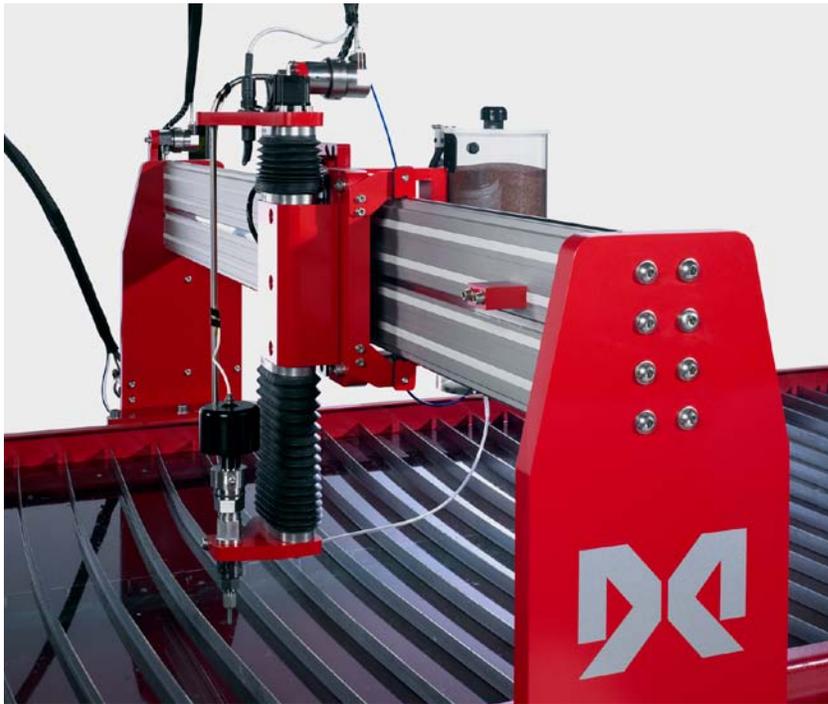


# Drive & Control profile

## Rexroth aluminum structural framing helps OMAX penetrate new markets for waterjet cutting machinery



Rexroth's easy-to-assemble aluminum framing helped OMAX bring the MAXIEM to market quickly.

Easy-to-assemble framing used in a linear motion system cuts machine building time, adds versatility to help OMAX develop an economical waterjet cutting tool

Waterjet cutting technology, once considered a specialized and expensive approach, is now at work cutting nearly everything from stone and metal, to food products

and paper. Precision, combined with high throughput, makes these machines competitive with other traditional cutting methods. Waterjet cutting machine builder

### Challenge

- Develop economical waterjet machine for low-cost markets
- Maintain durability, precision
- Reduce materials cost and assembly time

### Rexroth Solution

- Aluminum structural framing
- DGE Dynamic Linear Element
- Stainless steel shafts
- eLINE compact ball bushings and seal kits

### Benefits

- Cost-effective linear motion in three axes
- Ideal strength-to weight ratio
- Reduction in machining, drilling, assembly and other labor costs
- Anodized aluminum provides durability, clean finish
- Reduced machine building time and materials cost
- Quick assembly with standard hand tools
- Versatility to order framing and create desired lengths for machine variations as needed



Rexroth's Dynamic Linear Elements provide precise linear motion using standard modular components, allowing you to build custom-length linear units in minimum time using simple hand tools.

OMAX Corporation, Inc. (Kent, WA [www.OMAX.com](http://www.OMAX.com)) raised the level of competition recently, thanks to a linear motion and assembly technologies solution from [Rexroth](http://www.boschrexroth-us.com/BRL) (Buchanan, MI [www.boschrexroth-us.com/BRL](http://www.boschrexroth-us.com/BRL)).

Founded by waterjet technology pioneers Dr. John Olsen and Dr. John Cheung, OMAX is a leader in the waterjet cutting industry. The company recently extended its prominence by tackling a new challenge: Meet the demand for a low-cost waterjet cutting machine and make it economical enough for any price-conscious market, including China, where OMAX machinery is being imported.

#### **MAXIEM™ takes shape**

“We identified a significant global need for a line of basic waterjet cutting machines,” says Dr. Olsen, co-founder and vice president of

operations at OMAX. “Through extensive R&D, we developed a new MAXIEM™ line of machines to provide proven technologies in a highly productive, cost-efficient package.” He added that OMAX focused on reducing its time-to-build, material costs, and the need for specialized assembly methods while maintaining machine throughput, accuracy and durability.

Measuring approximately 15-feet long by 7-feet wide, the MAXIEM waterjet is a three-axis machine where a bridge gantry holding the waterjet cutting head travels back and forth across the X-axis, with the cutting head moving side-to-side and up-and-down along the Y- and Z-axis.

To help reach their target price point, OMAX machine designers made the cutting head as light

as possible without sacrificing performance. The challenge was to find an economical linear motion system designed for lighter loads, but strong enough to resist even slight bending to ensure accuracy, and robust enough to withstand friction, vibration and harsh abrasives from the water stream. The components also had to be visually appealing to help give the machine a more attractive, durable and professional appearance.

