



Gonvarri
Precision Tubes



On the road

Flinsa - Golvauto Asturias



Nowadays, Gonvarri tube branch has 2 facilities with a total production capacity over 150.000 t/year. The manufacturing of low carbon alloy steels, encompass a range from Ø8 up to Ø130 mm, and from Ø25 up to Ø104 mm in stainless steel. We can manufacture for both steel types, either round tube or its different derivatives sections, such as square, rectangular, flat oval and some other special shapes as per customer requirements.

In addition, in order to give a complete solution when requested by our customers, we can also cut to length the tube by either saw blade or laser cutting and drilling technologies, moreover than quenching process and some other forming operations.

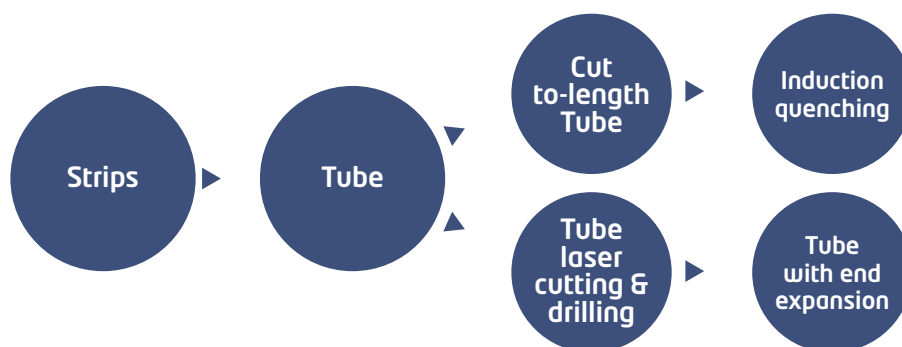
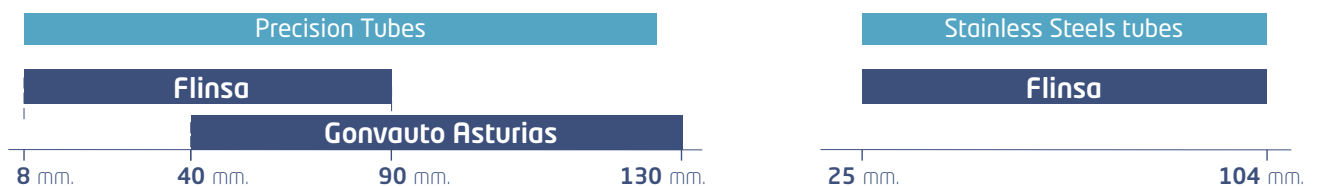

+80
(mm€)
Turnover

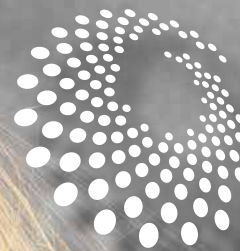

+200
Employees


25
Global presence
in Countries


2
Plants


+150.000
Capacity in Tons





Gonvarri

Precision Tubes

Flinsa was officially founded in the year **1975** as carbon steel cold rolling works.



Flinsa
Gonvarri Industries



Gonvauto
Asturias

As cornerstone of the process, from its beginning, the company has a 4-high reversing cold rolling mill, 320 mm width, several slitting lines and bell furnaces. In **1988**, Flinsa undertook the task of enlarging its products range with the manufacturing of high-frequency welded steel tube. Among the reasons of this decision is the fact that strip is the raw material for tube making, and we had a huge technical experience on strips, regarding to both the steel industry supplied qualities and those that we could manufacture in our rolling mill process.

In **2007** starts the works at the new plant, which doubled the company size.

