

FOILS





ON THE RIGHT PATH

The enterprise Impol prides itself upon an outstanding business tradition which goes all the way back to the year 1825. Aluminum has been processed since 1950.

Activity of the business group Impol is the processing of aluminum into rolled, pressed, drawn, forged and other kinds of products which ensure the customer the optimum quality. In its environment Impol is considered as an enterprise which sets itself high goals and tends to achieve them even better. All this provides us with the following virtues: high-quality, flexibility and speed, reliability and confidence, affiliation toward the enterprise, teamwork and constant training. We fulfill our goals and expectations of our business partners by use of the integrated system for the quality assurance. The business excellence is the foundation of the company and of the group which ensures a proper realization of our company's goal projection - to become a successful international enterprise.

In the year 2003 and as an upgrade of the standard ISO 9001:2000 we took all the necessary measures for the acquisition of the quality standard ISO TS 16964 for automobile industry. We at Impol are conscious of the fact that our orientation plays an important role regarding the environment. By the environmental standard system ISO 14001 the harmful effect of the emissions on the environment is thus prevented. In accordance with the certificate OHSAS 18001 Impol maintains a high level of security regarding the health and general safety of its workers.

We at Impol are proud to be a part of "aluminium story". Aluminium is a metal without which one can only hardly imagine the everyday life, and which will stronger still shape the future of mankind.

We're now living the
life that was once
dreamed of. Welcome
to the aluminium age!



ALUMINIUM FOIL

During all of its lives
it allows itself to be
rolled like dough or
extruded, and, ever
pliant, it fills a
mould to take on a
temporary meaning.

Aluminium foil is one of the most important and most widespread cold-rolled aluminium and aluminium-alloy product, and is mainly used in consumer products.

Long life-time, low price and a unique combination of properties are additional arguments in favour of the utility of aluminium foil in the most varied fields of use. Aluminium foil is also environmentally friendly, since it can be recycled and reused.

Aluminium foil properties:

The chemical composition of individual alloys defines their specific properties, but the following properties are common to all alloys:

- Aluminium foil does not react with the majority of organic substances.
- Its resistance to chemical action depends on individual compounds or its components.
- Corrosion occurs in salt media, but foil for such purposes is pretreated or laminated, which prevents direct contact with medium.
- Alimentary products do not react with aluminium foil.
- Aluminium foil is opaque.



Most important applications of aluminium foils

- **foils for further processing:** suitable for processing such as laminating, colouring, printing etc. It is used for packaging in the food industry, confectionery, cosmetics, pharmaceutical and tobacco industries.
- **foils for technical purposes:** for example smooth or textured insulation foil, intended for further processing with bitumen or other insulating materials; foil for cable wrapping; foil for self-adhesive tapes, capacitor foil, honeycomb foil etc.
- **household foils**

Such varied fields of use result from the excellent properties of aluminium foil: low density, high electrical conductivity, good plasticity, corrosion-resistance, high reflectivity, opacity, non-toxicity, and the possibility of achieving a very attractive effects through further processing.

I shall make you an
aluminium statue. If
you don't like it,
I can change it into
anything you desire,
as often as you wish.



TECHNOLOGICAL PROCESS OF FOIL MANUFACTURING

Remarkably light,
firm and strong.
Loves to beat
extreme challenges
like the expanse of
the sky and depths
of the oceans.

Cold-rolled coils (commercially known as foil-stock) serve as input raw material in manufacturing foils. The basic input material for Foil Plant is cold-rolled strip with a thickness of 0,3 mm which is rolled in four-high rolling mills to the desired foil thickness. Foils produced in this manner are single or doubled, which means that two foils are rolled simultaneously. The external sides that were in contact with working rolls are bright, while the inner sides where the two foils are in contact remains matt. Rolling procedure for doubled foils is used in making all the foils with final thickness of 0,050 mm or less. The production process is based on modern technological principles and most up-to-date technology.

Most of foils are annealed in furnaces. Annealing enables achievement of final properties of the aluminium foil. At the same time the residuals of rolling oil used in the rolling process are evaporated off; such a foil is degreased and sterile. This is essential for use in food industry.

