



PROFILES, SECTIONS,  
RODS, BARS AND TUBES

***impol***  
Aluminium Industry



PROFILES AND SECTIONS

Extruded products, i.e. profiles and sections from aluminium and aluminium alloys are extruded semi-products of specific shapes and lengths. Characteristics of aluminium are its lightness, decorativeness, corrosion-resistance (anodising treatment), weldability and workability.

Based on production capacity, Impol ranks among medium-sized European manufacturers. The proof of its competitive ability is the fact that the majority of stronger competitors appear mainly in their domestic markets, while Impol exports the majority of its products to the most demanding European markets. Next to quality, partnership and satisfaction is our the most important offer to our customers. All the employees of the Impol Extrusion Plant care for the quality of our products.

According to their shape, extruded products are divided into full and hollow sections, and sections of standard shapes, full and semi-hollow sections, standard and shaped tubes, and tubes with external or internal profiling, respectively.

Recently the facility has been modernised with an installation of a direct extrusion press of 40 MN. Sections with external diameter or circumscribing circle, respectively, up to 320 mm are manufactured.

Minimum wall thickness is 1,2 mm, on agreement even 1 mm. Allowable cross section is  $A_{max} = 11.300 \text{ mm}^2$ .

### Impol manufactures sections for the following uses:

- in process industry,
- in transport (trailers),
- in civil engineering,
- furniture,
- sections for bicycle rims,
- manufacturing of building elements (doors, windows, etc.),
- interior design,
- heating (radiators).

The Profile Unit manufactures sections and rods of aluminium and AlMgSi (USA type 6xxx) alloys, with internal designations A30, A31, AC10, AC11, AC22, and AC30. With regard to their purpose of use and further processing, the sections are manufactured in the following tempers: F, T1, T5 and T52. Their chemical compositions and tempers are described by Impol internal standard.

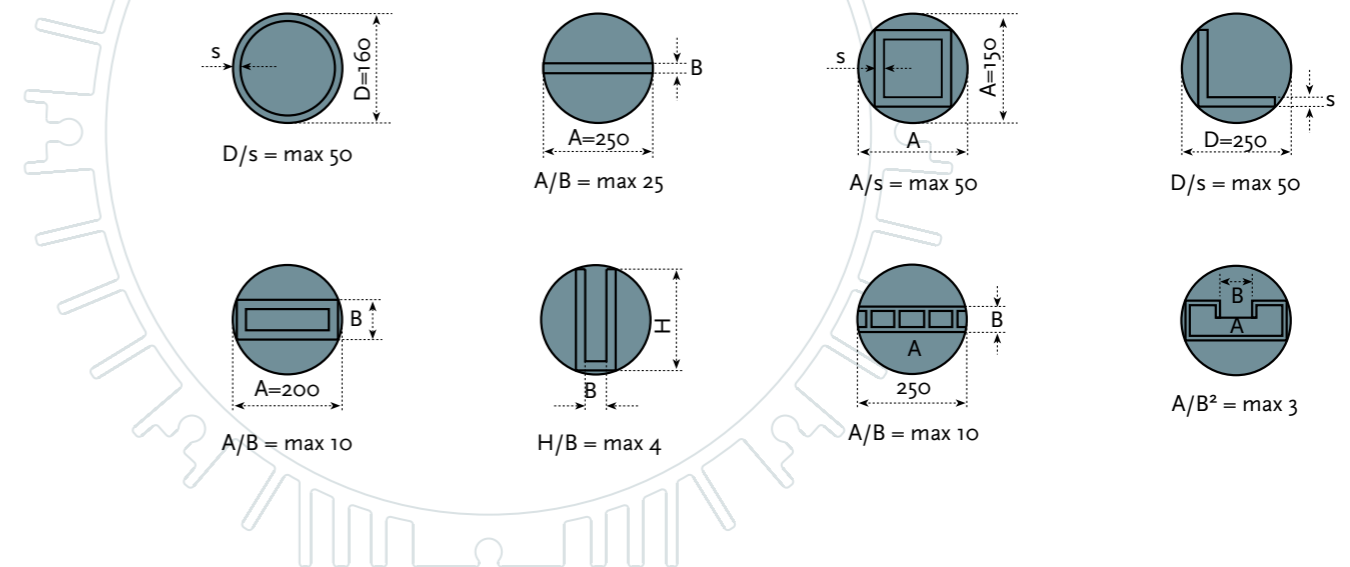
Impol products are harmonized with international standards regarding their chemical composition, mechanical properties, dimension tolerances and surface standards: DIN, ASTM, NF, EN, etc. In agreement with the customer, sections can be made also according to other (internal) standards.

