loader



Backhoe Loader



Roll-Off



Refuse Collecting

- High pressure hydraulic cylinders: >200 bar

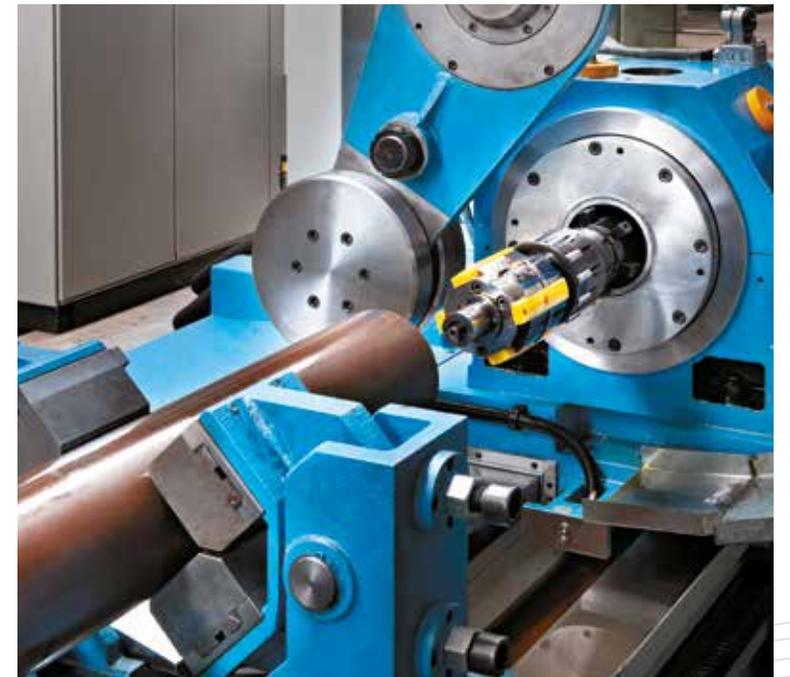
HYDRAULIC CYLINDERS

TUBES FOR CYLINDERS FINISHED H8

TECHNICAL CHARACTERISTICS

GRADE	E355
TREATMENT	+SR (BKS) Stress Relieved
SURFACE FINISHING	<ul style="list-style-type: none">• Outside diameter: smooth ad drawn (EN 10305-2)• Inside diameter: skived and roller-burnished H8 Ra max 0.3 μ
DIMENSIONAL TOLERANCES	<ul style="list-style-type: none">• Inside diameter: ISO H8, min. 40 mm - max. 220 mm

Inside diameter (mm): min 40 - max 220



HYDRAULIC CYLINDERS

TUBES FOR TELESCOPIC CYLINDERS

TECHNICAL CHARACTERISTICS

GRADE E355

TREATMENT +SR Stress Relieved

SURFACE FINISHING

- **Diametro esterno:** smooth as drawn (EN 10305-2)
- **Inside diameter:** roughness Ra < 1.6 μ