The health hazards with the aluminium foil are checked by the Institute of Public Health in Maribor.



Packaging

Aluminium foil is supplied in coil on various cores. After final trimming and cutting, foil is coiled to the desired external diameter or in the desired length. Steel or aluminium cores are used for coiling, and their dimensions depend on foil thickness and width, customer's requirements, shipping and other factors.

Packaging is performed exclusively according to the customer's wish and our capabilities. Impol's standard packaging methods includes packaging into boxes, onto pallets, or onto pallets and then into boxes. Special packaging is subject to agreement with the customer. Such packaging is returnable and reusable.

Each shipment is accompanied with a certificate of foil quality and a statement of the standards to which it has been manufactured. The certificate of quality also proves suitability of materials.



ALUMINIUM FOIL DIMENSIONS AND APPEARANCE

Not all that shines is
silver: there's also
moonlight - and
aluminium.

In Impol Foil Production Unit foils of different materials, dimensions and tempers are manufactured:

thickness	width	coil mandrels
0,006 to 0,100 mm	150 to 1600 mm	76 or 150 mm
coil external diameter	temper	
400 to 1000 mm	hard or soft	

Standards and chemical composition

According to EN standard, foil thickness ranges from 0,006 mm to 0,200 mm, thicker foil is referred as strips and sheet metal. Impol Foil Plant manufactures foils of different purity or from different alloys, harmonized with international standards. Most of foils are made according to EN standards, where EN 573-3 standard determines chemical composition, EN 546-2 mechanical properties, EN 546-3 dimensional tolerances, and EN 546-4 other properties. Alloys used in manufacturing raw aluminium foil are presented in the table below, compared also with other standards:

AA	ASTM	DIN	IMPOL	EN	NF	min % Al	alloying elements
1050		Al99,5	A30	EN AW-1050 A	1050 A	99,5	-
1200		Al99,0	AF11	EN AW-1200	1200	99,0	Fe, Si
8011		-	AF61	EN AW-8011 A	8011	-	Fe, Si
8079		-	AF40	EN AW-8079	-	-	Fe, Si
8014		-	AF42	EN AW-8014	-	-	Fe, Mn
5052		AlMg2,5	P32	EN AW-5052	5052	-	Mg, Cr



Standard material tempers for aluminium foil:

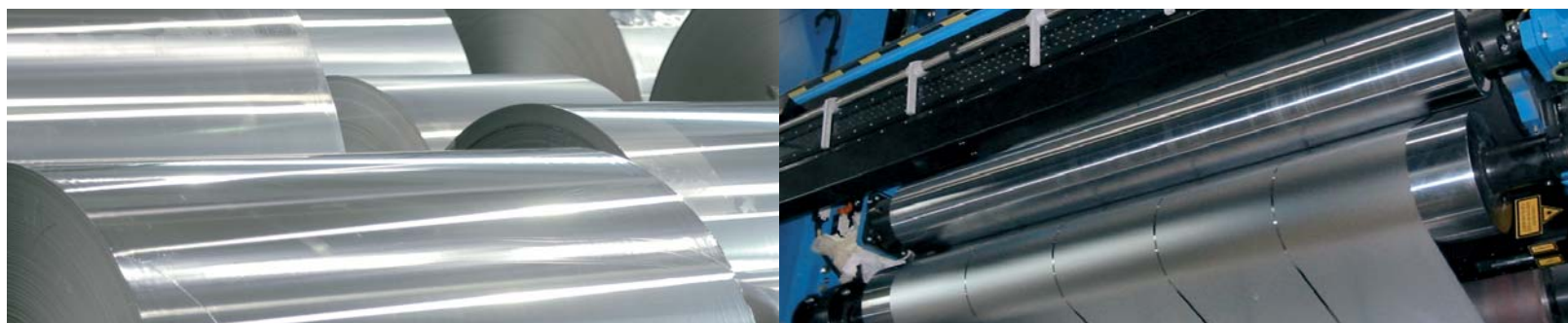
- OH - cold rolled, then soft annealed foil
- GOH - soft annealed foil suitable for deep drawing
- H18 - cold rolled, 4/4 hard
- H19 - cold rolled, extra hard
- GH28 - tempered, 4/4 hard, suitable for deep drawing

The above material tempers correspond to the following international standards: EN 546-2, DIN 1788, AA 9.Foil, NF A 50.471, ASTM 8.foil; or they are adapted to special requirements.

