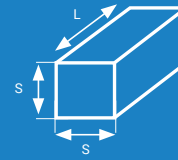
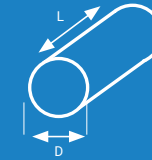
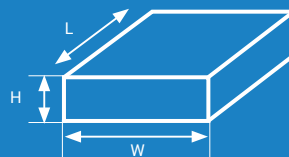


FORGED PRODUCTS



Forged Rounds			
		Min	Max
Diameter (D)	mm	200	800
Length (L)	mm	2.000	12.000
Forged Weight	kg	2.000	27.000

Forged Squares			
		Min	Max
Length (L)	mm	-	8.000
Square Size (S)	mm	200	8.000
Forged Weight	kg	2.000	27.000



Forged Blocks			
		Min	Max
Length (L)	mm	2.000	7.000
Width (W)	mm	400	800
Height (H)	mm	200	600
Forged Weight	kg	2.000	27.000

Discs			
		Min	Max
Diameter (D)	mm	500	1.600
Height (H)	mm	200	500
Forged Weight	kg	2.000	27.000



Roll Blanks			
		Min	Max
Diameter (D)	mm	300	1.000
Length (L)	mm	2.000	6.000
Forged Weight	kg	2.000	20.000

* Forging tolerances are according to DIN 7527 standard.

* Given product dimensions and shapes are nominal, exact dimensions are determined at the order stage.

INGOT DATA

Ingot Mould Section	Total Weight Head+Body (kg)
480 Square	2.250
550 Square	2.850
595 Square	3.650
630 Square	4.200
795 Square	7.700
1060 Square	12.350
720 Polygonal	4.600
945 Polygonal	9.300
980 Polygonal	12.900
P 18 Polygonal	16.200
P 25 Polygonal	22.700
P 35 Polygonal	31.700

ESR INGOTS

410 Round	2.200
550 Round	3.900
660 Round	6.100
800 Round	8.500
1000 Round	16.000



HOT WORK TOOL STEELS

Standards		Typical Analysis (wt.%)									Specific Properties	Typical Applications
DIN	EN	AISI/SAE	JIS	C	Si	Mn	Cr	Mo	Ni	V		
1.2343	X37 CrMoV 5-1	H11	SKD6	0.37	1.00	0.38	5.15	1.30	-	0.40	Hot-work tool steel containing Cr, Mo and V. Excellent toughness combined with high thermal stability. Good wear resistance. Very good impact toughness. Very high machinability.	High Pressure Die Casting Tools, Forging (Hot/Semi-Hot) Dies, Hot Extrusion Tools, Cylinders and Screws for Plastic Processing, Hot Shear Knives, Hydro Forming Tools, Turbochargers, Piston Rings, Sensors.
1.2343 ESR												
1.2344	X40 CrMoV 5-1	H13	SKD61	0.40	1.00	0.35	5.15	1.35	-	1.00	Suitable for quenching and tempering. High temperature strength and wear resistance. Good toughness. Resistant to thermal shock and hot cracking. Good hardenability.	Hot Forging Dies, Hot Forming Dies, Plastic Molds, Hot Extrusion Tools, Hot Shear Knives
1.2344 ESR												
1.2367	X38 CrMoV 5-3	-	-	0.38	0.40	0.40	5.00	2.95	-	0.50	Cr-Mo-V steel for hardening in oil and in air with very good hardenability. Developed instead of 1.2365 to provide high hardness and wear resistance. Very good toughness and physical properties at low and elevated temperatures. Very good resistance to tearing of thermal fatigue and low sensitivity to quick changes of temperature.	Large Die Casting Tools, Tools Needing High Strength at Elevated Temperatures, Hot Forging Dies, Mandrels, Extrusion Dies
1.2367 ESR												
1.2367 Mod	-	-	-	0.35	0.20	0.45	5.10	2.35	-	0.55	Cr-Mo-V alloyed hot work tool steel with very good hot wear and plastic deformation resistance. Good dimensional stability throughout heat treatment and coating operations. Excellent toughness, ductility and hardenability. Higher high-temperature strength and toughness than 1.2367.	
1.2367 Mod ESR												
1.2714	55 NiCrMoV 7	6 F 3	SKT4	0.55	0.25	0.75	1.00	0.45	1.65	0.10	Nickel hot work tool steel with good hardenability. Delivered both annealed or hardened (37-42 HRC) conditions. Uniform hardness over section also at large dimensions. Very good strength and toughness. Tools can be water or air cooled.	Dies for Drop Forging Hammers and Mechanical Presses, Die Molds, Shoe Blocks, Die Holder, Cassettes, Piston Rods, Cranks, Boosters, Shearing Blades, Tools, Plastic Molds, Shafts.
1.2714 ESR												
1.2714 Mod	-	-	-	0.52	0.25	0.85	1.05	0.65	2.05	0.11	Cr-Ni-Mo alloy hot work tool steel with good hardenability. Very good strength and toughness. Tools can be water or air cooled. Improved high temperature resistance properties and increased wear resistance compared to grade 1.2714.	