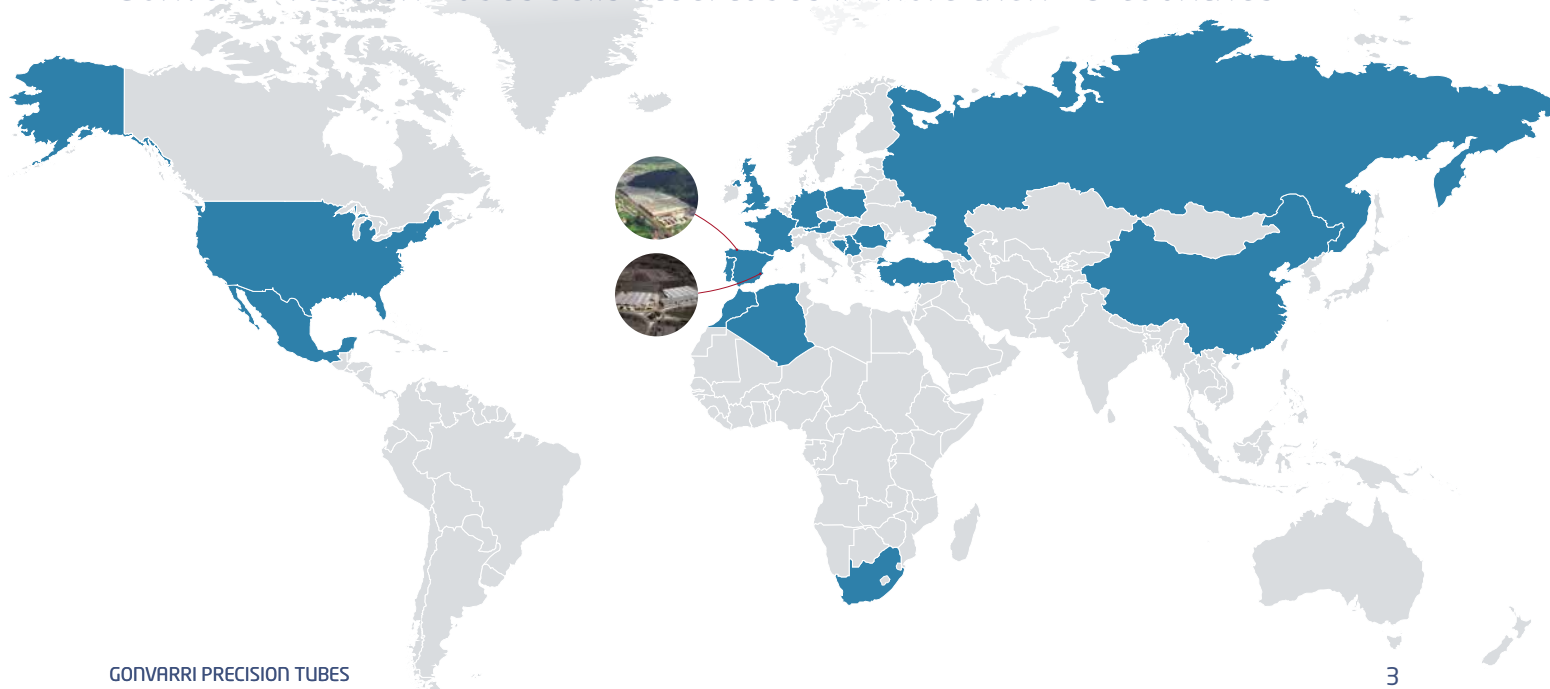
In **2011** we started manufacturing our new range of stainless steel products, strip and tubes, under the registered trademark Flinox®, as well as laser cutting and drilling.

In **2013** Gonvauto Asturias was established as a business unit focused on automotive industry. As customers demands grown, in order to enhance the quality and service of the former tube mills, Gonvarri Industries invested on state of art installations to fulfill customer expectations and expand operations.

In **2018**, Flinsa becomes part of the Gonvarri group and together with Gonvauto Asturias is established the new division Gonvarri Precision Tubes.

2020: Creation of Precision Tubes division.

Gonvarri Precision Tubes sells steel tubes in more than 25 countries



Headrest tubes

Product Range			
Range diameter	Tolerance	Thickness range	Tolerance
12 - 16 mm.	± 0,06 mm.	1,00 to 1,25 mm.	±0,05 mm.
		1,26 to 1,50 mm.	±0,06 mm.
		1,50 to 2,00 mm.	±0,08 mm.
		2,00 or above	±0,10 mm.