Standard aluminium foil surfaces according to internal nomenclature:

- S11 - matt surface on both sides (mill finish)
- S16 - bright on one side, matt on the other - bright side out
- S17 - bright on one side, matt on the other - dull side out
- S19 - matt surface on both sides, degreased by annealing
- S70 - decorated surfaces with an embossed pattern
- S72 - decorated surfaces with an embossed pattern, degreased

We take from nature
while returning to it
environment-friendly
products.



COMPARATIVE TABLES

With regard to surface appearance, foils are divided into two groups:

- **single foil** (dull on both sides)
- **doubled foil** (bright on one side, dull on the other)

The above mentioned groups of foils are smooth; they can be also textured, thus obtaining

- **embossed foil**

Standard coil dimensions

Tables give standard coil dimensions. Other dimensions are available on agreement.

SINGLE-FOILS*

Thickness (mm)	Width (mm)	Internal diameter (mm)	Standard external diameter (mm)	weight per 1 mm width	
				ID = 70 or 76 mm (kg/mm)	ID = 150 mm (kg/mm)
0,050-0,100	150-1300	70, 76 or 150	400-450	0,311-0,396	0,277-0,363
			450-500	0,363-0,458	0,363-0,458
			500-550	0,492-0,598	0,458-0,564
			550-630	0,598-0,788	0,564-0,754
			650-730	0,840-1,062	0,806-1,028
			700-800	0,975-1,278	0,942-1,244

* Al or Fe cores

DOUBLED FOILS*

Thickness (mm)	Width (mm)	Internal diameter (mm)	Standard external diameter (mm)	weight per 1 mm width	
				ID = 70 or 76 mm (kg/mm)	ID = 150 mm (kg/mm)
0,006-0,015	250-1600	76 or 150	400-450	0,311-0,396	0,277-0,363
			450-500	0,396-0,492	0,363-0,458
			500-550	0,492-0,598	0,458-0,564
			550-630	0,598-0,788	0,564-0,754
			650-730	0,840-1,062	0,806-1,028
			800-880	-	1,244-1,515
	930-1000	-	1,697-1,969		
0,016-0,050	150-1600	76 or 150	400-450	0,311-0,396	0,277-0,363
			450-500	0,396-0,492	0,363-0,458
			500-550	0,492-0,598	0,458-0,564
			550-630	0,598-0,788	0,564-0,754
			650-730	0,840-1,062	0,806-1,028
			800-880	-	1,244-1,515
	930-1000	-	1,697-1,969		

