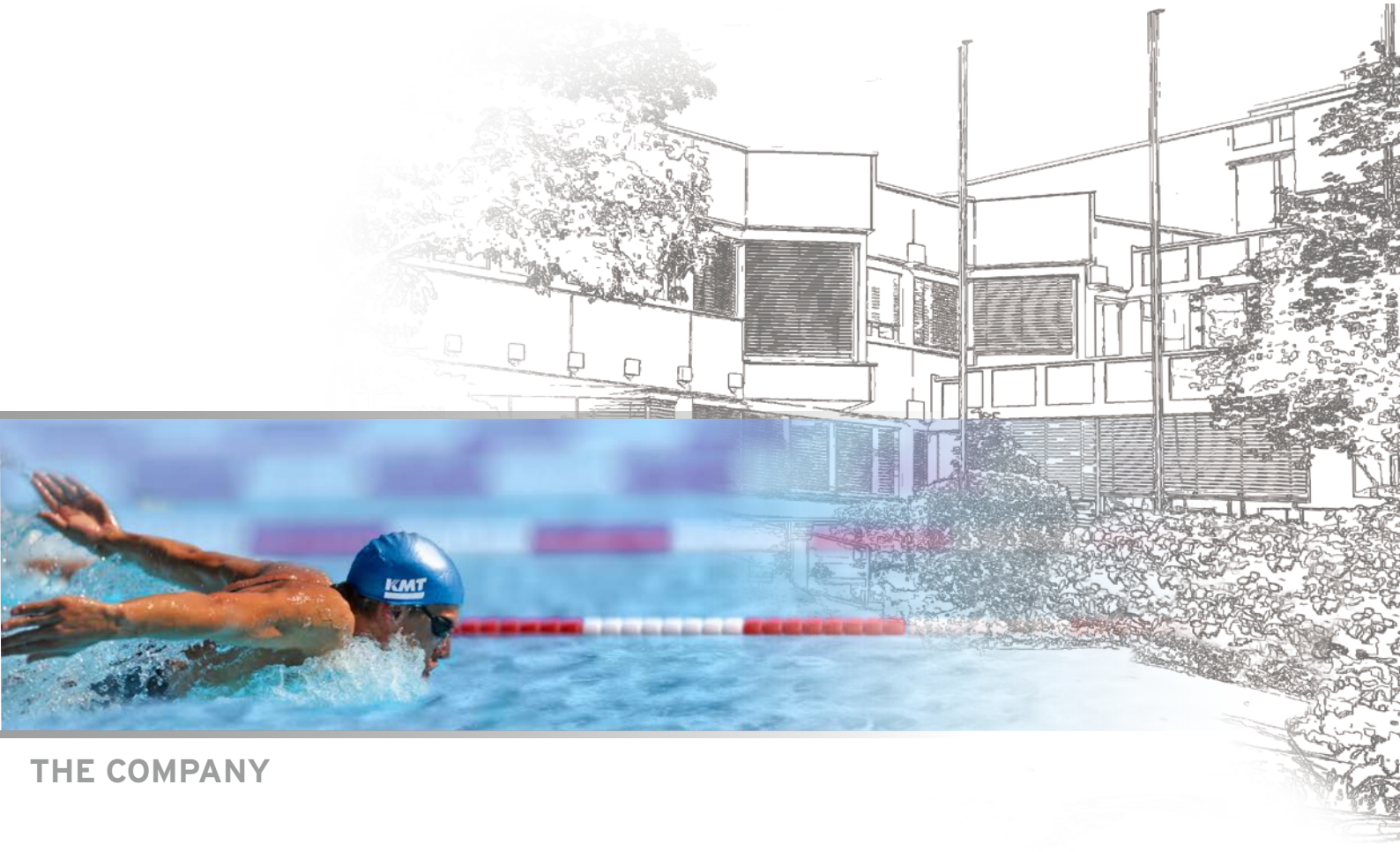
THE HEART OF WATERJET CUTTING



THE COMPANY

KMT Waterjet Systems – The Heart of Waterjet Cutting

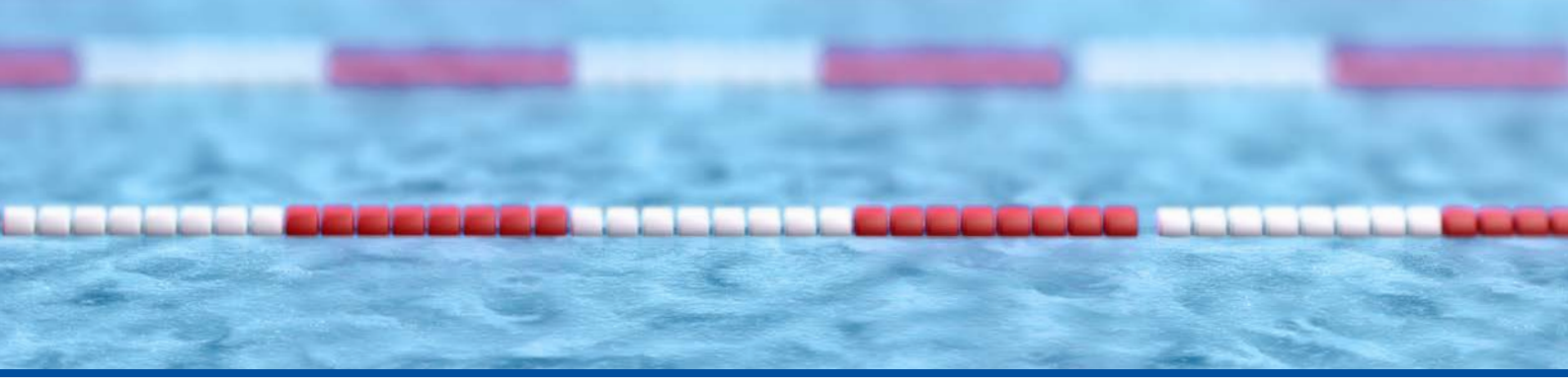
In the early 1970's, the technology of cutting material with water came up. Right from the start, KMT Waterjet Systems has been deeply involved: In 1971, we developed the first waterjet cutting machine for commercial use. Since those early days, the waterjet cutting technology has taken big steps to become a valuable addition and alternative to conventional cutting methods.

When it comes to advancing the technology, KMT Waterjet Systems has always played a big role, and thanks to our consistent and innovative product development, we have been among the technology leaders in the industry for over 40 years now. During this time, we have continuously expanded our sales and service network. Therefore, we are able to offer our customers qualified support by many local offices all over the world.

Our products are well-known for reliability, sophisticated design and ease of maintenance – qualities which our engineers have in mind right from the first draft for a new product. Thus, you can be sure that KMT technology always fulfills the highest quality standards. In our portfolio, we offer you solutions for all kinds of applications: From entry level systems for occasional cutting needs to high-end technology for reliable high-capacity production in multi-shift operation.

The experience gained over the years of course is a big benefit when it comes to continuously improving cutting machines and developing further innovative products. Therefore, the KMT experts have become sought-after advisers for production planning. They can find solutions for all kinds of cutting tasks bringing in the company's know-how concerning waterjet cutting.

- Trained and certified technicians
- Worldwide sales and support network
- State-of-the-art research and development center
- ISO 9001:2000 Certification, PED Approval and TSSA Certification
- CSA and CE marked