PLASTIC MOLD STEELS

Standards		Typical Analysis (wt.%)									Specific Properties	Typical Applications
DIN	EN	AISI/SAE	JIS	C	Si	Mn	Cr	Mo	Ni	V		
1.2083	X40Cr14	-	-	0.39	<1.00	<1.00	13.50	-	-	-	Good corrosion resistant tool steel with high dissolved Cr-content in the steel matrix. Very high machinability and dimensional stability. Good toughness. Suitable for quenching and tempering. Good polishability.	Plastic Injection Molds, Extrusion Dies, Medical and Optical Industry Parts such as Spectacles and Lenses.
1.2083 ESR												

* The Electroslag Remelting (ESR) process results in high performance hot work tool steels with enhanced quality due to highly homogeneous and clean microstructure.

Disclaimer

This specification is for information only, Asil Celik takes no responsibility for the suitability of the steels referred to in this specification to a given product or end use. We reserve the right to change the data in this specification without prior notification, Asil Celik takes no responsibility for any errors in the information, or for any consequences resulting from its use.

HOT ROLLED PRODUCTS

	Ebat (mm)
Round Bars	19 - 300
Round Cornered Square Bars	50 - 245
Hexagonal Bars	18 - 80
Large Flat Bars	80 - 200 x 200 - 400
Flat Bars	8 - 60 x 60 - 130

WEIGHT PER METER FORMULAS

$$\text{weight per meter} = \frac{d^2 \times 0.616}{100} \text{ kg}$$

$$\text{weight per meter} = \frac{a^2 \times 0.785}{100} \text{ kg}$$

$$\text{weight per meter} = \frac{a \times b \times 0.785}{100} \text{ kg}$$

$$\text{weight per meter} = \frac{a^2 \times 0.68}{100} \text{ kg}$$

$$\text{weight per meter} = 0.0076495 a^2 - 0.0059579 r^2 \text{ kg}$$

STEEL GRADES PRODUCED

CARBON STEELS	
080A42	S 35 C
C 45	SAE 1040
C 60 R	SAE 1050
CF 53	

STAINLESS STEELS	
AISI 410	X 17 CrNi 16-2
AISI 431	X 20 Cr 13
420S29	X 46 Cr 13

FREE CUTTING STEELS	
11 SMn 30 (9 SMn 28)	
11 SMn 37 (9 SMn 36)	
11 SMnPb 30 (9 SMnPb 28)	
11 SMnPb 37 (9 SMnPb 36)	
35 S 20	

HEAT TREATABLE STEELS	
34 CrNiMo 6	AISI 4145
39 NiCrMo 3 Pb	605M36
41 Cr 4	817M40
42 CrMo 4	SAE 4150
AISI 4130	SCM 440H
AISI 4140	31 CrMoV 9

HIGH TEMPERATURE RESISTANT STEELS	
10 CrMo 9-10	16 Mo 3
13 CrMo 4-5	X 20 CrMoV 12-1
32 CrMoV12-10	

AISI C12L14
220M07
EN 8M
SAE 1117

BEARING STEELS	
100 Cr 6	100 CrMo 7-3
100 CrMnSi 6-4	AISI 52100
100 CrMn 6	SUJ 3
100 CrMo 7	

MICROALLOYED STEELS	
(High Strength Low Alloy (HSLA) Steels)	
19 MnVS 6	38 MnVS6
30 MnVS 6	ZF 59
38 MnSiVS 5	AMC @ 1200 (Bainitic Steel)

SPRING STEELS	
55 Cr 3	52 CrMoV4
51 CrV4	31 CrV3
60 SiCr 8	SUP 9
60 SiMn 5	SUP9A
AISI 9260	

BORON STEELS	
20 MnB 4	ZF 6
33 MnCrB 5-2	ZF 7
SAE 51B60	ZF 7B

COLD AND HOT WORKING TOOL STEELS	
1.2343 (X 37 CrMoV 5-1)	1.2714 (55 NiCrMoV 7)
1.2344 (X 40 CrMoV 5-1)	1.2842 (90 MnCrV 8)
1.2367 (X 38 CrMoV 5-3)	1.2083 (X40 Cr14)

