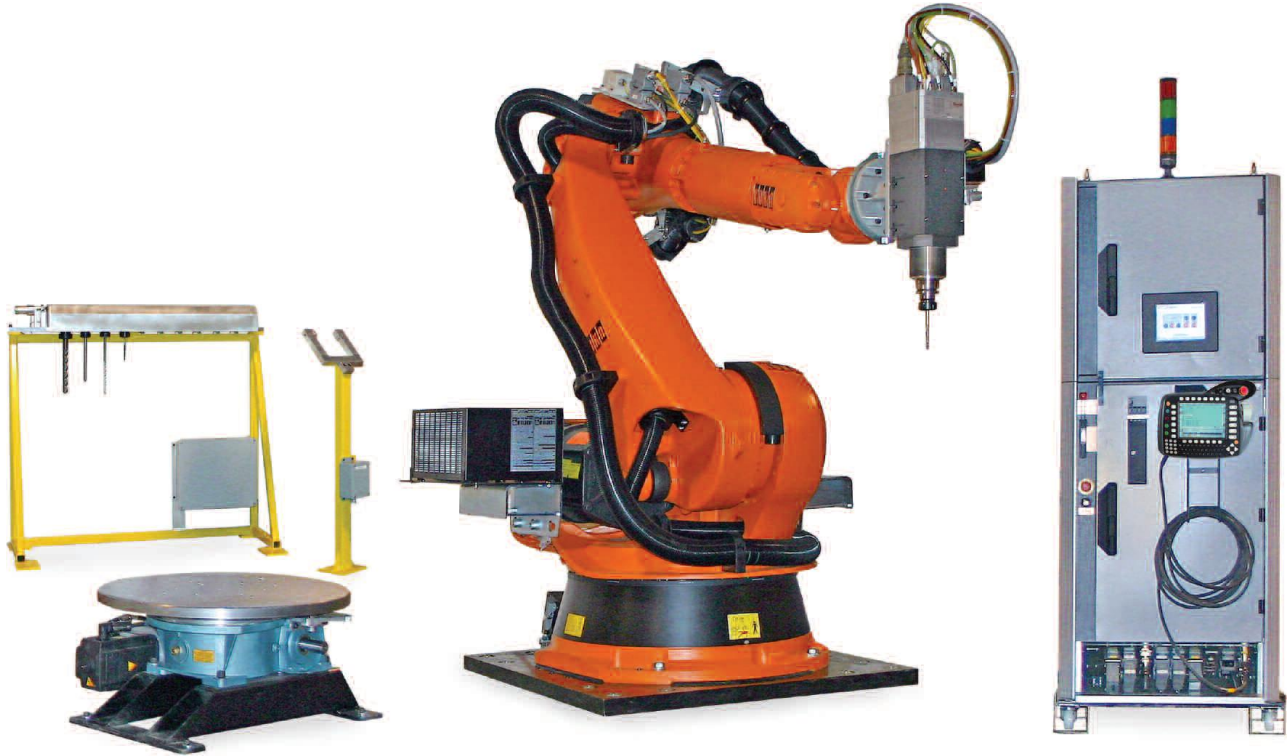
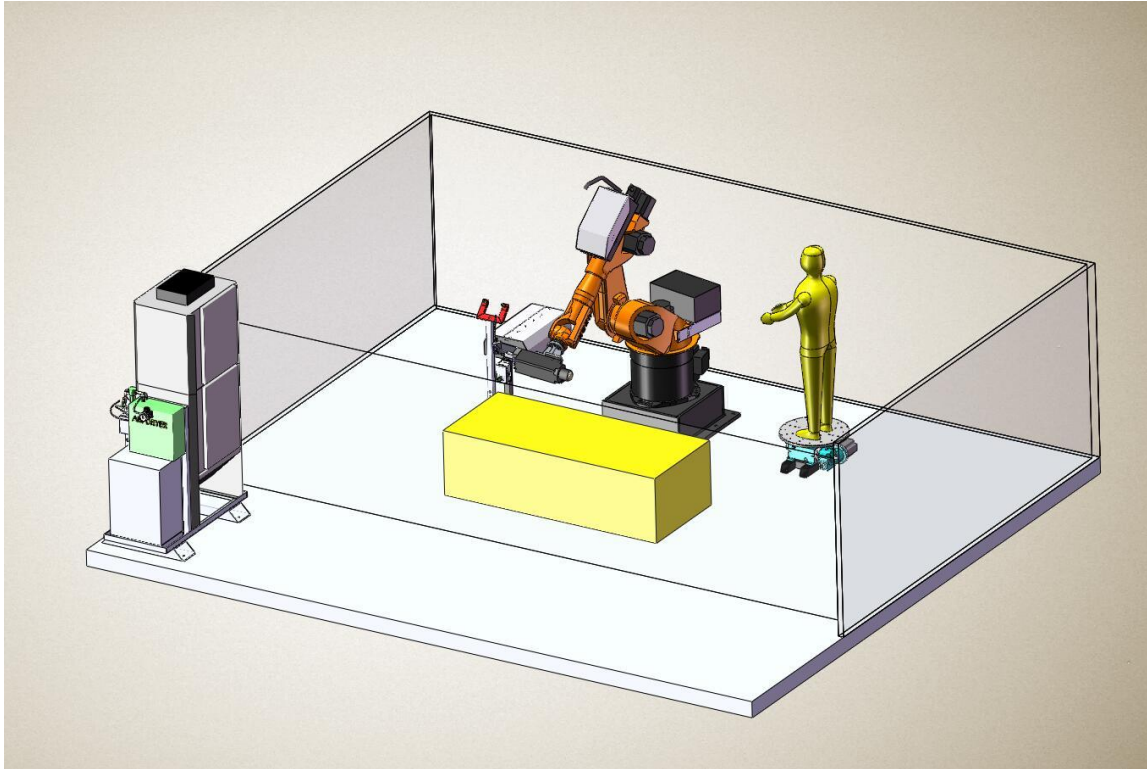