- Highest quality products made using the most advanced processes
- A focus on advancement of our customers



KMT Waterjet Systems assists its customers all over the world with competent advice, support and services in all matters concerning waterjet cutting - irrespective of whether you purchased your unit from us or elsewhere. We are always there for you with 24/7 customer service!

Within reach at any time

Our 24 Hour Service Hotline guarantees that one of our service employee is there for you around the clock and at any day of the year. Thus, you are saving time and money because technical questions can quickly be discussed over the phone.

Service around the corner

In case you should need direct help, our service engineers can be at your site very quickly: Certainly, one of our many service locations is located near you. Therefore, downtimes of your production can be minimized.

Optimal availability of spare parts

In our central warehouse in Bad Nauheim, Germany, we permanently have a large amount of immediately available spare and wear parts in stock. And if you need your parts really quick, ask our satellite offices for their stock of fast-moving items. In this way, you will receive your order within 24 hours or even faster.

Clear classification

Due to the precise classification of our products into the categories consumables, spare parts and wear parts, you gain a reliable overview granting you transparency concerning item procurement and control concerning your operation costs.

Qualified customers

When purchasing a KMT high pressure pump, a technical pump training is included in the purchasing price. In this way, your employees are trained to become qualified machine operators and are able to carry out all repairs which are necessary due to wear by themselves.

Waterjet cutting – the technology of possibilities

The technology of cutting with a waterjet – be it pure water or abrasive cutting – has been around for about 40 years now. In this time, it has been established in a lot of industries due to its many advantages.