From the very beginning, we cooperate with the customer in developing a new product, i.e. in selection of alloy, determining temper, dimensions, packaging, and other details, according to customer's requests. When customer agrees with the quality of provisional production of a new profile, regular production can be started. Parallel to development of a new profile, the development of a new tool must be prepared. Tools are kept in store, with appropriate surface protection.

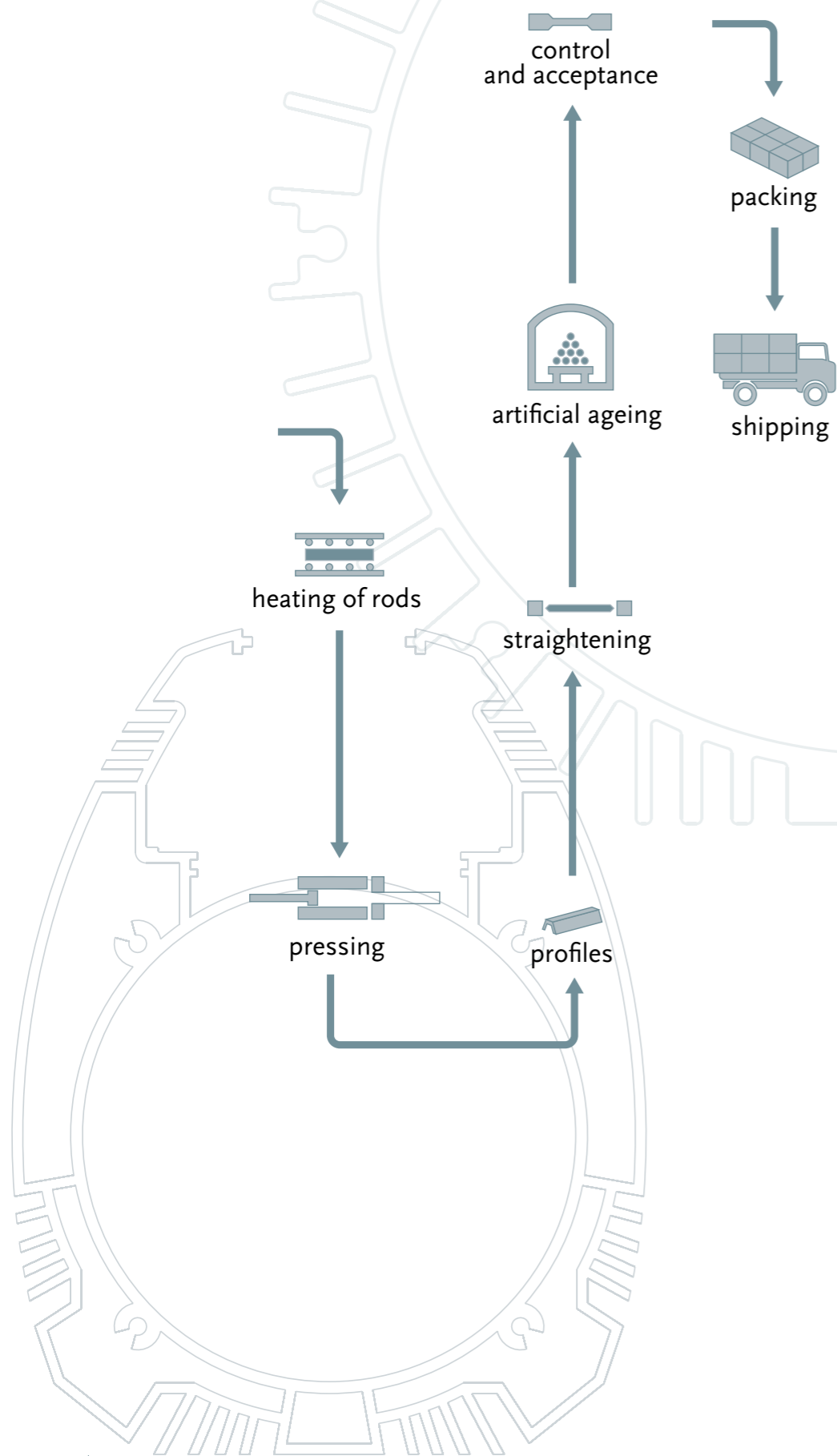
Production programme of Impol includes over 4,000 different profiles and sections, from standard to the most demanding sections in order to satisfy the needs of individual customers. Our orientation towards the production of sections that corresponds to the most specific requests of our customers for particular applications and further processing ensures our competitive advantage for a wide range of customers.

