

Precision extrusion

EN-755-9 and EN-12020-2 are the accepted norms for the extrusion of aluminium profiles. They allow deviations of 0.15 mm or more. Mifa ignores these norms and applies precision extrusion of 0.02 mm. We're unique in the world! And it gives countless possibilities.

Bulk production. Standardised work. Inaccurate. These are words that you'll hear often if you ask engineers for the features of extrusion. But there is another option. Mifa's delivery starts from 10 kg, and we offer custom-built products and precision, also for straightness, torsion, concentricity, parallelism, surface roughness and fitting. Add to this the outstanding features of aluminium – post-processing is often not needed – and it becomes clear that precision extrusion would be useful for many applications. Even as a replacement of other techniques and materials.

WHAT IS EXTRUSION?

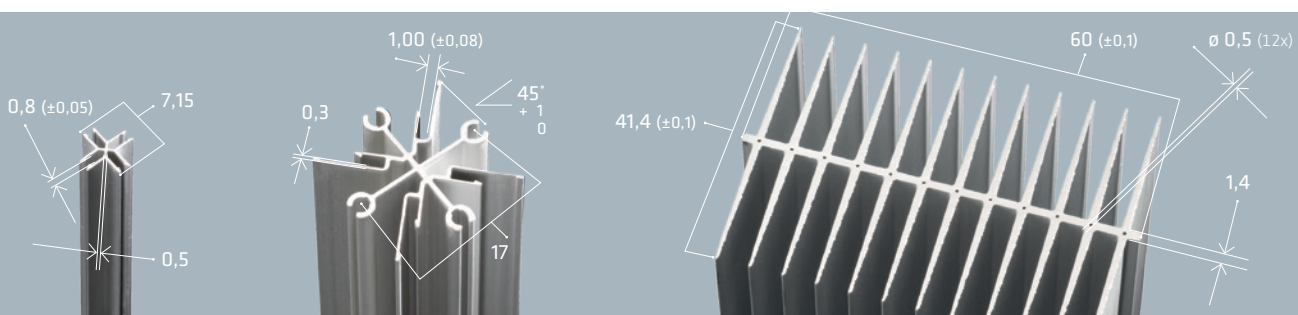
This is a summary of the process of extrusion. Moulders produce a mould based on blueprints of the profile. That mould then enters the extrusion machine. An oven heats a massive stove of aluminium – or magnesium – to several hundred degrees Celsius. As soon as the material is soft enough, it is ready to be pressed through the mould. This happens under high pressure. At the other end of the mould the aluminium comes out in the shape of the mould. The aluminium is then cooled and – as soon as all of it has been pressed through the mould – straightened. After that, it is sawed and, if necessary, treated further.

THE FOUR FACTORS OF PRECISION

Precision extrusion is, as the name implies, very precise work. Control of the pressing process, of the flow of aluminium through the mould, is crucial. For this, four factors are important.

- Knowledge of the elements of the aluminium alloy. Pressing the desired profile requires a perfect composition of materials.
- Not only the temperature of pressing the aluminium is important, but it is also essential that the block of aluminium does not have any temperature variations across its bulk. The temperature after pressing and the cooling process determine the mechanical values.
- Pressing speed and pressure should be entered with great precision, depending on complexity, precision and alloy type. A delicate little job – especially with asymmetrical profiles, as it is impossible in that case to supply the same pressure everywhere.
- The construction of the mould. The mould should have the right shape and be able to handle the pressure.

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KNOWLEDGE, ALSO OF MATERIALS

We have been gaining knowledge and experience of all these factors for almost forty years. They allow us to achieve a great precision – and to guarantee it! Not only for common alloys like 6060, but also for 2014, 3003, 6061, 6063 and plenty of others (see the table). For magnesium alloys we have the same level of precision. The choice of alloy is important for the perfect result. If you want to know more about alloys, you should read the white-paper Materials.