First of all, it demonstrates a great flexibility in the range of materials that can be cut as well as in the thickness of those materials. Especially concerning metals, waterjet cutting has proven itself very feasible because – as a cold cutting technology – it avoids thermal stress on the material as well as material hardening or warping. Moreover, the technology provides burr-free cutting edges along with a generally excellent cutting edge quality, so there often is no need for expensive reworking of the work pieces. Due to these reasons, waterjet cutting meanwhile has become well established as a worthwhile addition or alternative to conventional thermal technologies such as plasma or laser cutting.

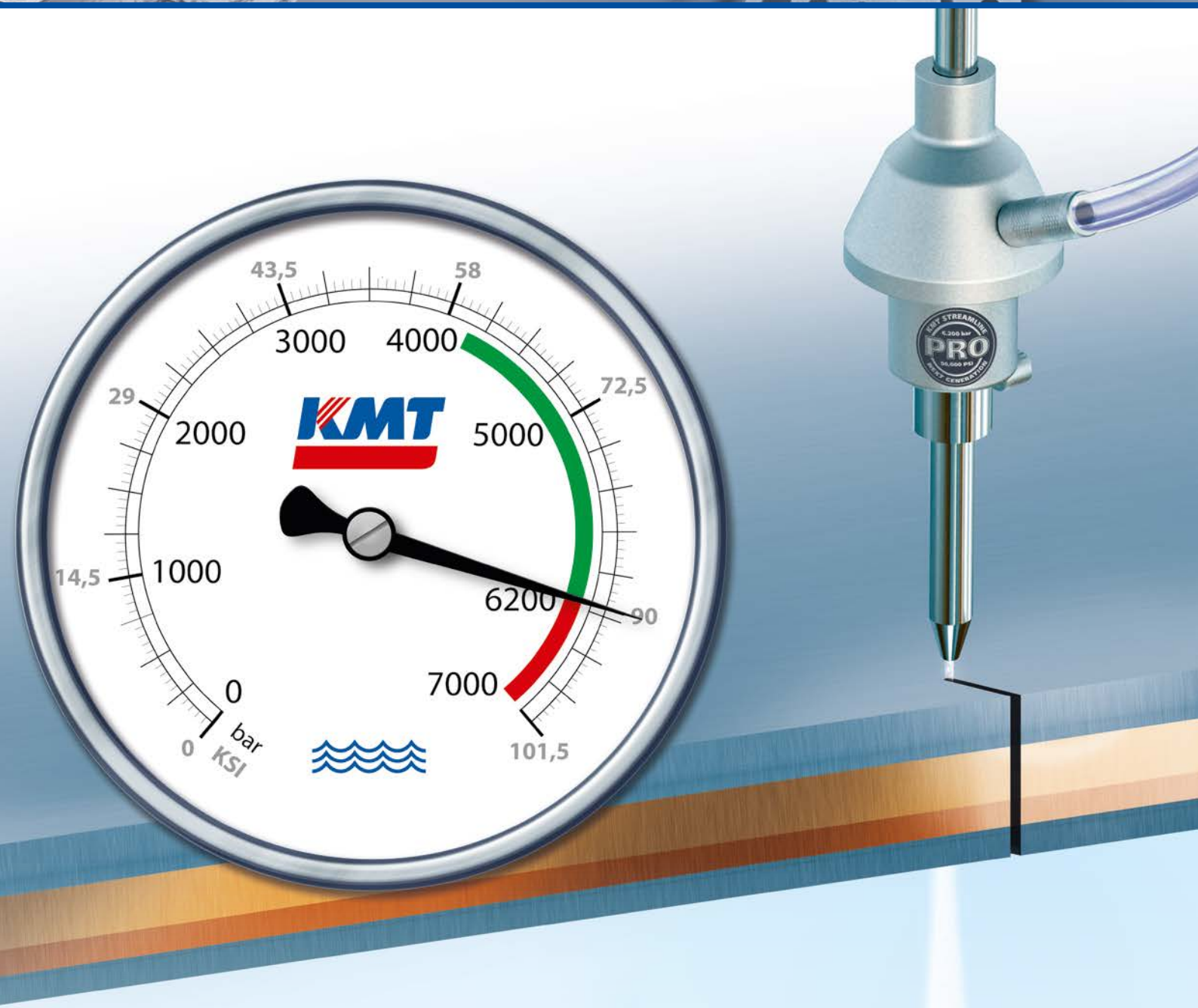
For a long time, a water pressure of approx. 4,000 bar was the industry standard for waterjet cutting. Of course, technical progress also included the waterjet cutting technology, and in the recent past, the pressure range could be extended. A few years ago, KMT introduced its high pressure pump series STREAMLINE PRO, which is fitted to cut at a pressure range of up to 6,200 bar.