All sections being developed for individual customer become his industrial property, which means that they cannot be ordered by anyone else without his prior permission.

### DIMENSIONAL LIMITATIONS OF PROFILES AND SECTIONS



PRODUCTION PROCESS OF PROFILES AND SECTIONS



RODS, BARS AND TUBES

Impol has a tradition of several decades in the production and processing of aluminium, especially in the field of extruded and drawn rods, bars, tubes and profiles. Impol's own casting house with a capacity of 70.000 tons of ingots, its electric and gas furnaces and a continuous homogenising furnace enable to produce rods, bars, tubes and profiles from over 40 alloys.

The foundry supplies cast homogenised billets of all standard qualities or a quality to customer's demand. After homogenization, billets are 100% ultrasonic controlled in order to ensure the quality of our products even for the most demanding customers (automotive and aircraft industry, etc.)

### Fields of use of rods, bars, tubes and profiles include:

- the automotive and aircraft industries,
- machine building,
- transport,
- interior design,
- electrical industry,
- civil engineering.

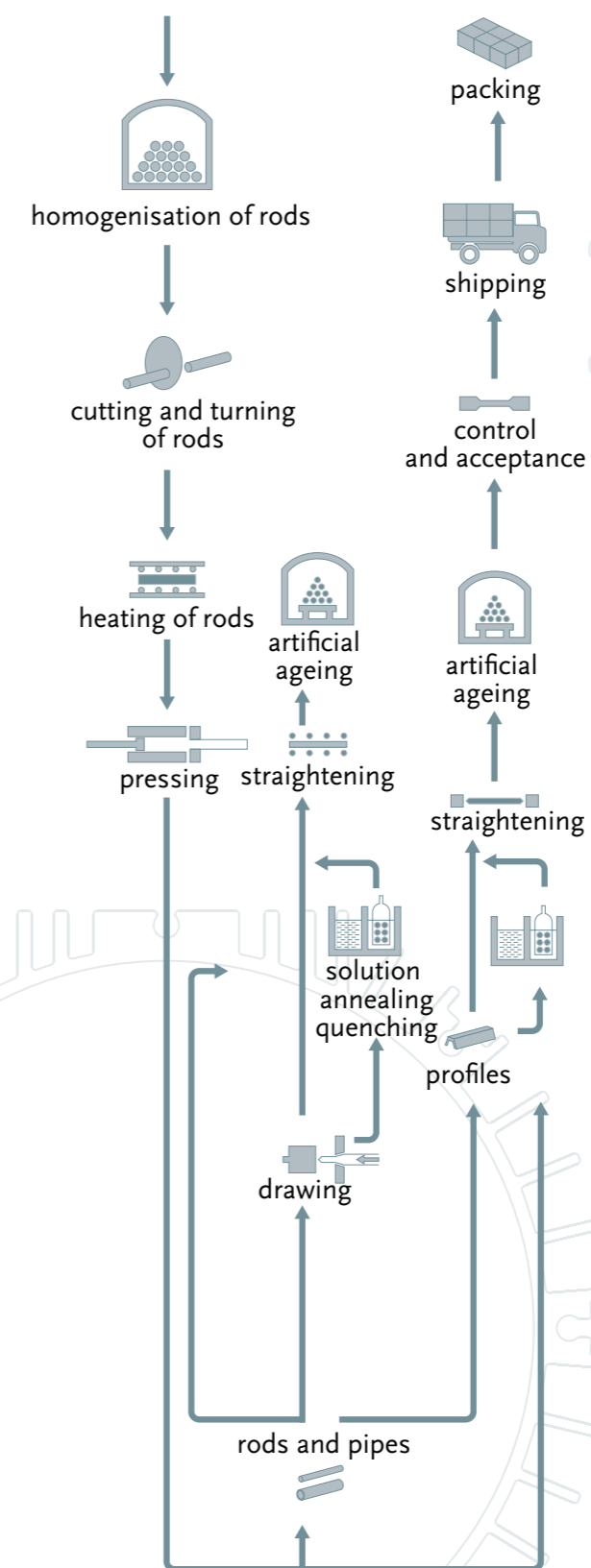
The process of the production of rods, bars and tubes includes operations which enable the production of high quality heat-treated materials: homogenisation and turning of billets, heating of billets and extrusion in the most state-of-the-art press, drawing, heat treatment and straightening and cutting.