* Fe coil cores

EMBOSSED (DECORATED) FOILS*

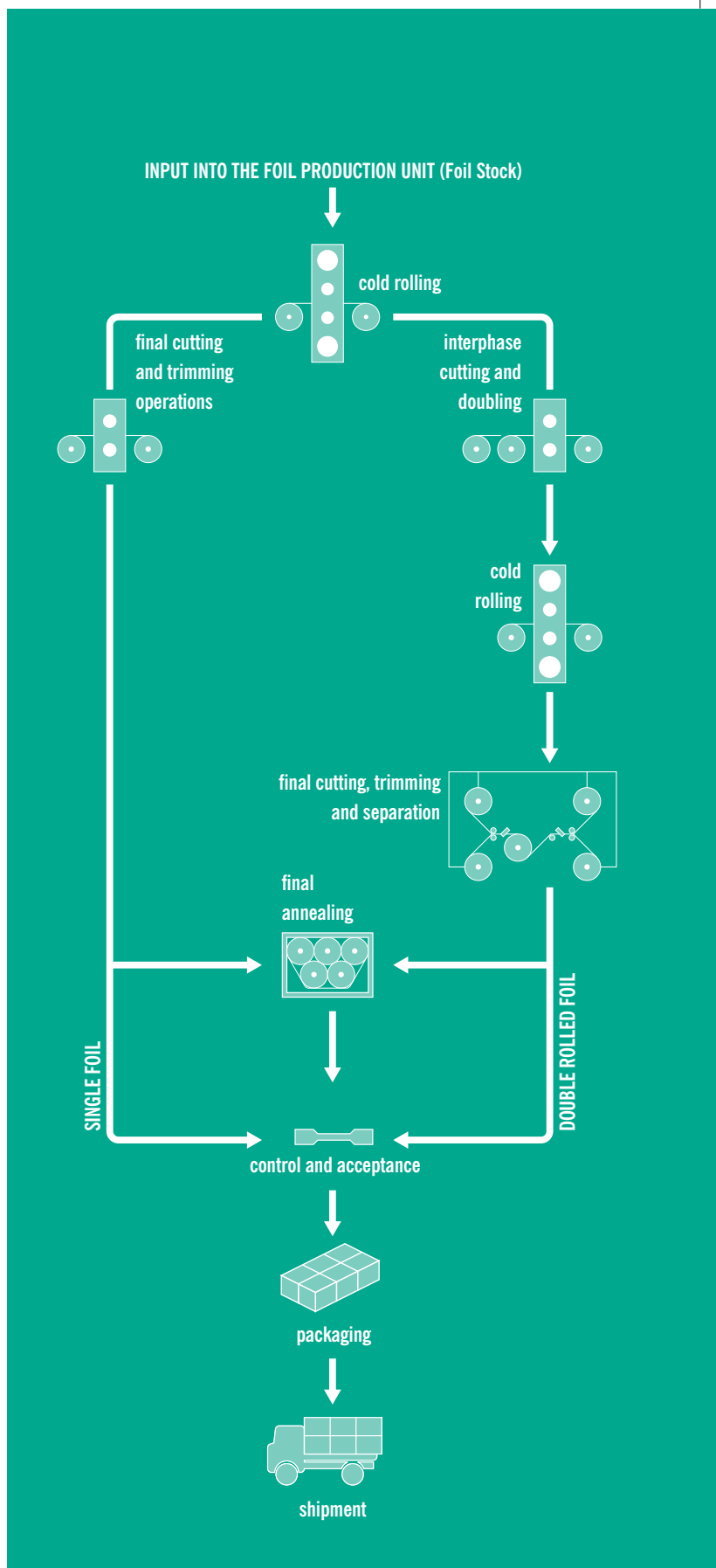
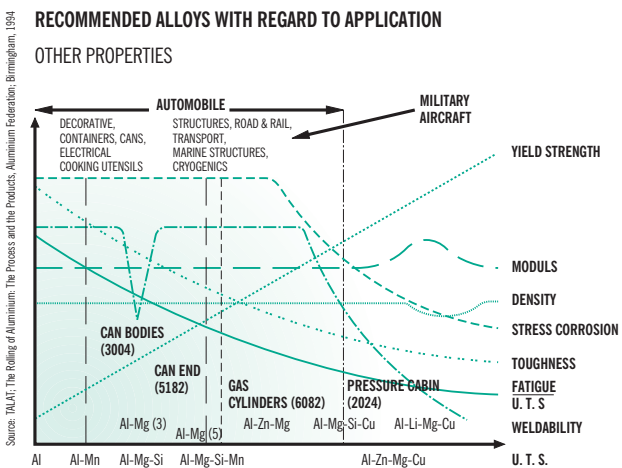
Thickness (mm)	Width (mm)	Internal diameter (mm)	Standard external diameter (mm)	coil weight
				(approx. for standard width 1000 mm - kg)
0,025-0,100	up to 1020	70 or 76	up to 350	up to 50
		150	up to 1000	up to 400

* Al or Fe cores

PRODUCTION IN IMPOL

In order to prevent misunderstandings, please state the following data in your order:

- quantity,
- material and its temper,
- dimensions,
- coil size and type of coil mandrel,
- required standards,
- purpose of use.





Impol d.d.
Partizanska 38
2310 Slovenska Bistrica
SLOVENIA

Tel.: +386 (0)2 845 3100
Fax: +386 (0)2 818 1219
info@impol.si
www.impol.si