This technology leap involved quite a few advantages concerning the process of waterjet cutting. Applying the high pressure technology, the user can both reduce the cutting costs per piece and improve the cutting edge quality. This is possible due to the fact that the cutting speed as well as the abrasive dosage can be increased. So in general, more energy can be released to cut the work piece enabling the waterjet to reach a higher cutting edge quality in a shorter time. Thus, compared to cutting at the standard 4,000 bar, significantly more pieces can be cut in the same time period.

The advantages of the high operating pressure of 6,200 bar are particularly relevant for efficiency where operators need to cut thick and/or very hard materials. The high operating pressure improves conformality as well as the quality of the cut edge compared to traditional 4,000 bar applications.

Advantages of waterjet cutting

- Waterjet cutting allows for high cutting speeds and accuracy
- The waterjet can cut every outline which can be sketched into every material
- Simple programming with standard CAD/CAM systems and a short setup time – due to the low tangential forces, the workpieces do not need to be clamped – enable a very fast implementation from drawing board to cut piece
- The cold cutting method does not affect the structural properties of the material
- Small cutting gaps and optimal nesting keep the material loss very low
- The virtually burr-free cutting edges make reworking unnecessary with most waterjet applications



Advantages of waterjet cutting at 6,200 bar

- Depending on the material and its thickness, cutting with 6,200 bar allows operators to increase the cutting speed by up to 50%. In some applications, the increase is even considerably higher.
- Higher operating pressures improve conformality as well as the quality of the cut edge. In many cases, there is no need for reworking cut edges.
- Cutting with 6,200 bar significantly reduces the consumption of abrasive.
- Thanks to the increased cutting speed, more workpieces can be cut in the same time. This leads lower costs per piece.
- The high working pressure when piercing and cutting the workpiece reduces the delamination for composite material.

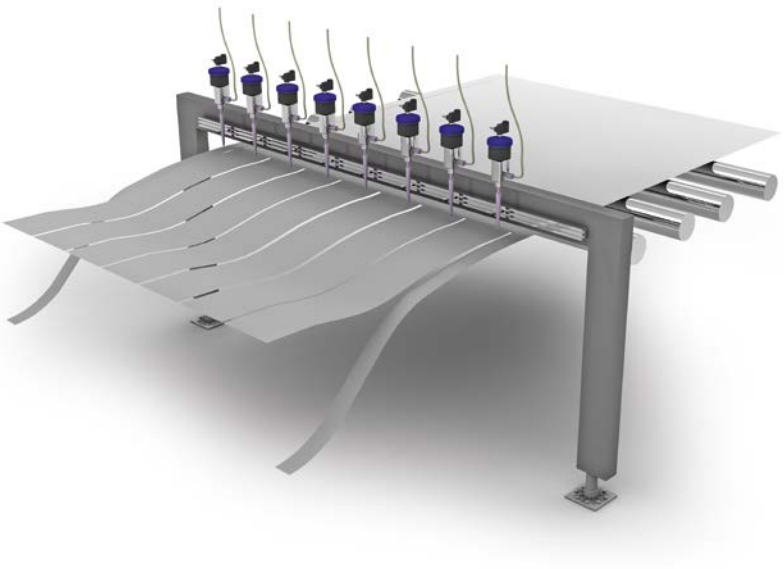
More than just components – System planning with KMT

Due to the universal applicability of the waterjet cutting technology, it is used for a very wide range of cutting applications. Consequently, there is a big variety of available waterjet cutting systems:

- **1D slitter systems for cutting web material**
- **2D cutting tables for cutting sheet material**
- **3D robot applications for complex three-dimensional outlines**
- **Further customized solutions**

One-dimensional cutting

One-dimensional systems are mostly used for cutting web material. The material is placed on a conveyor chain, which carries it at high speed through a portal construction. This construction is equipped with several cutting heads. The space between the cutting heads determines the width of the material stripes. As these kinds of systems are often used in multi-shift operation, a high cutting speed and reliability of the production process are very important.



1D-Online Portal

Two-dimensional cutting

The most frequently used system is the 2D cutting table. For cutting intricate outlines, the cutting head is guided by a central CNC control along the x- and y-axis. Very often, the z-axis (height) is adjustable, too. That is necessary because the cutting head has to be positioned very close to the material to obtain optimal cutting results. This type of system is the ideal solution for the quick production of different workpieces from different sheet materials.

