ProFix-Plus

The innovative tooling system for precise profiling of solid wood & composite materials

leitz
More efficient, greater performance, more applications

Standards are rising all the time – both in product quality and design. Success against tough competition means your production processes have to be flexible with minimal down time. This has inspired Leitz to develop ProFix-Plus, a complete tooling system.

The latest ProFix – with enhanced concentricity and tool life through design and new technologies – has a wider choice of cutting materials to machine the latest developments in abrasive composites, not only special tungsten carbides and high-speed steel but also diamond.

Two new developments increase the flexibility & performance of ProFix. ProFix F: a flexible profiling system for products of varying widths. ProFix S: achieves previously unattainable knife concentricity, and is designed for feed speeds of up to 60 metres/min.

As the same ProFix profile knife can be mounted in different tool bodies, products can be produced on both through-feed and single component machinery. Equally, the knives in the ProFix body can be quickly changed for those of a different profile, so small repeat batches can be produced economically on one machine.

The design concept – re-sharpenable knives with guaranteed profile consistency – eliminates the need for tool measurement and machine adjustment. You are in production when others are still setting up.

ProFix-Plus is a major advancement in tooling. Its versatility offers benefits both in quality and efficiency in mouldings for doors, windows, stairs, furniture, shop fitting and components for wood constructions.

ProFix-Plus – there's nothing in the world to match this tooling system. Look at it closely – you will be convinced. Make profiles and improve profits with ProFix-Plus.
ProFix is not the same as other universal profiling tools. Its unique features include constant profile and diameter even after re-sharpening as the profile knife thickness decreases. The clamping face stop maintains the knife’s precise radial position. The patented seating guides a re-sharpened knife into precisely the same position when inserted into the tool body.

The positive T-shaped slot clamps the knife on the outer face, in the direction of the centrifugal force. This special design prevents the centrifugal force from moving the knife.
The modular system

Examples of different profile knives that can be used in different sizes of tool bodies. Left: 80 mm body for CNC router. Centre: 125 mm body for 4-side moulder. Right: 180 mm body for double-end tenoner.

ProFix tools have different diameters of tool bodies to match the machines. Depending on the production process and the end-product, the bodies carry between two and six profile knives. A single tool body can be used for knives with completely different profiles, or alternatively, the same profile knife can be mounted in different sizes of tool bodies. This modular system structure and the variety of tool combinations make ProFix an unbeatable all-purpose system for just about every profiling task on either stationary or through-feed machines.

Tool bodies of various sizes for stationary and through-feed machines.
Impressive versatility ...

These are just a small selection of the wide variety of shapes that can be produced with the modular ProFix-Plus system. Similar knives with different profiles can be used in different bodies to suit the type of machine. These features mean a level of versatility and efficiency unmatched by any other tooling system. The all-purpose concept, and the immense scope it offers, means that widely varying demands can be satisfied.

The cutting geometry and the cutting materials are matched to the individual profiling requirements of the specific material.

ProFix-Plus not only extends production run time but also reduces machine set-up time. But the gain in product quality is the biggest contribution to your profitability.

ProFix-Plus profile knives with profile depths of up to 25 mm. Leitz's special "reptile" ground finish & polished clamping surface guarantee razor-sharp cutting edges.
Easy handling is a notable benefit of the ProFix-Plus system. But product quality is an equally important advantage! Further development of the ProFix-Plus knife has taken it to exceptional standards of cutting quality. Leitz's special "reptile" ground finish and polished clamping surface guarantee razor-sharp cutting edges, plus the knives can be re-sharpened with no loss of quality.

No additional adjusting devices or special tools are needed for knife changes. No adjustment to machine settings after re-sharpening, as is often necessary with other cutting systems. ProFix users do not need a comparator to check tool measurements, and test pieces are unnecessary to check workpiece dimensions.
The ProFix-Plus tool family is a significant development to the original Profix design – innovative system components enhance its strengths – resulting in even finer finished products. No other tool system can match this level of flexibility, accuracy and efficiency.

The advantages of the versatile ProFix-Plus make it an ideal tooling system, regardless of whether your machinery and equipment are geared to large, varied production programs or concentrated on specific products.
ProFix F – even more flexible in use

‘F’ stands for even greater flexibility. New ProFix profiling knives in different grades of tungsten carbide suitable for cutting widths up to 100 mm. The ProFix knives can be positioned at any point in the tool body; narrow knives can be used in wide tool bodies with ease. The constant diameter tool design means machine set-up and down-time during a profile change are minimal.

ProFix F is the ideal solution for all four-sided planers & moulders, for double-end tenoners and CNC routers/machining centres where the customer demands a wide range of profiles combined with frequent tool changes.

Knives can be inserted in the machine from left or right as needed.

ProFix F in a VanPlan planerhead, for example used to produce door frame elements of various widths.
ProFix S – for even greater speed and accuracy

Typical assembled tools have run-out tolerances between 0.02 and 0.07 mm at the cutting edges. This means the surface finish is produced by a single cutting edge only, which limits the feed speed if an acceptable quality is to be achieved, e.g. to 12 metre/min at a spindle speed of 6000 r.p.m. ProFix S now offers an entirely new standard of run-out and concentricity on existing production machinery.