Pressing ensure a high quality of extrusion. The procedures of indirect and direct extrusion are used.

Cold processing (drawing) of products takes place on standard drawing machines and continuous drawing lines (drawing, straightening, cutting to length). In accordance with international standards, Impol produces extruded and drawn rods and tubes in all standard dimensions. hard alloys, which are not so easily worked or even difficult to work, predominate. Special attention is given to stress-free states of materials, to free-cutting alloys and to rods for forging.

After the production process, the products can be 100% ultrasonic controlled on customer's demand.

### PRODUCTION PROCESS OF RODS, BARS AND TUBES



## MECHANICAL EQUIPMENT

SOFT ALLOYS PLANT	12.5 MN	20 MN	28 MN	40 MN
Diameter of input pole (mm)	152	203	228	279.4-282
Possible sections (mm <sup>2</sup> )	180-550	400-1500	700-3700	2000-11300
Possible length of section (mm)	1700-7530	1500-12400	1500-8400	1500-12000

HARD ALLOYS PLANT	20 MN	35 MN	55 MN
Diameter of input pole (mm)	218	275	279.4-282
Possible sections of products (mm <sup>2</sup> )	35-3340	300-12670	314-25000
Possible length of products (mm)	2000-6000	2000-12000	2000-8000

Other than above, shorter lengths of sections are possible based on buyer's requirements.

## AVAILABLE DIMENSIONS OF IMPOL PRODUCTS

### ROUND SECTION RODS

#### Extruded

Alloys series 6xxx and 1xxx

$d = 8 - 180 \text{ mm}$  755/3

Standard length: 2 - 6 m depending on dimension and alloy or based on buyer's requirements.

Other series of alloys

$d = 20 - 180 \text{ mm}$  755/3

Standard length: 2 - 6 m depending on dimension and alloy or based on buyer's requirements. Applies to other series of alloys.

#### Drawn

Alloys series 1xxx, 6xxx and 2011

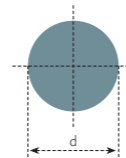
$d = 5.50 - 76.20 \text{ mm}$  754/3

Length 2.0 m to max 4.5 m or based on buyer's requirements.

Other series of alloys

$d = 7,0 - 76,20 \text{ mm}$  754/3

Length 2.0 m to max 4.5 m or based on buyer's requirements.



## HEXAGONAL SECTION RODS

### Extruded

Alloy series 6xxx and 1xxx

$s = 8 - 120 \text{ mm}$  755/6

Standard length: 2 - 6 m depending on dimension and alloy or based on buyer's requirements.

Other series of alloys

$s = 20 - 120 \text{ mm}$  755/6

Standard length: 2 - 6 m depending on dimension and alloy or based on buyer's requirements.

### Drawn

Alloy series 1xxx, 6xxx and 2011

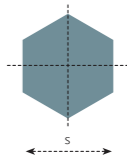
$s = 5.0 - 60.00 \text{ mm}$  754/6

Length 2.0 m to max 4.5 m or based on buyer's requirements.