DIMENSIONAL TOLERANCES

- **Straightness:** 0.50 mm/m max

Outside diameter (mm): min 40 - max 245

Thickness (mm): min 5 - max 15



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HYDRAULIC CYLINDERS

COLD-DRAWN TUBES SUITABLE FOR CHROME PLATING

TECHNICAL CHARACTERISTICS

GRADE E355

TREATMENT +N Normalized, +SR Stress Relieved

SURFACE FINISHING

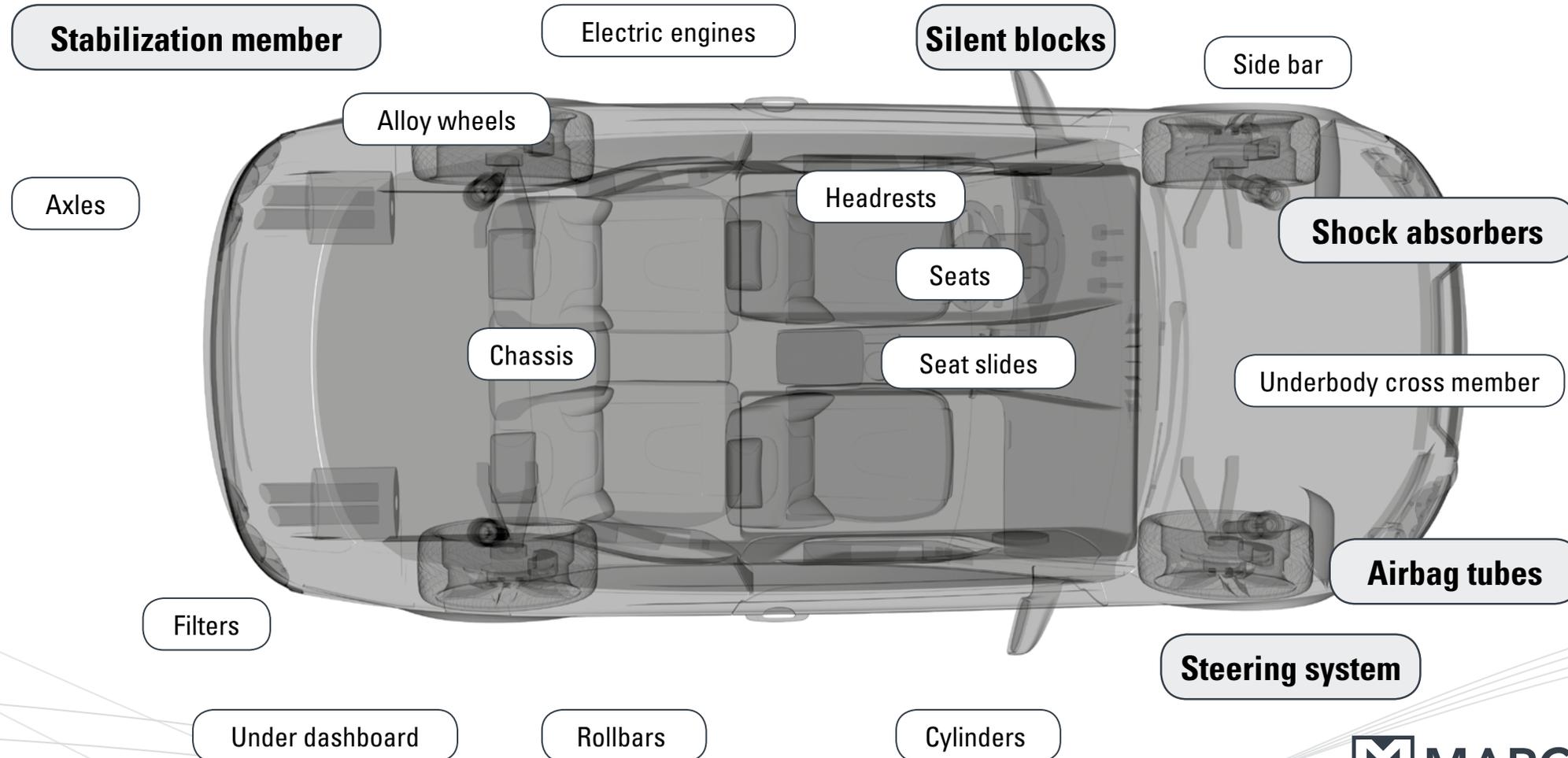
- **Outside diameter:** with stock allowance (for subsequent reworking)
- **Inside diameter:** smooth as drawn (EN 10305-2)