ProFix S = High Performance Cutting (HPC)

Radial placement of the knife position by means of a hydrostatic system corrects out-of-roundness tolerances at the cutting edge to below 0.005 mm.

Two profiles, both machined at a feed rate of 36 m/min ($n = 6000 \text{ min}^{-1}$, number of teeth = 4).
Left: using a conventional tool; right: using ProFix S.

ProFix S has fine adjustment to the cutting edges to keep the run-out under 5 μm. Run-out compensation is achieved by radially altering the position of the knife by a hydro system in the tool body.
ProFix-Plus at a glance

<table>
<thead>
<tr>
<th>Continuous machines</th>
<th>Moulder double-end tenoner</th>
<th>Hydroplaner</th>
</tr>
</thead>
</table>

Output high, medium, low

Feed: 3 6 9 12 18 24 30 36 m/min 80

Quality: 6,000 min⁻¹ 8,000 min⁻¹ 12,000 min⁻¹
- 0.6 0.8 0.8
- 1.0 1.1 1.3
- 1.5 1.5 2.0
- 2.0 2.3 3.0
- 3.0 3.0 3.0

ProFix PF 20 PF 25
ProFix S PF 25
ProFix F PF 25

Performance data

<table>
<thead>
<tr>
<th>Performance</th>
<th>ProFix PF 20</th>
<th>Tool with bore</th>
<th>ProFix PF 25</th>
<th>Tool with bore</th>
<th>ProFix F</th>
<th>Tool with bore</th>
<th>ProFix S</th>
<th>Tool with bore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. profile depth</td>
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<td>20</td>
<td>25</td>
<td>25</td>
<td>20-100</td>
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<tr>
<td>Min./max. cutting width</td>
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<td>12-45</td>
<td>12-80</td>
<td>12-100</td>
<td>20-100</td>
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<td>Max. cutting speed</td>
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<tr>
<td>- with steel tool body</td>
<td>m/s</td>
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<td>- with aluminium tool body</td>
<td>m/s</td>
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<td>Inclined knife seating</td>
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* fine alignment with hydro-clamping system

Areas of application

Processing all materials, from solid wood, board and composites through to solid plastic.
For production of mouldings, furniture, doors, windows and stairs, interior shop fitting and wooden construction parts.
On machines such as CNC routers and machining centres, moulders, hydro-planers, double-end tenoners, shapers and Weinig Unimat 2000/3000.

Special features

The only universal tool system with re-sharpenable profile knives which does not lose profile or diameter after sharpening.
Repeatable profiles to drawing, without tool measurement, sample pieces or machine resetting.
High level of overall profitability.
The flexibility of the ProFix system is evident in, for example production of complex doors and furniture profiles. One tool body offers unlimited design freedom simply by changing the profile knives.
ProFix is profitable when flexibility is required. ProFix tools for special applications with their re-sharpening capability are unbeatable where high feed speeds are required, for example in window production, beams or even hand feed applications on spindle moulders.
This chart shows the economics of the ProFix-Plus system compared with throwaway profile tools. Both tools are 180 mm diameter, 40 mm cutting width, and 4 cutting edges.

Whereas a throwaway cutter profile tool needs 15 new knife sets, ProFix-Plus can be re-sharpened at least 15 times. The minimum allowed tip thickness of the ProFix-Plus knives of 0.5 mm is not normally reached until they have been re-sharpened at least 15 times, and only then is a new set required.

The comparison above is based on fact and has been confirmed in practice. The cost saving of around 30% is a convincing advantage for ProFix-Plus. As competition becomes ever intense, costs need to be minimised as your customers become increasingly cost conscious.
The true economies possible with ProFix-Plus are more apparent when costs are compared when a number of profiles are to be produced. With conventional tools, frequent profile changes not only require different profile knives, but also different tool bodies. So the cost of conventional tools is much higher. Even the cost of purchasing tools for only three different profiles can lead to a remarkable cost saving with ProFix-Plus.

Influence of the profile variety on tool costs

Costs for:
- Orange: ProFix-Plus tool body
- Yellow: ProFix-Plus knife set
- Blue: Profile cutterhead
- Light blue: Throwaway profile knife set

Last but not least, we must consider the environment. Throwaway tool systems with no provision for re-sharpening use about seven times as much high-quality cutting material as the Profix-Plus.

And if a new tool body is purchased each time, there is a greater consumption of steel or aluminum.

16 throwaway knife sets ($Z \cdot 4$) = 3.6 kg

1 ProFix-Plus knife set ($Z \cdot 4$) = 0.54 kg
We shape the future ...

... working with you, offering effective support when it comes to selecting and running the correct tools and finding the best solutions for high-quality production processes. We will advise and assist you to meet your customers' needs successfully and profitably.

Our tooling systems – such as ProFix-Plus – are of outstanding quality, and supported by the professional Leitz Service network – collecting, re-sharpening and delivering your tools from a service centre near you. When our products leave our factories, we never leave them to fend for themselves.

Our experience, technical expertise and research & development facilities are the foundations of the Leitz service, from product/process analysis, tool management, tool rationalisation, to complete solutions.

Ask how the technical & economic advantages of ProFix-Plus can be used, and reap the benefits of our service and tool process management. We will look closely at the opportunities for potential cost savings that lie within your production structures to meet your corporate objectives, and estimate the savings from investing in ProFix-Plus.

We look forward to accepting your challenge!