Other series of alloys

$s = 7 - 60 \text{ mm}$  754/6

Length 2.0 m to max 4.5 m or based on buyer's requirements.



## FLAT RODS AND BARS

### Extruded

Alloy series 6xxx and 1xxx

$h = 2 - 100 \text{ mm}$   $w = 10 - 250$  755/5

Standard length: 2 - 6 m depending on dimension and alloy or based on buyer's requirements.

Other series of alloys

$h = 10 - 100 \text{ mm}$   $w = 20 - 140 \text{ mm}$  755/5

Max. height and width of flat section rods depends on the diameter of the outlined circle of max 180 mm.

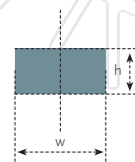
Standard length: 2 - 6 m.

### Drawn

All alloy series based on buyer's requirements.

$h = 10.0 - 50.0 \text{ mm}$   $w = 12.70 - 76.20 \text{ mm}$  754/5

Length 2.0 m to max 4.5 m or based on buyer's requirements.



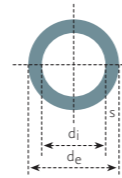
## TUBES

### 1. Seamless tubes – standard extrusion process

#### Extruded

External diameter  $d_e = 25 - 90$  mm  
 Internal diameter  $d_i = 16 - 74$  mm  
 Wall thickness  $s = 2.5 - 25$  mm

755/7



Standard length: 2 – 4.5 m or based on buyer's requirements.

#### Rolled

External diameter  $d_e = 25 - 76.20$  mm  
 Internal diameter  $d_i = 16 - 74$  mm  
 Wall thickness  $s = 2.5 - 25$  mm

754/7

Standard length: 1 – 4.5 m or based on buyer's requirements. The listed dimensions for rolled and extruded pipes are limited by minimum and maximum weight of pipe per meter (min. 1.5 kg/m and max. 9 kg/m)

### 2. Pipes with seam – chamber extruded tubes

#### Extruded

External diameter  $d_e = 10 - 250$  mm  
 Wall thickness  $s = 1.5 - 25$  mm

755/8

Square section pipes are available in the following dimensions:  
 from 10x10xs to 220x220xs:  $s = \text{wall thickness}$

### 3. Ferrules – oval tubes

In accordance with DIN 3093 standard, from no. 16 to 32

3093

## SECTIONS

Sections are manufactured up to outline circumscribing of 320 mm and section height of 250 mm.

Dimension limitations depending on extruding machines and extruding production lines.

## COMPARATIVE TABLE OF MATERIALS

- Free-cutting alloys
- Alloys for forging
- Other alloys

We can accommodate also buyer's special requirement other than standard. However only, if the existing technology and machinery facilitate the above.

### FREE-CUTTING ALLOYS

Alloy EN	Temper EN	Form				Tubes	Profiles
		round	square	hexagonal	flat		
EN AW-2011	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-2030	EN 754-2	x	x	x	x		
EN AW-2007	EN 755-2	x	x	x	x		x
EN AW-6012	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-6262	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-2011	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-2028A	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-2030	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-2044	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-2041	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-6012	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-6026	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-6028	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-6262A	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-6064	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x

ALLOYS FOR FORGING, WHICH ARE AVAILABLE ALSO IN OTHER TEMPER

Alloy EN	Temper EN	Form					
		round	square	hexagonal	flat	Tubes	Profiles
EN AW-2014	EN 754-2	x	x	x	x		
EN AW-2014A	EN 755-2	x	x	x	x		x
EN AW-2017	EN 754-2	x	x	x	x		
EN AW-2017A	EN 755-2	x	x	x	x		x
EN AW-2030	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-2618	EN 754-2	x	x	x	x		
EN AW-2618A	EN 755-2	x	x	x	x		x
EN AW-4032	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-6012	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-6026	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-6056	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-6082	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-6182	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-6262A	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-7010	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-7022	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-7049	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-7075	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x

