



### Piesslinger GmbH, Austria

## Customized manufacturing solutions for machining of aluminium parts

When 14 years ago the Austrian tradition company Piesslinger first engaged in the manufacturing of high-quality aluminium design pieces, the choice fell on a matec machining center because it closely met the job requirement of planners. Today the customized matec centers from Köngen fill an entire production hall.

At Piesslinger the newest horizontal-vertical machining center matec-30 HV is equipped with a CNC swivel head as well as with free from wear linear drives in the X-axis and with torque motors driving the swivel bridge which is optimal for the manufacturing of aluminium.

### Machining centers for fine aluminium surfaces

The scythes and hammermill Piesslinger founded in year 1553 has been owned by the family for eleven generations. For 455 years the competence and experience in machining and surface finishing of metal and aluminium have contributed to the success of the company. Presently there are 420 employees occupied. In Molln aluminium is processed not as „sheer“ material, in fact they manufacture elements which shape our everyday life. Whether for bath, kitchen, furniture, sport articles, entertainment or lighting industries - nowadays the light-weight aluminium is everywhere at home. Many times multiple ideas of designers set the benchmark for the technological innovations of the company Piesslinger.

In some sectors Piesslinger was the one that introduced aluminum. Johann Hieslmayr, the director of the department for aluminium components at Piesslinger GmbH is sure of that. „Some products would not exist on the world market if we had not created the basis to manufacture these products in aluminium.“ Until 1994, Piesslinger performed almost solely non-cutting processes like shaping, stamping or deep-drawing. By and by the lot sizes were declining and the expensive stamping tools turned to be increasingly unprofitable. Cutting was the more economical alternative. For a while Piesslinger had suppliers perform cutting operations. Then, the company decided to invest in metal-cutting manufacturing.

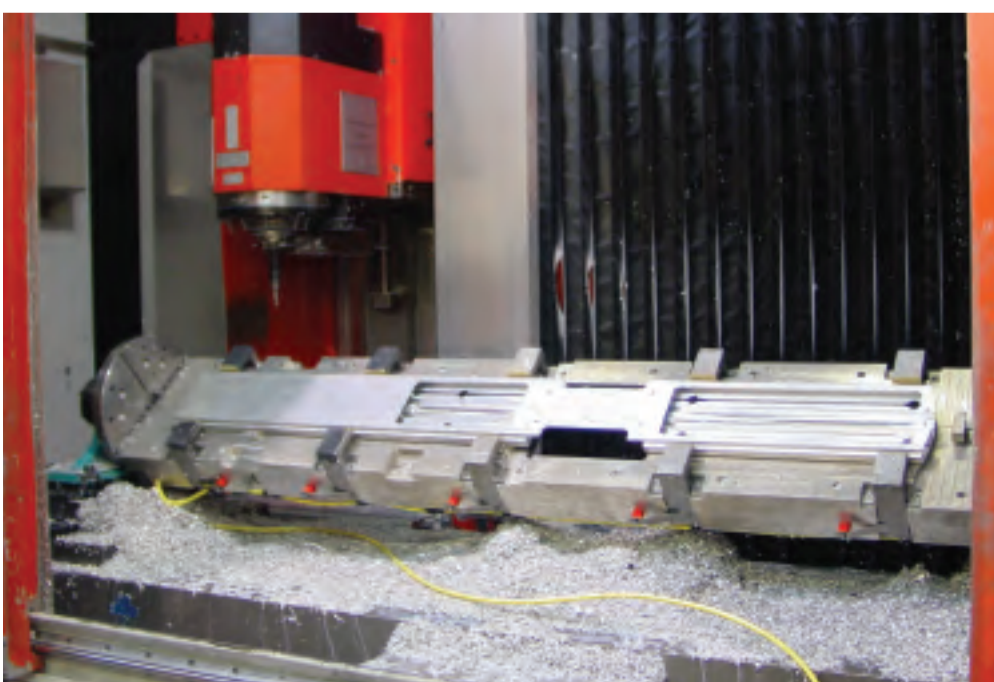
Hieslmayr recalls: “We searched for a machine which corresponds to our individual requirements. The economic and damage-free machining of thin-walled profiles and sheets demands special machining solutions that cannot be realized by a standard machining center. The smallest damage caused by a chip turns a work piece into scrap.” At that time matec offered individual problem-solving solutions for this specific case of operation. Thanks to the ingenious modular system it was possible to realize the task without extensive constructive effort.

### The first matec machine is still running impeccably after 14 years

The first machine delivered to Piesslinger in 1994 carries the serial number 24 at matec and it is still running perfectly up to this very day. Johann Hieslmayr assures: “At that time we decided to purchase “matec” because the machines were so simple in their constructions. That argues for such a machine. Except for the CNC systems there are no highbred and potentially unreliable components. I think that the principle of the matec tool changer with the tool magazine in the traveling column is, from the conceptual point of view, the smartest one which is currently offered on the market”.