ID (inner ø) tolerance	Total range of requested tolerance, will be 0,10 mm plus twice the wall thickness tolerance and in direct relation to OD and its tolerance
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Mechanical Properties . Tensile test acc. ISO 6892-1

Standard	Grade	Rp(0,2) MPa	Rm MPa	A(5)%	Standard	Grade	Rp(0,2) MPa	Rm MPa	A(5)%
EN 10305-3	E235+CR1	≥ 235	≥ 390	≥ 7	EN 10305-3 EN 10338 (VDA 239-100)	HCT590X (CR330Y590T-DP)	≥ 650	≥ 700	≥ 12
	E275+CR1	≥ 275	≥ 440	≥ 6		E600HRF	≥ 690	≥ 780	≥ 12
	E320+CR2	≥ 690	≥ 780	≥ 19		E600HRF-ED®	≥ 610	≥ 700	≥ 14
	E370+CR2	≥ 370	≥ 450	≥ 15		HCT780X (CR440Y780T-DP)	≥ 650	≥ 800	≥ 7
	E420+CR2	≥ 420	≥ 490	≥ 12	TOYOTA BSDG3156	STKM-470	≥ 275	≥ 470	≥ 10
	E500+CR2	≥ 500	≥ 540	≥ 10		STKM-650	≥ 500	≥ 650	≥ 10
	E550+CR2	≥ 550	≥ 590	≥ 10		STKM-750	≥ 600	≥ 750	≥ 10
	E600+CR2	≥ 600	≥ 640	≥ 6		STKM-850	≥ 650	≥ 800	≥ 10
Delivery condition: +CR2					Delivery condition: +CR2				

Chemical composition	According standards.
Surface condition	The surface free from marks and scratches. Cut to length tube deburred and washed. Roughness Ra ≤ 0,6µm (Rz ≤ 4µm)
Straightness	The tube with higher straightness level; maximum bending of 1 mm/m.
Remarks:	Further requirements to the above detailed, should be approved with a feasibility study.

Own developments

In its permanent target of providing important technological improvements, the whole company is focused on R&D to develop new solutions and products.

Our product "Extraductile" is a solution emerging from our perception regarding the DP materials focused on headrest structures that these steel grades produce certain difficulties during its processing due to their limited plasticity.



Normal E600 HRF

Our **normal tube** allows bending with a medium radius with the best surface finishing and wall thickness.

This is the result of years of experience added to a lot of research and thanks to the close and constructive collaboration we have with the steel makers.

This product always exceeds the requirements of the current standards (see data sheet on next page).



Extraductile E600HRF-ED

Our **Extraductile tube** brings the possibility to make double bending with curves very close one to the other and more exigent radius of curvature. The deformation and thickness reduction in stretching points are lower. It maintains the best surface finishing, also brings longer live for the tooling and it offers more deformability.

Finitube®

Flinsa makes Finitube with many technical cares from the beginning up to the end of the process using our know-how we have learned in more than 20 years making this type of tubes.

Finitube range gives the best surface finish for those products that due to its functionality and final use go to high quality aesthetic components, like chromed, nickled, metal paintings, etc.

This Product complies with high demanding surface requirements, like the lack of process marks and the maximum control of the final surface roughness in the tube.