OTHER ALLOYS

Alloy EN	Temper EN	Form					
		round	square	hexagonal	flat	Tubes	Profiles
EN AW-1050 A	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-1070 A	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-1350	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-2014 A	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-2017 A	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-2024	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-2028A	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-2618A	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-3003	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-3103	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-4043 A	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-4047 A	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-5019	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-5051A	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-5052	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-5083	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-5754	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-6005,6005 A-in B	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-6023	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-6060	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-6061	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-6063	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-6951	EN 754-2	x	x	x	x	x	
	EN 755-2	x	x	x	x	x	x
EN AW-7020	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x
EN AW-7049 A	EN 754-2	x	x	x	x		
	EN 755-2	x	x	x	x		x

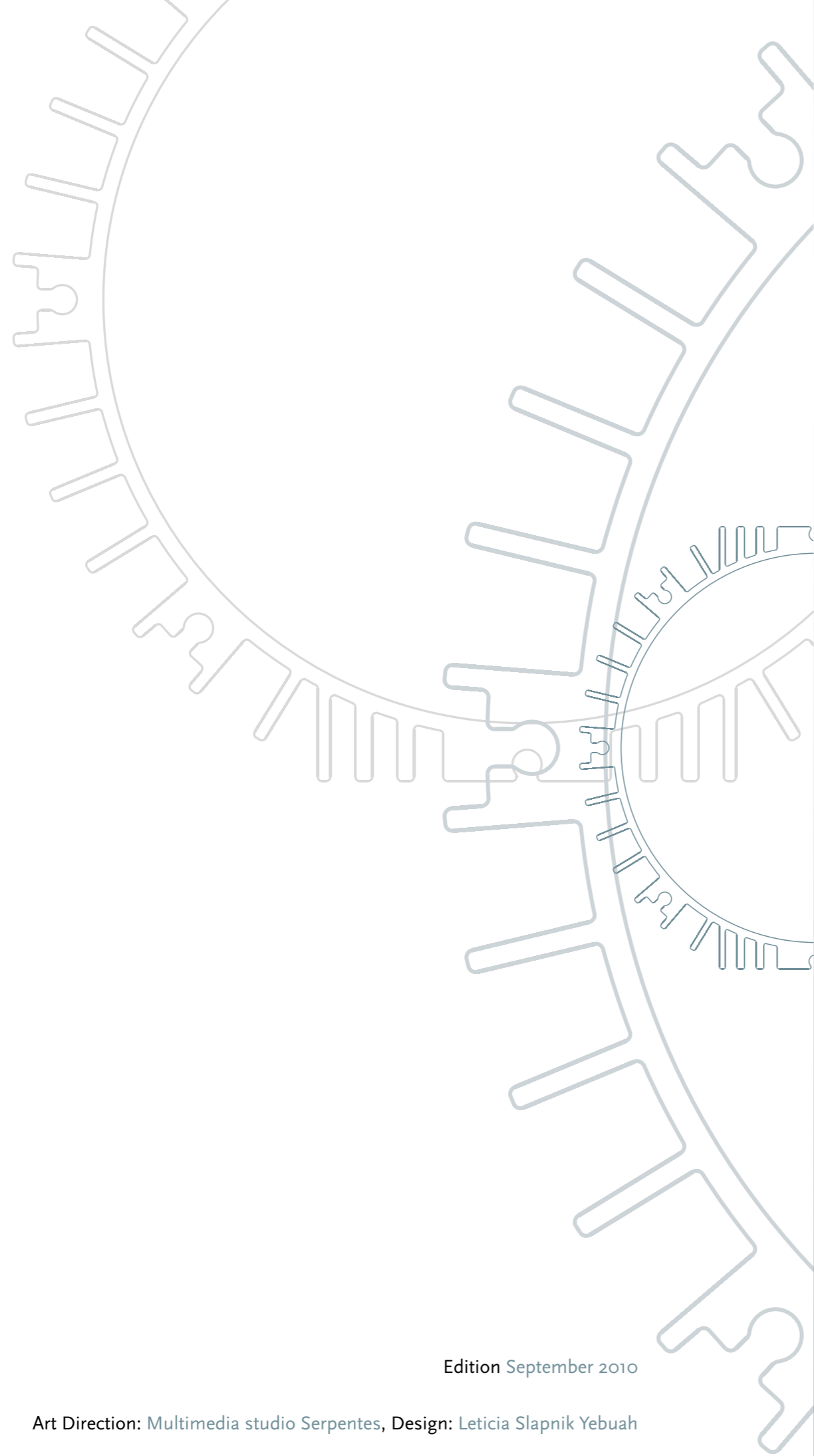
FREE-CUTTING ALLOYS

Alloy				Temper				Form					
Impol	EN	DIN	ASTM	Impol	EN	DIN	ASTM	round	square	hexagonal	flat	Tubes	Profiles
D5o	EN AW-2011	AlCuBiPb	2011	F				x	x	x	x	x	x
	EN AW-AlCu6BiPb	WN 3.1655		T3	T3	F28,30,32	T3	x	x	x	x	x	x
				T4	T4		T4	x	x	x	x	x	
				T6	T6			x	x	x	x	x	x
				T8,HT8	T8	F37	T8	x	x	x	x	x	
D6o	EN AW-2030	AlCuMgPb	2030=2007	F				x	x	x	x		x
	EN AW-AlCu4PbMg	WN 3.1645		T4	T4, T4510	F34, 37		x	x	x	x		x