The concept has obviously convinced the customer. Since the installation of the first matec machine Piesslinger has ordered on average one new center per year. Today the constantly growing volume of high-quality design parts is produced on 12 matec machining centers, the newer of which are equipped with linear drives. “For the aluminium machining the linear drive is ideal” says Hieslmayr. „The availability of our machines has been increased at about a quantum leap because the drives are extremely fail-safe.“

Where high-speed motor spindles for machining aluminium are concerned, the development has brought an enormous progress – today there are motor spindles in use which provide an increase in cutting capacity, on basis of a 80% duty cycle and 24 hours operation. The main spindles have to meet highest demands. The reason are the extreme vibrations which occur during the machining of aluminium profiles. Johann Hieslmayr comments: “The hollow chamber profiles with their material thinness cannot be clamped tightly. We must clamp the parts in a way that keeps their surfaces protected. Therefore, we try to minimize the clamping to the extreme. This only works with specially developed clamping devices, which are optimized for damage-free contact to the work pieces.“



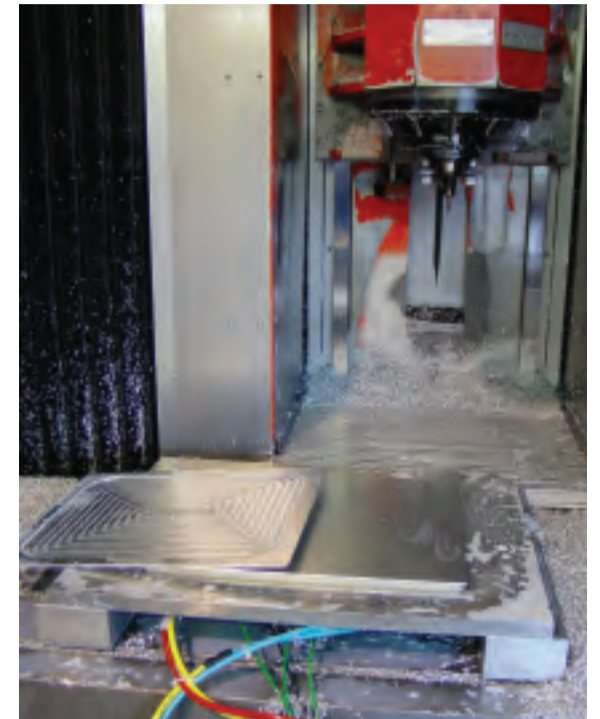
Swiveling device for clamping of extremely damageable hollow chambered rails



Swiveling device for multiple clamping of aluminium design rails

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Sheet metal parts are clamped deformation-free by means of vacuum clamping plates

## Clamping free of vibrations

A profound know-how of the company Piesslinger comprises in finding solutions for clamping with low vibrations and balancing machine feed rate and speed in order to minimize oscillations as far as possible. It comes in useful that matec provides numerous table devices that allow clamping work pieces of different kind. CNC rotary tables with torque drive whether mounted on or integrated in the machine table or numerically controlled swivel tables with a swivel bridge of various lengths – matec provides a solution for the clamping of every work piece, as proved with Piesslinger`s matec machines.

The shift to spindles optimized for aluminium machining lead to a considerable increase in productivity at Piesslinger`s company. The operating time was significantly prolonged. For two years now Piesslinger has been using the motor spindle HSK 63A for certain machining tasks. This spindle has a very rigid construction which absorbs vibrations occurring during profile machining better than other spindles. Johann Hieslmayr: "For high performance boring operations we can now even use heavy-duty boring tools."

## Customized tool changer

Simultaneously matec was working on the further improvement of chip-to-chip time and the availability of the matec tool changer. The sensors were set out of order by the aluminium chips and the plastic bearing bush, which the tool was changed into, wore out very often due to 2 up to 3000 tool changes per day. Therefore matec machine engineers developed a new tool changer for higher demands. This tool changer functions on classic mechanical basis and thus it is practically free from wear.

Johann Hieslmayr: "The strong point of matec lies in the adaptation of the machine concept to our aluminum products in cooperation with us. At present we are pondering on buying the next matec machine that will perform deep borings. It will probably be a matec-30 L, this time with inner coolant supply through spindle (CTS). For this purpose the machine must be equipped with a high pressure pump because our central coolant facility provides only 5 up to 6 bar. We need considerably higher pressure for deep borings. So this machine will be modified according to our needs."



matec CEO Erich Unger: „The new tool changer is designed in the matec way similar to all our tailor-made elements. It can be retrofitted on every existing matec machine with few modifications“

To the right: Johann Hieslmayr: „The new matec tool changer ist constructed in such an ingeniously simple way as to enable us to assembly it by ourseves.“

# Sectors

General suppliers  
Automobile suppliers  
Tool and mould industries  
Tanks and containers industry  
Aluminium machining/Foundry  
Machine and plant engineering  
Packing machines

Electric and electronics industries  
Plastic processing industry  
Medical technology  
Metal-working industry  
Aerospace industry  
Automobile manufacture