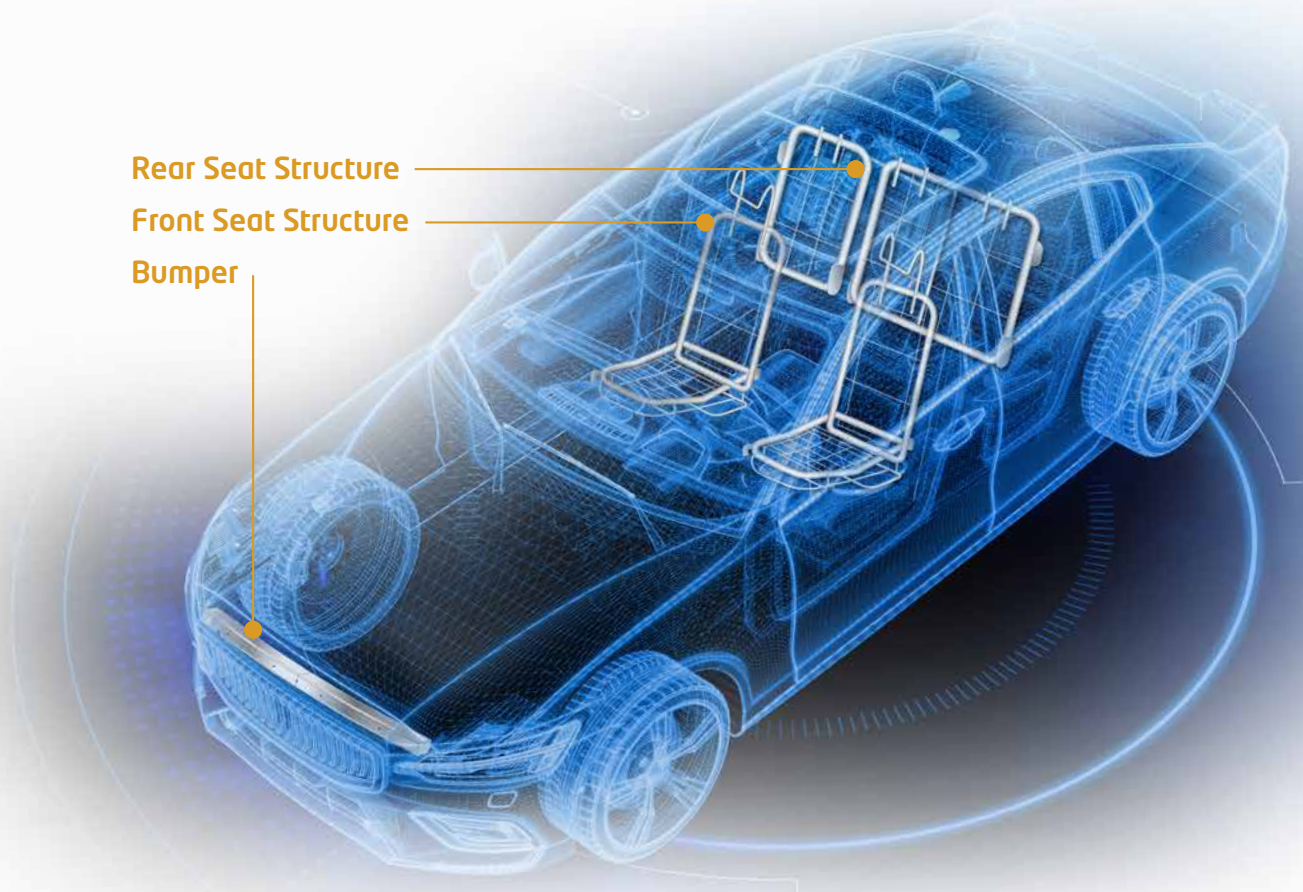


Third generation AHSS

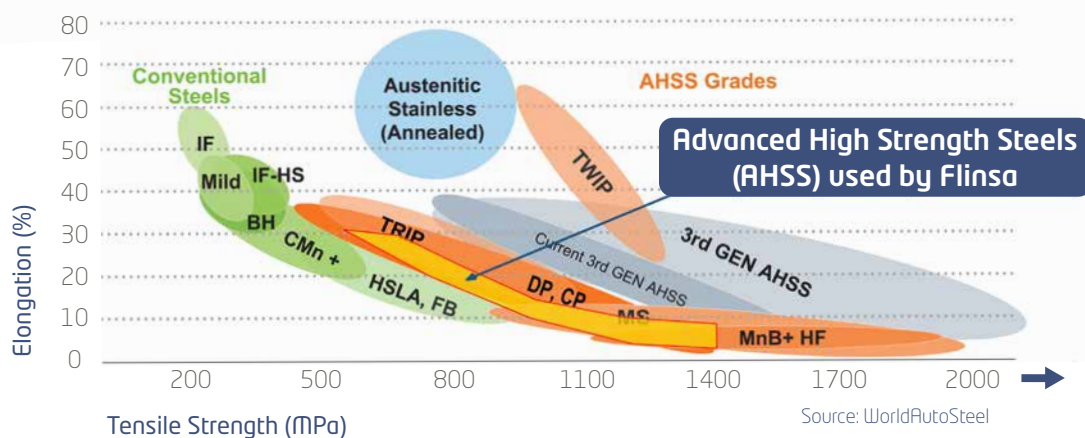
Product Range			
Quality	Tube tipe	Dimensions range	Thickness range
HCT590X CR330Y590T-DP	round	Ø10-Ø70 mm	≤ 3 mm
	square	16x16 - 50x50	≤ 2,5 mm
	rectangular	16x10 - 80x30	
	oval	25x10 - 60x20	
HCT780X (CR440Y780T-DP) HDT760C (HR660Y760T-CP)	round	Ø15-Ø70 mm	≤ 3 mm
	square	20x20 - 50x50	≤ 2,5 mm
	rectangular	25x15 - 80x30	
	oval	30x15 - 60x20	
HCT980X CR590Y980T-DP	round	Ø15-Ø70 mm	≤ 2 mm.
	square	25x25 - 50x50	
	rectangular	20x15 - 80x30	
	oval	30x20 - 50x25	
DP1200M (CR950Y1200T-MS) DP1300M(CR1030Y1300T-MS) DP1400M (CR1150Y1400T-MS)	round	Ø20-Ø70 mm	
	square	25x25 - 50x50	
	rectangular	30x20 - 80x30	
	oval	35x25 - 50x25	
Chemical composition	According standards. EN10338 and VDA239-100		
Dimensional and thickness tolerance	According standars EN 10305-3/5.		
Straightness	The tube with higher straightness level: · Normal straightness: 1,5 mm/m. · Restricted straightness: 1 mm/m.		
Flatness	Flatness in tubes: · Normal flatness: <0,5 mm/m. · Restricted flatness: <0,3 mm/m.		
Twisting	Twisting level of tubes: · Normal twisting: 1,5 mm/m. · Restricted twisting: 1 mm/m.		
Remarks	Further requirements to the above detailed, should be approved with a feasibility study.		