	EN AW-2007	AlCuMgPb		T3, HT4, T8	T3, T351	F34, 37		x	x	x	x		
AC41	EN AW-6262		6262	F				x	x	x	x	x	x
	EN AW-ALMg1SiPb			T8	T6, T8, T9		T6, T651, T9	x	x	x	x	x	
				T6	T6		T6, T6510, T6511	x	x	x	x	x	x
AC42	EN AW-6012	AlMgSiPb	6012	F				x	x	x	x	x	x
	EN AW-ALMgSiPb	WN 3.0615		T3	T4	F20		x	x	x	x	x	x
				T8	T6	F28		x	x	x	x	x	x
				T6	T6,T6510	F28		x	x	x	x	x	x
AC6o			T3				x	x	x	x		x	
6012 I			T8				x	x	x	x		x	
ALMgSiSn			T6				x	x	x	x		x	
D8o			T3				x	x	x	x		x	
AlCuMgSn				T8				x	x	x	x		x
				T4				x	x	x	x		x

OTHER ALLOYS 1/2

Alloy				Temper				Form					
Impol	EN	DIN	ASTM	Impol	EN	DIN	ASTM	round	square	hexagonal	flat	Tubes	Profiles
A30	EN AW-1050A	Al 99,5	1050	F	F, H112	F7		x	x	x	x	x	
	EN AW-Al99,5	WN 3.0255		O, OH, H111	O, H111	W7		x	x	x	x	x	
				H14	H14	F10		x	x	x	x	x	
				H18	H18	F13		x	x	x	x	x	
A31	EN AW-1350A	E-Al	1350	F	F, H112	F7		x	x	x		x	
	EN AW-E Al99,5A	WN 3.0257		H14		F10		x	x	x	x		x
				H18		F13		x	x	x	x		x
D30	EN AW-2017A	AlCuMg1	2017	F				x	x	x	x		
	EN AW-AlCu4MgSi(A)	WN 3.1325		O	O		O	x	x	x	x		
				HT4, T351	T3, T351	F38	T4	x	x	x	x		
				T4, T4510	T4, T4510	F36, F40		x	x	x	x		
D31	EN AW-2014A	AlCuSiMn	2014	F				x	x	x	x		
	EN AW-AlCu4SiMg(A)	WN 3.1255		O, OH	O, H111		O	x	x	x	x		
				HT4, HT6	T3, T4, T6	F44	T4, T6	x	x	x	x		
				T6, T6511	T6, T6510	F43, F46	T6, T6510	x	x	x	x		
D40	EN AW-2024	AlCuMg2	2024	F				x	x	x	x		
	EN AW-AlCu4Mg1	WN 3.1355		O, OH	O, H111		O	x	x	x	x		
				HT4, HT6, T851	T3, T351, T6, T851	F44	T4, T351, T851	x	x	x	x		
				T4, T3510, T8510	T3, T3510	F40, F47	T3, T3510, T8510	x	x	x	x	x	x
M10	EN AW-3103	AlMn1	3103	F	F, H112	F10		x					
	EN AW-AlMn1	WN 3.0515		O, OH	O, H111	W10		x				x	
				H14	H14	F13		x	x	x	x	x	
				H18	H18	F16		x	x	x			
M11	EN AW-3003	AlMnCu	3003	F	F, H112		F	x				x	
	EN AW-AlMn1Cu	WN 3.0517		H14	H14	F15	H14	x	x	x	x	x	
				H18	H18	F19	H18	x	x	x			
AS50	EN AW-4043A	S-AlSi5	4043	F		zh		x	x	x	x		
AS60	EN AW-4047A	S-AlSi12	4047	F		zh		x	x	x	x		
P12	EN AW-5051A	AlMg1, 8	5051A	F	F, H112	F15							x
	EN AW-AlMg2(B)	WN 3.3326		O	O, H111	F15							x
P20				F									x
				OH									x
				H24									x
				H18									x