Outside diameter (mm): min 30 - max 200

Thickness (mm): min 5 - max 15



AUTOMOTIVE AND MECHANICAL



AUTOMOTIVE AND MECHANICAL

COLD-DRAWN TUBES FOR AUTOMOTIVE AND MECHANICAL APPLICATIONS

TECHNICAL CHARACTERISTICS

GRADE E155 - E195 - E235 - E275 - E355

+C Hard

+LC Soft

TREATMENT

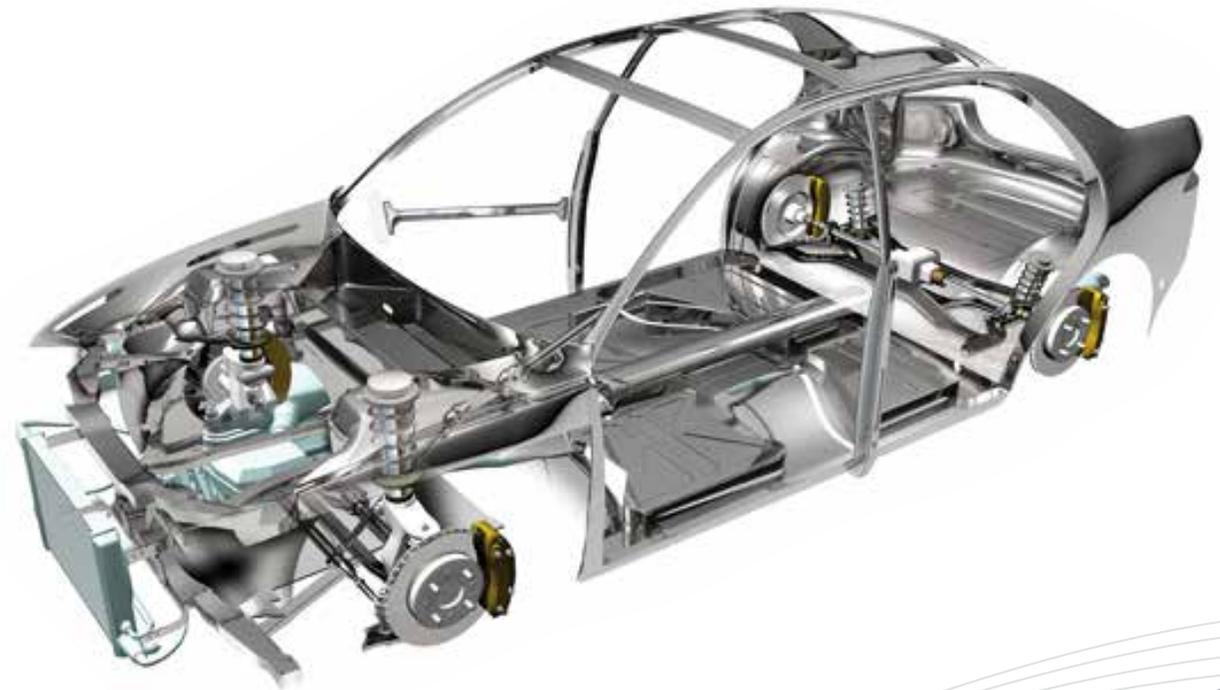
+SR Stress Relieved

+A Annealed

+N Normalized

Outside diameter (mm): min 18 - max 245

Thickness (mm): min 1.5 - max 15



AUTOMOTIVE AND MECHANICAL

COLD-DRAWN TUBES FOR CARDANS SHAFTS (TRILOBULAR, SPACIAL SHAPES, ETC.)

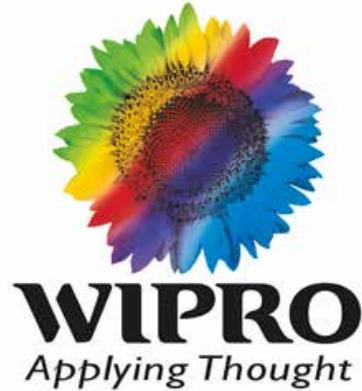
TECHNICAL CHARACTERISTICS

GRADE	E235 - E355
TREATMENT	+C Hard +LC Soft +N Normalized
DIMENSIONAL TOLERANCES	According to customer request
DIMENSIONS AND PROFILES	According to customer request



SOME OF OUR CUSTOMERS

CATERPILLAR[®]



CASE
CONSTRUCTION



FASSI
LEADER IN INNOVATION

OCIMA
OLEODINAMICA

HYVA[®]

 **MARCEGAGLIA**
CARBON STEEL

Ottobre 2019

OUR STEEL BRINGS YOUR WORLD TO LIFE

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