The Advanced High Strength Steels (AHSS) are the latest generation of steels that offer an effective solution to the optimization of weights. These are also noted for the great response in parts with the highest solicitation requirements and energy shock absorption, especially in the automotive market. Its cost is offset by the possibility of mass reduction, making them a technological competitive solution.

Among the most remarkable degrees we have: Dual Phase steels (DP), Complex Phase steels (CP), Martensitic steels (MS), TRIP effect steels, PM, MP, QP, TWIP, B and LDS. Multiphase steels are used to make tubes that Flinsa markets which are used to make parts structurally involved in many vehicles worldwide.



Position of flat steel products in the stress/deformation diagram



Quenched tubes

Induction quenching is based on the material heating while passing through a high strength variable magnetic field. Heating penetration depends on working frequency. An accurate control on it ensures a perfect quenching homo-

geneity in the entire section. The use of Mn-B alloy steel grades, guarantees a high level of impact energy absorption, essential value property in some pieces like side impact beams.

Range	Product Range			
	Ø (OD)	wall thickness	length	Tolerance
	18 - 40 mm	1,40 - 3,50 mm	250 - 1.250 mm Tolerances: ± 1 mm (standard) ($\pm 0,50$ mm narrow) ($\pm 0,30$ mm precision)	1 According to standard required (EN 10305-3, NES M2022) or customer specification. 2 For raw material apply EN 10083-3, PSA B533830, Renault RNT 11-04-822, Nissan M2201

Straightness	Maximum bending of 1,50 mm/m.
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Mechanical Properties on tube. Tensile test acc. ISO 6892-1					
Standard	Grade	Rp(0,2) MPa	Rm MPa	A(5)%	min. HRC(*)
EN 10305-3	Tube 22MnB5	≥ 1100	≥ 1450	≥ 5	46
NES M2022	STAM 1470	≥ 1080	≥ 1470	≥ 5	46
RNT 11-04-822	22MnB5F-RNT	1000-1250	1300-1650	$\geq 4,5$	43
PSA B533830	22MnB5-PSA	≥ 950	≥ 1300	≥ 6	43
EN 10305-3	Tube 26MnB5	≥ 1200	≥ 1550	≥ 4	47
EN 10305-3	Tube 30MnB5	≥ 1300	≥ 1650	≥ 4	48

*Based on EN 10083-3. Typical values from steel mill.