ADVANTAGES FOR THE ENGINEER

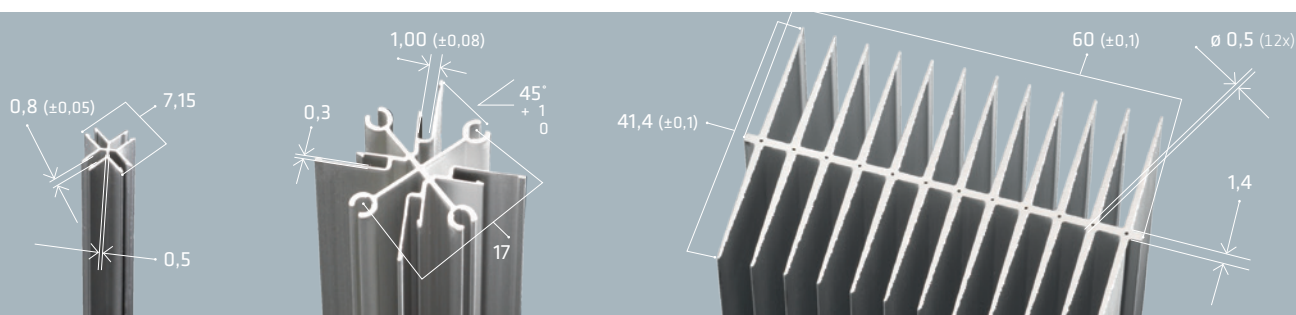
Precision has many advantages, of which the biggest is the enormous amount of freedom in construction. Asymmetrical shapes are no problem, just like varying and very thin walls. Even the most complicated constructions can be realised. And post production is rarely needed, seeing how we deliver precision. This saves polishing, cutting and other operations – and extra costs. Another advantage of aluminium is that you can go thinner than with plastic, because aluminium is stronger. It's also light, doesn't rust and it is good looking, with its high-tech gleaming look. If we need to do some post production, a surface treatment or assemblage after all, we can often do those things ourselves. For this, read the white-paper (title).

MORE POSSIBILITIES THAN YOU'D THINK: AN EXAMPLE

Maybe the product you need is impossible to extrude. That could happen. But maybe an adaptation of the construction offers the solution, without affecting functionality.

Let's look at an example.

We were making a product for a client and wondered if there was anything more we could do for him. He said no: 'I do have this box here, a case for electronics, and we're not too happy with it. But you can't extrude that'. He showed us the box: a top and bottom of curved sheet metal with several things welded and glued onto it. The casing could be closed and opened, so that the electrician could access it to work. It couldn't be extruded in its current shape, but we discussed the matter and decided to change the construction to one that did allow extrusion. The box now consists of two parts, which have been extruded separately. The parts that had to be glued or welded on with the previous construction are now part of the profile. Thanks to our precision the upper and lower parts of the box fit together perfectly, and they can be simply clicked together. The client is very happy with the solution: he doesn't have to weld, glue or assemble anymore, which made the product cheaper, production time lower, and it even looks better.



THE FACTS

The Mifa precision extrusion is unmatched. Our exceptional level of specialisation guarantees dimensional tolerances from ± 0.02 mm. We can achieve ten times more precision than NEN-EN 12020-2, the standard for aluminium extrusion. Our profiles exceed the standard with regard to straightness, torsion, concentricity, parallelism, surface roughness and fit.

TOLERANCE EXTERNAL DIMENSIONS			TOLERANCE WALLTHICKNESS		
From	Till		From	Till	
	10	$\pm 0,15$		1,5	$\pm 0,15$
10	15	$\pm 0,20$	1,5	3	$\pm 0,20$
15	30	$\pm 0,25$	3	6	$\pm 0,25$
30	45	$\pm 0,30$	6	10	$\pm 0,30$
45	60	$\pm 0,40$	10	15	$\pm 0,40$
60	90	$\pm 0,45$	15	20	$\pm 0,50$
90	120	$\pm 0,60$	20	30	$\pm 0,60$

Tolerances according tot NEN-EN 12020-2 unless otherwise stated.

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