WEAR RESISTANT STEELS	
X 90 Mn 18	
15 NiMoCrB 4-5	
X 120 Mn 12	
GS-60 CrSi 5	

CONSTRUCTIONAL STEELS	
150M19	St 44-2
St 37-2	St 60-2
S355J2 (S355J2G3, St 52-3)	

CASE HARDENING STEELS	
16/20 MnCr(S) 5	SAE 8620H
18 CrNiMo 7-6	SCM 420
18 NiCrMo 5	ZF1
25 MoCr4	ZF1A
AISI 5120	19 CN 5
655M13	



HOT ROLLED PRODUCTS

ROUNDS									
19 mm - 300 mm									
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
19	0,75	45	1,77	71	2,80	97	3,82	166,7	6,56
20	0,79	46	1,81	72	2,83	98	3,86	170	6,69
21	0,83	47	1,85	73	2,87	99	3,90	173,45	6,83
22	0,87	48	1,89	74	2,91	100	3,94	180	7,09
23	0,91	49	1,93	75	2,95	101,5	4,00	186,15	7,33
24	0,94	50	1,97	76	2,99	102,4	4,03	190	7,48
25	0,98	51	2,01	77	3,03	105	4,13	192,5	7,58
26	1,02	52	2,05	78	3,07	108,75	4,28	198,86	7,83
27	1,06	53	2,09	79	3,11	110	4,33	200	7,87
28	1,10	54	2,13	80	3,15	111,5	4,39	205,2	8,08
29	1,14	55	2,17	81	3,19	115	4,53	210	8,27
30	1,18	56	2,20	82	3,23	115,1	4,53	211,55	8,33
31	1,22	57	2,24	83	3,27	120	4,72	217,9	8,58
32	1,26	58	2,28	84	3,31	121,65	4,79	220	8,66
33	1,30	59	2,32	85	3,35	125	4,92	230	9,06
34	1,34	60	2,36	86	3,39	128	5,04	240	9,45
35	1,38	61	2,40	87	3,43	130	5,12	250	9,84
36	1,42	62	2,44	88	3,46	134,35	5,29	260	10,23
37	1,46	63	2,48	89	3,50	135	5,31	270	10,62
38	1,50	64	2,52	90	3,54	140	5,51	280	11,02
39	1,54	65	2,56	91	3,58	140,7	5,54	290	11,40
40	1,57	66	2,60	92	3,62	145	5,71	300	11,80
41	1,61	67	2,64	93	3,66	147,65	5,81		
42	1,65	68	2,68	94	3,70	150	5,91		
43	1,69	69	2,72	95	3,74	154	6,06		
44	1,73	70	2,76	96	3,78	160	6,30		

According to DIN EN 10060

ROUND SIZE TOLERANCES			
Size (mm)	Tolerance max. ±mm	Ovality max. (mm)	Straightness mm/m
19-30	0,25	0,4	1,0
30-36	0,3	0,4	
36-50	0,4	0,5	
50-75	0,5	0,6	
76-80	0,8	1,28	2,5
83-100	1	1,6	
105-120	1,3	2,08	
125-160	1,6	2,56	
161-180	2	3,0	4,0
181-200	2,2	3,3	
201-220	2,5	3,8	
221-250	3,0	4,5	
250-300	4,0	4,5	

ROUND CORNER SQUARE							
50 mm - 245 mm							
Size mm	Radius mm	Size inch	Radius inch	Size mm	Radius mm	Size inch	Radius inch
50	10	1,97	0,39	145	10	5,71	0,39
55	10	2,17	0,39	145	26	5,71	1,02
60	10	2,36	0,39	150	10	5,91	0,39
65	10	2,56	0,39	150	26	5,91	1,02
70	13	2,76	0,51	155	10	6,10	0,39
75	14	2,95	0,55	155	26	6,10	1,02
80	14	3,15	0,55	155	33	6,10	1,30
85	15	3,35	0,59	160	33	6,30	1,30
90	17	3,54	0,67	170	33	6,69	1,30
95	17	3,74	0,67	175	33	6,89	1,30
100	18	3,94	0,71	180	33	7,09	1,30
105	18	4,13	0,71	185	33	7,28	1,30
110	20	4,33	0,79	190	33	7,48	1,30
115	20	4,53	0,79	190	24	7,48	0,95
120	22	4,72	0,87	200	24	7,87	0,95
125	22	4,92	0,87	200	10-45	7,87	0,39-1,77
130	22	5,12	0,87	225	10-45	8,86	0,39-1,77
135	22	5,32	0,87	245	10-45	9,65	0,39-1,77
140	22	5,51	0,87				