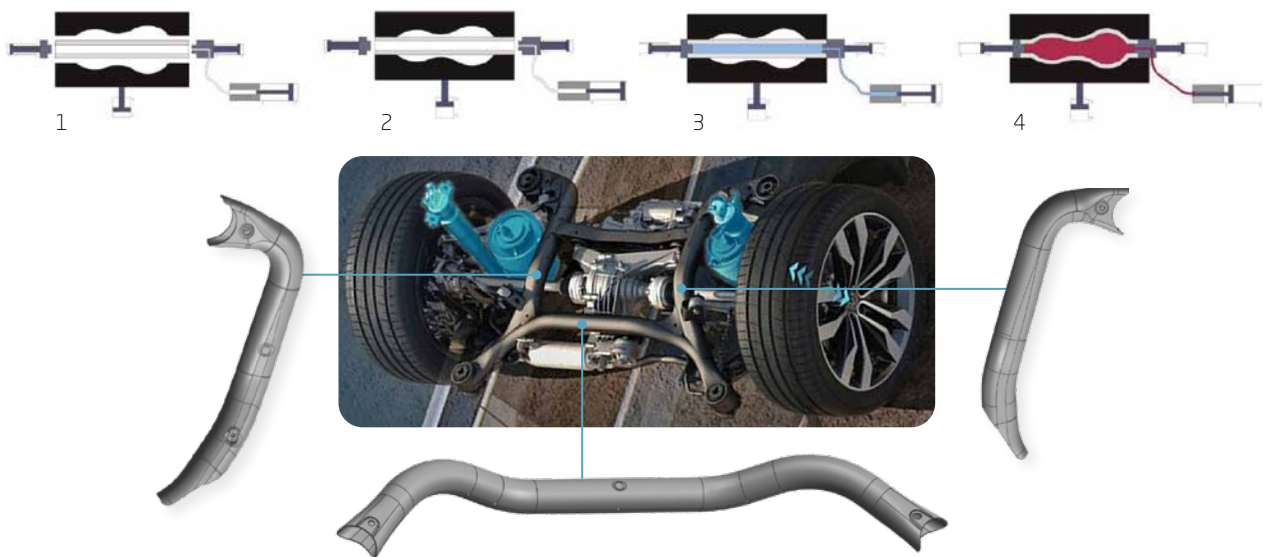
Surface condition	The surface free from marks and scratches. Slightly oiled.	
Testing methods	Before quenching process: Eddy current ISO 10893-2 (NDT) only for weld seam Flattening test acc. ISO 8492 Drift-expanding test acc. ISO 8493	After quenching process: Hardness test (HRC)
Remarks:	Further requirements to the above detailed, should be approved with a feasibility study.	

Tubes for hydroforming

We are proud suppliers of finest precision tubes, and we are specialists on tubes for hydro forming purposes, one of most demanding tubes of the market. Hydro forming is a very aggressive process to obtain complexes shapes from round tubes:

- 1 Tube placed inside the press. Normally parts are bent before the create a pre-shape that will fit the die.
- 2 Die closes around the tube
- 3 System fills up the tube with water
- 4 High pressure pumps rise the pressure up to 2000 bar in order to define final shape.

This aggressive procedure requires high quality butt weld seams, with no pores or micro cracks. Therefore, the tubes are produced with best welding conditions possible, where each reference has been tested to determine optimal both rolling and welding parameters. We are able to produces DP galvanized steel, with a very low ratio of welding failure.



Hydroforming tube manufacturing capabilities span a wide range of grades, from commodity steels to last generation steels.

Product Range			
Steel grades / Standard	Tube type	Dimensions range	Thickness range
Hot rolled steels (EN 10111 - EN 10025) HSS Steels (EN 10149 - EN 10268) AHSS Steels (EN 10338)	round	Ø40-Ø130 mm	≤ 4 mm
	square	Under feasibility study	
	rectangular		

Stainless steel

We offer a wide range of tubular products manufactured in austenitic ferritic and duplex steels, welded by LASER technology, includes round tubes (EN 10269-2) diameter from 25 a 104 mm and their square and rectangular derivative shapes (EN 10305-5).

The markets in which our stainless products are intended for cover automotive, construction (structural elements and decoration), metal and street furniture, food, pharmaceutical, etc. Within the automotive sector, we are focused on tubes for exhaust systems.