Alloy				Temper				Form					
Impol	EN	DIN	ASTM	Impol	EN	DIN	ASTM	round	square	hexagonal	flat	Tubes	Profiles
P31	EN AW-5754	AlMg3	5754	F	F, H112	F18		x	x	x	x	x	
	EN AW-AlMg3	WN 3.3535		O, OH, H111	O, H111	W18		x	x	x	x	x	
				H14	H14	F25		x					
P32	EN AW-5052	AlMg2,5	5052	F	F, H112		F	x	x	x	x	x	
	EN AW-AlMg2,5	WN 3.3525		O, OH	O, H111	W17	O	x	x	x	x	x	
P33		S-AlMg3		F		zh		x	x	x	x		
P50	EN AW-5019	AlMg5		F	F, H112	F25		x	x	x	x		
P51	EN AW-5019		5056	O, OH,	O, H111		O, H111	x	x	x	x		
				H14	H14	F28	H14	x	x	x	x		
P53	EN AW-5356	S-AlMg5	5356	F, O		zh		x	x	x	x		
P54	EN AW-5083	AlMg4,5Mn	5083	FH, F, OH	F	F27	F, H111	x	x	x	x		
AC10	EN AW-6060	AlMgSi0,5	6060	F				x	x	x	x	x	x
	EN AW-AL Mg SI	WN 3.3206		T4, T3	T4	F13		x	x	x	x	x	x
				T6	T66	F22		x	x	x	x	x	x
				T8	T6	F22		x	x	x	x		
AC30	EN AW-6082	AlMgSi1	6082	F				x	x	x	x	x	x
	EN AW-AlSi1MgMn	WN 3.2315		T4, T3	T4	F21		x	x	x	x	x	x
				T6	T6	F28, 30, 31		x	x	x	x	x	x
				T8	T6	F28, F31		x	x	x	x		
AC40	EN AW-6061	AlMg1SiCu	6061	F, T6510	T6510			x	x	x	x	x	x
	EN AW-AlMg1SiCu	WN 3.3211		OH	O, H111	W	O	x	x	x	x	x	
				T4, T3	T4	F21	T4	x	x	x	x	x	x
				T6, T6511	T6	F29	T6, T6511	x	x	x	x	x	x
				T8	T6	F29	T6, T651						
PD12				T1				x	x	x	x		
				T6				x	x	x	x		
PD14	EN AW-7020	AlZn4,5Mg1	7020	F				x	x	x	x		
	EN AW-AlZn4,5Mg1	WN 3.4335		T6, T8	T6	F35		x	x	x	x		
PD16	EN AW-7022	AlZnMgCu0,5	7022	F, FH				x	x	x	x		
	EN AW-AlZn5Mg3Cu	WN 3.4345		HT6, T8, T6	T6	F46, 47, 49		x	x	x	x		
				T6510	T6510	F47, F49		x	x	x	x		
PD30	EN AW 7075	AlZnMgCu1,5	7075	F, FH				x	x	x	x		
	EN AW-AlZn5,5MgCu	WN 3.4365		OH	O, H111		O	x	x	x	x		
				T6, HT6, T6510	T6, T6510	F50, 51, 52	T6, T651, T6510	x	x	x	x		
PD33	EN AW-7049A		7049	F, FH				x	x	x	x		
	EN AW-AlZn8MgCu			T6, HT6	T6			x	x	x	x		



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