A 5-axes-system enabling the cutting head to tilt via a rotation axis can realize angular and cone-shaped cuts as they are necessary for weld preparation. Also available are systems for cutting holes in pipes or tubes.

The main system features include high cutting speeds and the ability to cut a large number of parts at the same time – very often, these systems are equipped with multiple cutting heads for multiplying the production output. These systems are also adapted for mirrored cuts or reverse cutting. 2D cutting tables are available in various sizes.

Robot applications for three-dimensional cutting

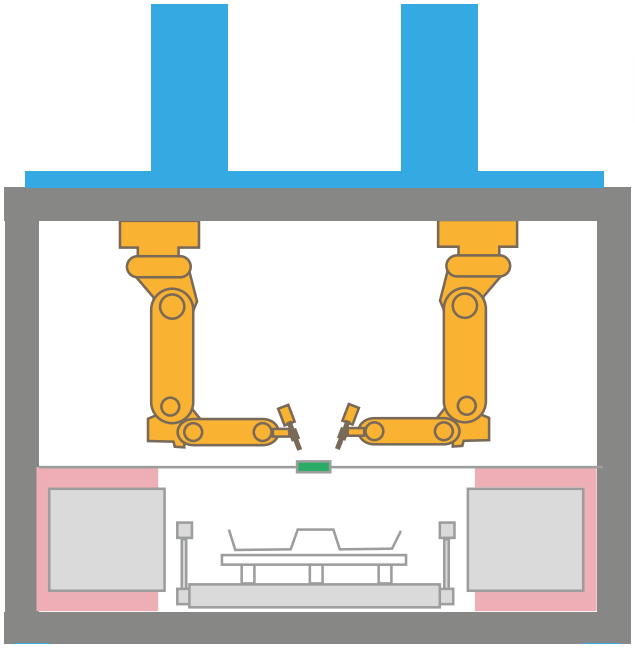
Especially in the automotive and mechanical engineering industry, there are complex requirements which can only be realized by a system for three-dimensional cutting. For these kinds of applications, the cutting head is installed on a robot arm and run along a three-dimensional workpiece for trimming the material or cutting holes.

Robot systems are often equipped with rotating shuttle tables. These enable the time-saving loading and off-loading of the system while simultaneously cutting workpieces in the cutting box. Typical applications are:

- Abrasive cutting:

  Engine components made in titanium, aluminum and stainless steel; turbine blades, marble and other decorative stone
- Pure water cutting:

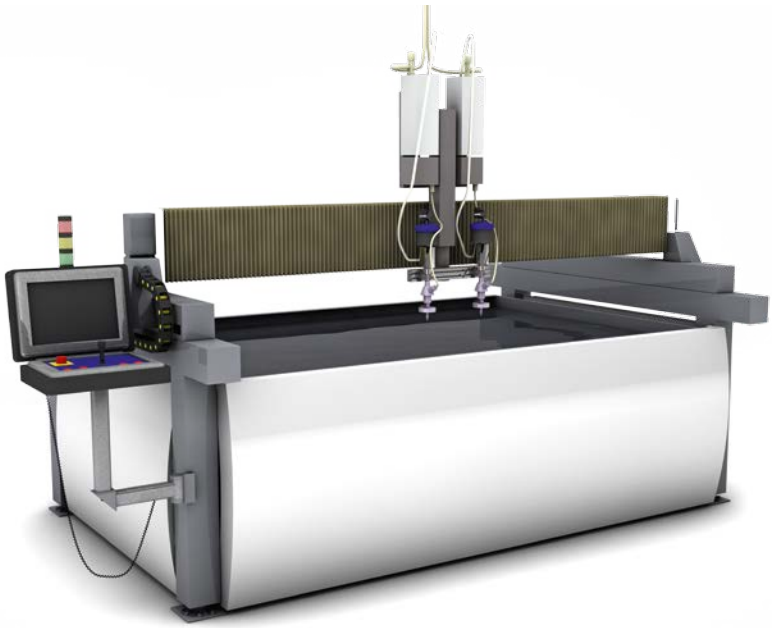
  Components for car interiors such as carpets, door panels, bumpers, dashboards, instrument panels, glove compartments, etc.



3D-Cutting Box

KMT – The Heart of Waterjet Cutting

For over 40 years now, our heart has been beating for waterjet cutting. You can benefit from the experience and expertise: Just let us know about your personal cutting demands. Taking your requirements into account, we will work out a cutting system concept which best fits your needs so that you can run your production efficiently and economically.



2D-Cutting Table

THE HEART OF WATERJET CUTTING

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