Exhaust system with our tubes

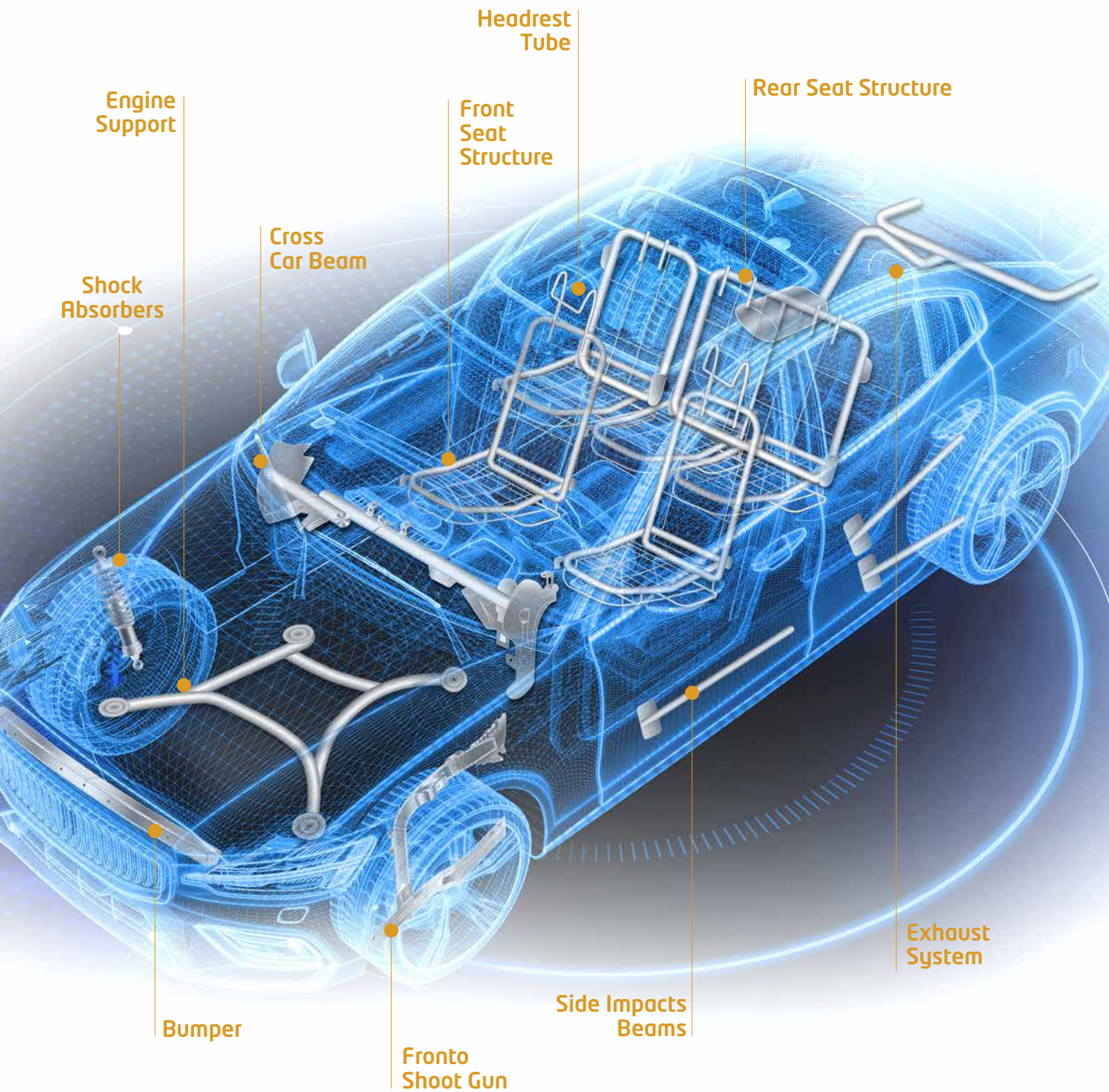
Product Range				
	Dimensions	Wall thickness	length	tolerances and others dimensios
Round	ø25-104	from 0,5 to 4 mm.	In random length up to 7.000 mm or laser cutted	EN 10296-2 / ISO 1127
Square and rectangular	see our catalogue	from 0,8 to 4 mm		EN 10305-5 / EN 10219-2 ISO 1127

Stainless steel grade		
Type	Grade (EN - AISI)	Mechanical and chemical
Ferritic	1.4016 (430) / 1.4509 (441) / 1.4510 (439) / 1.4511 (430Ti) / 1.4512 (409)	EN 10296-2 EN 10088-2
Austenitic	1.4301 (304) / 1.4307 (304L) / 1.4401 (316) / 1.4432 (316L) / 1.4541 (321)	
Duplex	1.4362 (2304) / 1.4462 (2205) / 1.4410 (2507)	



On the road

GPT tube's main applications





Gonvarri
Precision Tubes



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