## Viper™ Robotic CNC Foam Sculpting & Machining Cell



## Technical Features and Benefits



The Demand Foam Systems CNC Foam Sculpting & Machining Cell is centered around a KUKA KR100-L80 High Accuracy Industrial Robot.

The Foam Sculpting & Machining Cell utilizes innovative design principles and quality construction to make it simple to use, yet versatile and affordable. The machine is built with the operator in mind, and provides for a quick change over from part to part. Utilization of a laser probe reduces the time necessary to find a new part or fixture, tool lengths and measurement are taken care of with a laser tool setter and the cell is capable of being programmed through a CAM system. All of these things when added up make for a reduced set up and cycle time.

The Kuka robot control is capable of being programmed off line with a CAM system, or programmed using the robot pendant control, or if so desired by teaching the robot.

To achieve a larger machining envelope and additional cutting axis, the addition of a linear floor rail to the KUKA KR100-L80 High Accuracy Industrial Robot is an option.

## Machine Features and Benefits, RMC-100-RTS

All features, benefits and specifications are subject to change.

- **Robot:**

A Kuka KR100L80 HA-2 Robot, one of the premier robots built today, offering high accuracy, repeatability and reliability.

All the main bodies of the principal moving assemblies are made of cast light alloy. This design concept has been optimized by means of CAD and FEM with regard to cost—effective lightweight construction and high torsional and flexural rigidity. As a result, the robot has a high natural frequency and is thus characterized by good dynamic performance with high resistance to vibration.

The joints and gears are virtually free from backlash; all moving parts are covered. All the axes are powered by brushless AC servomotors of plug--in design, which require no maintenance and offer reliable protection against overload. The main axes are lifetime--lubricated, i.e. an oil change is necessary after 20,000 operating hours at the earliest.

These and numerous other design details make the robots fast, reliable and easy to maintain, with minimal maintenance requirements. They occupy very little floor space and can be located very close to the work piece on account of the special structural geometry. Like all KUKA robots, they have an average service life of 10 to 15 years.

Each robot is equipped with a controller. The control and power electronics are integrated in a common cabinet (see separate specification). The controller is compact, user--friendly and easy to service. It conforms to the safety requirements specified in the EU machinery directive and the relevant standards (including EN 775). The connecting cables between the robot and the controller contain all the relevant energy supply and signal lines. The cable connections on the robot are of the plug--in type, as too are the energy and fluid supply lines for the operation of end effectors. These lines are permanently installed inside main axis 1 of the robot and can be routed along the downstream axes to the end effector.

- **14-hp (12.5 kW) direct drive spindle:**

We utilize a 14-hp variable speed 24,000 rpm spindle. The spindle has an HSK 63 taper and is standard with tool changing capabilities. The spindle is built utilizing ceramic bearings and is a permanent grease pack type. Cooling is achieved through closed-loop heat exchanger system.

- **Refrigerated Air Dryer**

With every spindle we provide a non-cycling, refrigerated air dryer and coalescing prefilter to assure the quality of the air that is required by the spindle.

- **Tool changer rack:**

The Cell comes standard with a 10 position covered tool rack. The tool rack can be mounted anywhere within the reach of the robot. Tool change time is approximately 6 seconds. The tool rack has an air activated cover to keep debris from collecting on the tool tapers. Tool change routines are set up in the control of the robot.



- **Laser tool setter / Broken tool detector:**

A laser tool setter comes standard with the RMC-100-RTS and is mounted at one end of the tool changer. The laser tool setter will automatically check the length and diameter of any tool. TCP's (tool center point) are found in less than 30 seconds and routines are set up in the software that allow for several options of use. Information from the laser setter is automatically updated in the control. The laser setter can also be used as a broken tool detector.