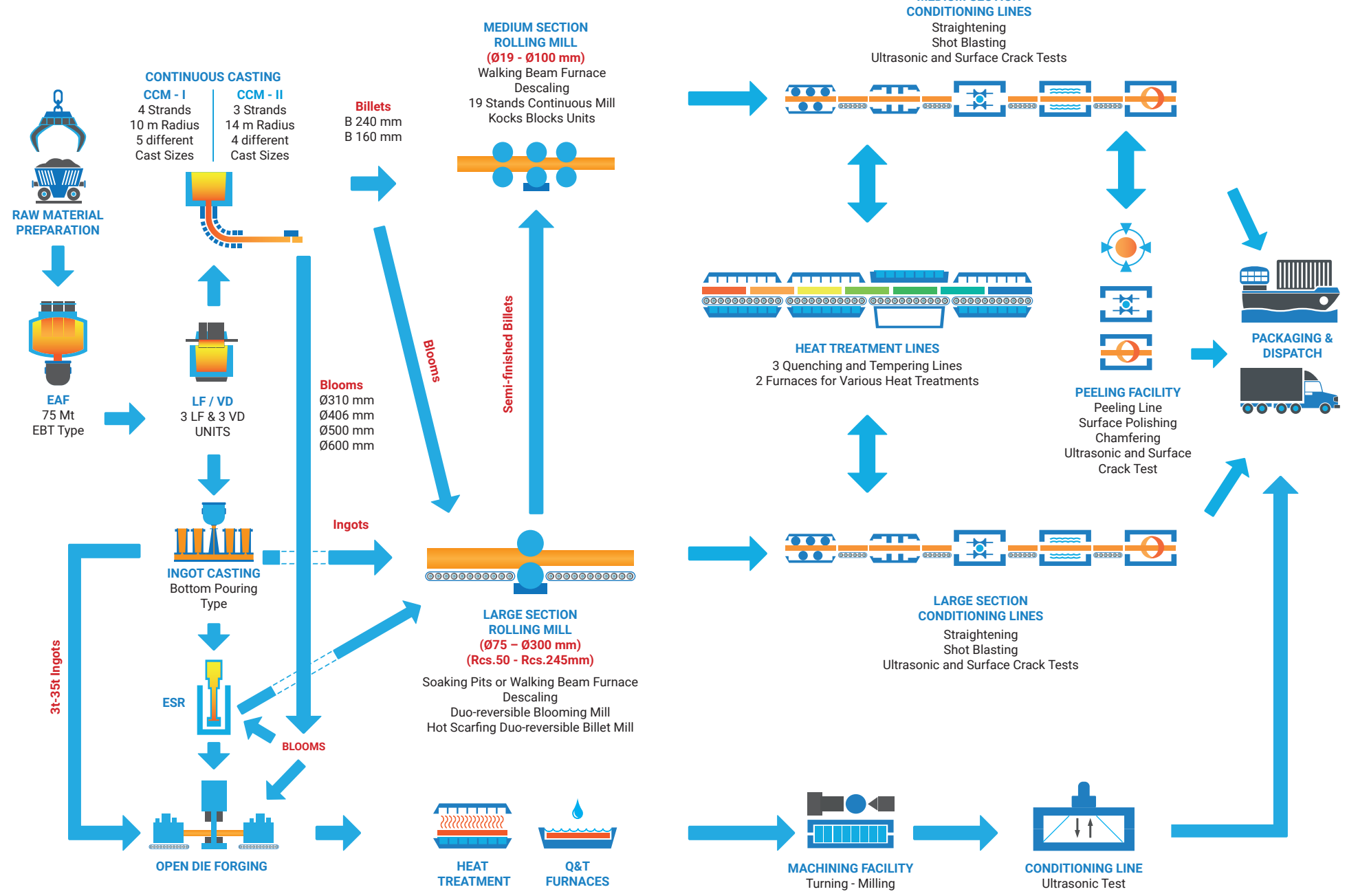
According to DIN EN 10059

SQUARE SIZE TOLERANCES		
Size (mm)	Tolerance max. ±mm	Straightness mm/m
50	0,8	4,0
51-80	1	4,0
81-100	1,3	2,5
101-120	1,5	2,5
121-150	1,5	2,5
151-190	2,0	2,5
191-245	2,5	2,5