#### **Rexroth aluminum framing—new approach for a new machine**

Fortunately, OMAX designers were already familiar with products to meet these requirements, but from a different context: [Rexroth's aluminum structural framing](#).

Often used for guarding, assembly stations and machine support in other industries, Rexroth's versatile framing is easy to configure into a linear motion solution where the linear components are built-in directly to the aluminum profiles.

The framing-turned-linear-motion products used in this application include a stout piece of Rexroth extruded aluminum structural framing coupled with the company's [DGE Dynamic Linear Elements](#) to allow the cutting head to move side-to-side for the Y-axis. Four Rexroth eLINE compact ball bushings and seal kits on the Z-axis complete the lineup.

OMAX designers were confident the Rexroth aluminum framing could meet the challenge of this new application. “We were familiar with Rexroth framing products, so we knew they could provide the

strength-to-weight ratio and the durability we needed,” said Dr. Olsen. “Plus we knew we could count on solid customer support from Bosch Rexroth.” He said competitive pricing was another key benefit.

The OMAX design team also knew that Rexroth framing products were simple to use and install—providing reduced assembly and labor costs. The anodized extruded aluminum components required almost

no machining, drilling or re-engineering, and could be assembled quickly using standard hand tools—fitting in nicely with the OMAX lean manufacturing process. OMAX design engineer, Brian Guglielmetti, said the



*Dr. John Olsen is co-founder and vice president of operations at OMAX Corporation ([www.OMAX.com](http://www.OMAX.com)), a Rexroth customer and leading manufacturer of waterjet cutting machinery. He is a key figure in developing waterjet cutting for more than 35 years and continues working to make additional advances in the field. Olsen spoke recently about where this technology is headed—and why manufacturers have only scratched the surface of potential waterjet applications.*

## On the cutting edge with Dr. John Olsen

**A pioneer of waterjet cutting technology shares his views on the opportunities of today—and what the future holds**

### **What are the main challenges facing waterjet machine builders today?**

The number one challenge right now is that potential users don't know they are potential users. People still see waterjet cutting as a specialty technology, which it isn't anymore. It's easier to learn to use a waterjet than almost any other machine. I don't really see any technical barrier to the growth of this technology. The state-of-the-art waterjets now can do precision cuts and produce fine shapes, while maintaining high speed and throughput. The challenge is to convince manufacturers that this can now be a mainstream technology.

### **How did the idea of exporting your machines to China develop?**

It's the biggest market in the world, and virtually all of the buyers there focus primarily on price. Between reducing labor requirements, and some of our proprietary technology features we've developed, we can offer good performance but at a lower cost. Also, our control system is PC-based, and PC prices are quite low now. Chinese machine builders, on the other hand, tend to use standard machine tool controllers, so they don't interface with PCs. So if we build our machine structure in China and bring over the smaller components, we can compete in that market. And there's a lot of potential there, because waterjet applications in China, like everywhere else, are going to grow. Once waterjet cutting tools prove themselves in any application, manufacturers are more likely to see waterjet machines as an attractive option for that application. We've only scratched the surface in adoption of this technology.

### **What challenges arise when attempting to design and produce a lower-cost machine?**

The conventional method in making cutting machines involves a lot of machining labor. The key factor is to design a machine that has good precision but doesn't require a lot of skilled labor to produce it. When you're competing in China, you're competing with machine builders who have as low an overhead and labor cost as anybody.

### **How does Rexroth help in your goal to overcome these challenges?**

The Rexroth extruded aluminum framing is a good example where we can use components that meet our specifications for accuracy and durability but don't require as much labor or cost for machining or assembly. The framing can be standard-ordered from a catalog and assembled in the desired lengths. The components are always available, and they're cost-effective for us. The alternative to Rexroth's framing is much more labor-intensive, and reducing our labor costs helps keep us price-competitive. Plus, Rexroth worked closely with us from the beginning as we tested and refined our design.



The stainless steel shafts fit directly into the T-slots of Rexroth's aluminum structural framing, making them easy to install.



Four Rexroth eLINE compact ball bushings and seal kits on the Z-axis complete the lineup.

versatility of Rexroth framing also helped support OMAX's goals. "Using Rexroth framing makes it easier for us to create different MAXIEM machine variations for cutting larger sizes of material. The framing is a standard product, so it can be ordered from a catalog in custom lengths," he said.

#### **Supporting powerful performance**

The versatile new MAXIEM waterjet is ideally suited for OMAX's target markets. Cutting large sizes of material with speed and precision, it also meets the OMAX goals for quality and performance at a cost-effective price. Rexroth's easy-to-assemble aluminum framing also helped

OMAX bring the MAXIEM to market quickly. For end-users the MAXIEM offers expandability, where new components can quickly be attached to the T-slot framing without machining.

As a result, the MAXIEM has penetrated the Chinese market, thanks in part to the use of Rexroth framing for an innovative new design. This means a wealth of opportunities for OMAX as applications for waterjet cutting continue to grow. Best of all, machines like the OMAX MAXIEM promise to be instrumental in driving more widespread adoption of waterjet cutting technology in the future.

**Rexroth**  
Bosch Group