- **Integrated Rotary Table**

Fully integrated rotary table that can be used for machining large foam shapes. The rotary table is integrated into the control as a full 7<sup>th</sup> axis which allows for rotation while machining. The rotary table comes with a 24" diameter platter and is capable of holding a 1000 lb load. The rotary table can also be mounted on a linear floor unit. When coupled with the KUKA KR100L80 the system is capable of cutting an 8' cube.

- **Anti collision: (Collision Monitoring)**

Anti collision monitoring is designed to monitor robot motion and motor torque, and if the predefined torque values are exceeded, stop the robot. The values for torque and the interval of time after which the monitoring is to intervene in the event torque values are exceeded are defined by the user. If a torque limit value is exceeded, a **path-maintaining** Emergency Stop takes place.

- **KTL Robot Mastering Set**

The zero adjustment operation, which is necessary for all axes, can be performed with the aid of the electronic probe belonging to a KTL mastering set. This probe provides a particularly fast and simple means of measurement and allows automatic, computer—aided adjustment.



- **Full software integration:**

The KUKA KR100-L80 High Accuracy Industrial Robot is fully programmable offline using Delcam's PowerMILL CAM software. Once your CAD model is imported into the DelCAM software and processed, automatic tool paths are created. The tool paths are easily loaded into the robot using RS-232, Ethernet, or a 3.5" floppy disk. In addition, DelCAM software will provide you with complete collision checking and gouge checking as well. Teach mode is still available if so desired, and can be used in conjunction with the programming software.

- **Safety and interlocks:**

The cell is complete with compliant safety devices. The required safety is included to allow for uninterrupted machining. Perimeter fencing is included, along with a light curtain to protect an open end. If any of the safety items are triggered during automatic mode, the robot will come to a complete stop until things have been reset. Once they have been reset, the robot can return to automatic mode.

## **Optional Equipment**

### **Linear Rail**

KUKA linear units are translational motion units. They can be used to extend a robot's work envelope. This allows applications such as machining of large format parts, or other operations on very large components. Control of the linear unit is integrated as a mathematically coupled axis in the robot controller, dispensing with the need for an additional controller. Linear units are sized for length by the operation



## Standard Machine Features

All features, benefits and specifications are subject to change.

|  |  |
|--|--|
| KUKA KR100L80 HA-3 6-axis robot                    | Laser Tool Setter & Broken Tool Detector                 |
| KRC2 PC based controller                           | Touchscreen Operator Interface station                   |
| KUKA Mastering Tool kit                            | Codebreaker Robot Control Software                       |
| 14 hp - 24,000 rpm Spindle                         | Perimeter steel mesh guarding, three sides ( 20' x 20' ) |
| HSK63 Taper Direct Drive Spindle                   | Safety Light Curtain for 4th side of cell                |
| Rotary Table – 7th axis on KUKA control            | Installation and on-site cell training ( labor only )    |
| Tool Changer – floor mounted with 10 tool capacity | Basic training for 2 at KUKA                             |

### Robot

|                           |                                     |
|---------------------------|-------------------------------------|
| Machining Envelope.....   | 8' x 8' x 8' (with rotary table mm) |
| Max Operating Height..... | 118" (3000 mm)                      |
| Machine Weight.....       | 2,662 lbs (1210 kg)                 |
| Air Required.....         | 4 cfm at 100 psi.                   |
| Power Required.....       | 70 amps, 480VAC, 3 phase            |

### Spindle

|                       |                       |
|-----------------------|-----------------------|
| Taper Size.....       | HSK63 Taper           |
| Spindle Speed.....    | 24,000 rpm            |
| Max Power Rating..... | 14 hp                 |
| Max Torque.....       | 9 ft-lb               |
| Spindle Bearings..... | Steel                 |
| Cooling.....          | Liquid                |
| Lubrication.....      | Permanent Grease Pack |

### Feedrates

|                           |          |
|---------------------------|----------|
| Rapids.....               | 1200 ipm |
| Maximum Cutting rate..... | 800 ipm  |

### Tool Changer

|                            |                       |
|----------------------------|-----------------------|
| Tool Capacity.....         | 10 Tools              |
| Tool Type.....             | HSK63                 |
| Maximum Tool Diameter..... | 4" w/all pockets full |
| Maximum Tool Length.....   | 12"                   |
| Maximum Tool Weight.....   | 8 lbs                 |

### Software Support

Unlimited tech support is included with PowerMill and Codebreaker.

Support via, telephone, fax, email, and internet. KUKA Robotics phone support is available 24 hours a day

### Training

Training for 2 people for four days each at KUKA training center , 3 days of on-site training on your cell by an integrator engineer. Additional training is available. Delcam training consists of 2 three day classes at the integrator training facility in New Berlin WI, for 2 people. The Delcam training comes with training guarantee.