HEXAGONALS					
18 mm - 80 mm					
mm	inch	mm	inch	mm	inch
18	0,71	33,5	1,32	57	2,24
20,5	0,81	37,5	1,48	62	2,44
23,5	0,93	39,5	1,56	67	2,64
25,5	1,00	42,5	1,67	71	2,80
28,5	1,12	47,5	1,87	80	3,10
31,5	1,24	52	2,05		

According to DIN EN 10061

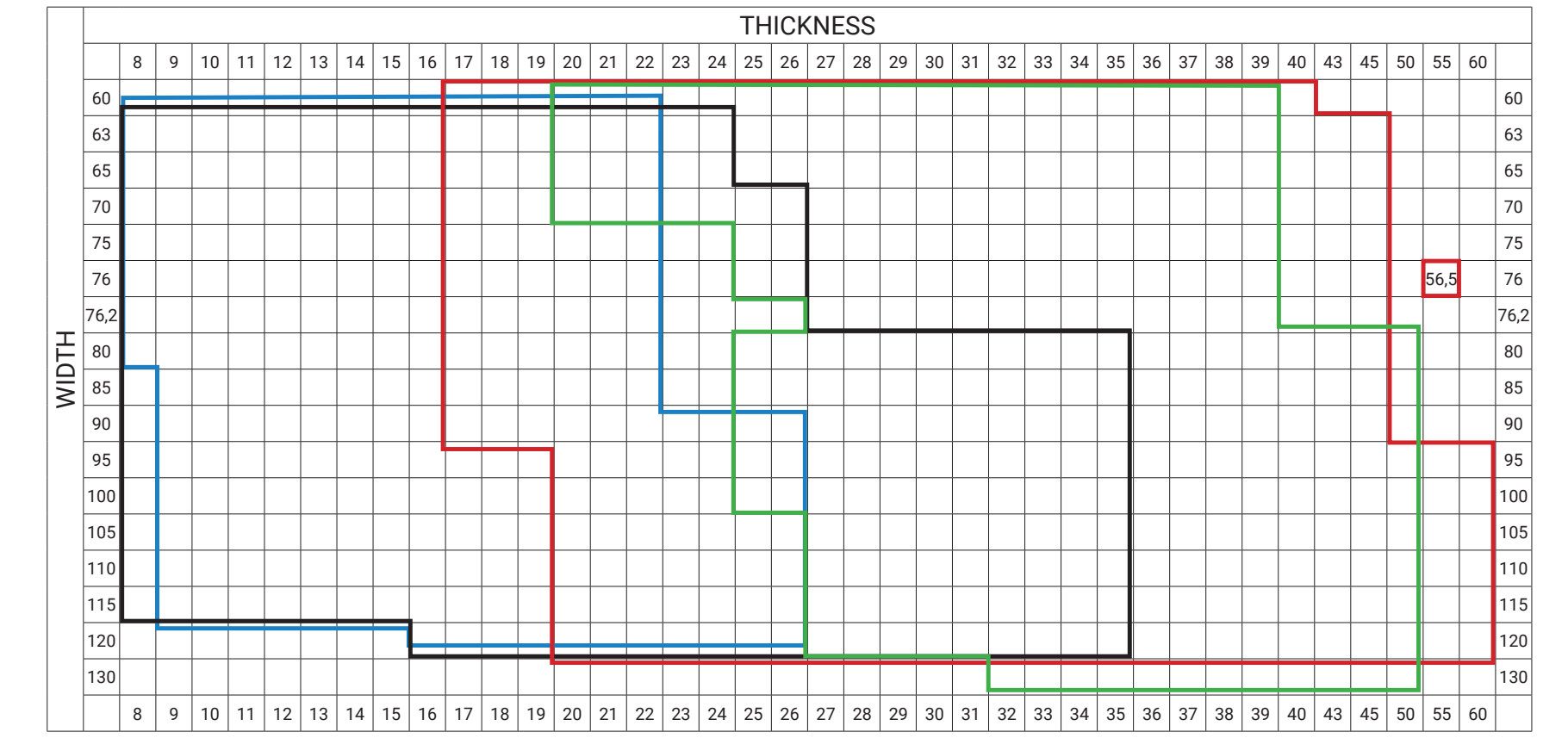
PRODUCTION PROCESS



FLAT BARS SIZE TABLE

FLATS SIZE RANGE
Width Range : 60 - 130 mm
Thickness Range : 8 - 60 mm

LARGE FLATS SIZE RANGE
Width Range : 200 - 400 mm
Thickness Range : 80 - 200



EN 10058
B-1017

EN 10092-1A
D-59145

EN 10092-1B
C-4620

EN 10092-1C
A-59146