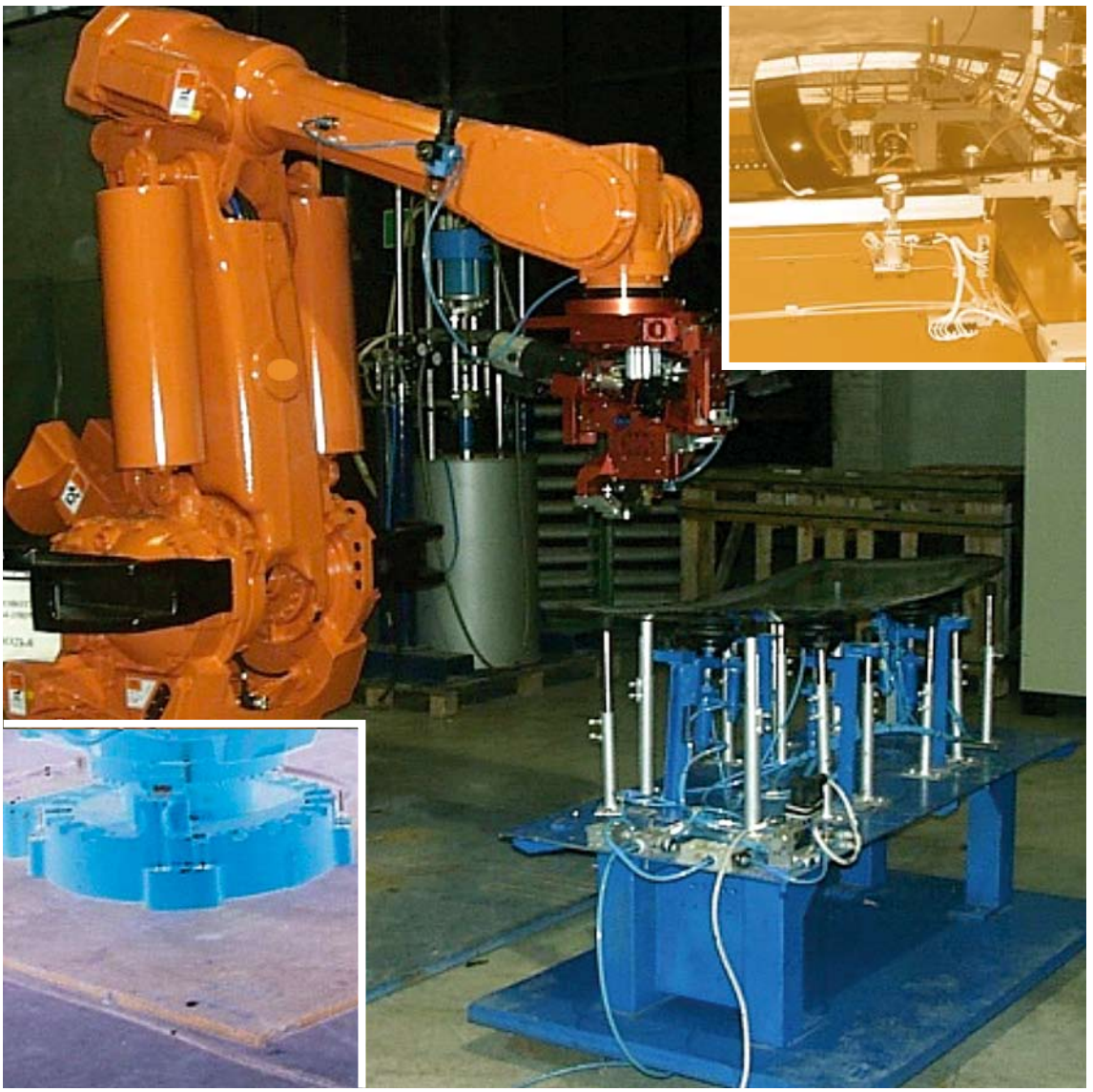
SOLUTIONS FOR THE AUTOMOTIVE GLASS INDUSTRY

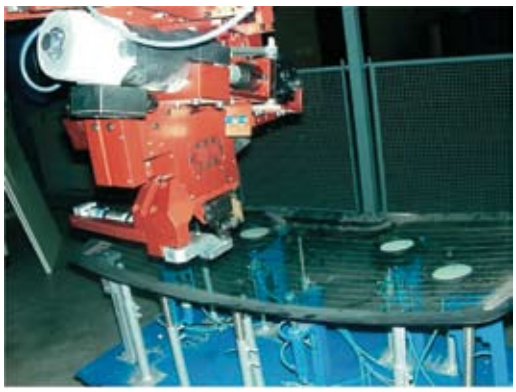
The PUR Direct Glazing



STAR
Engineered Robotics Solutions

THE DIRECT GLAZING

Among the most promising value adding operations a glass maker can provide to the automotive industry, the direct extrusion of profiled ring joints looks primarily as a contribution to the optimization of the automotive manufacturing process.
Fundamentally, the process consists of the application of a polyurethane joint all along the glass windows edge with aesthetical and protective purpose.
At least two other similar application are already employed, these are the fitting of pre-fabricated joints (rings molding) and the encapsulation through injection molding (RIM). Although both the joint fitting and the encapsulation generally offer a wider openness to the structural design of the product, the direct glazing technology is rather oriented to the production cost reduction and to the plant flexibility.
For the customer that, rightfully entitled to make and sell the product, wish to set up a direct glazing production line, STAR offers a very effective and thoroughly tested system with peculiar characteristics and state of the art performances.
A first feature is in the easiest way it can realize consistent and continuous profiles regardless to the complexity of the programmed pattern: the problem of sharp corners and sudden turns is dramatically reduced. A second one, specifically studied for the application on the windshields, consist of the change to vary the cross section of the extruded road in real time during the work: this allows making a joint which has different profiles in the different sides of the glass perimeter.



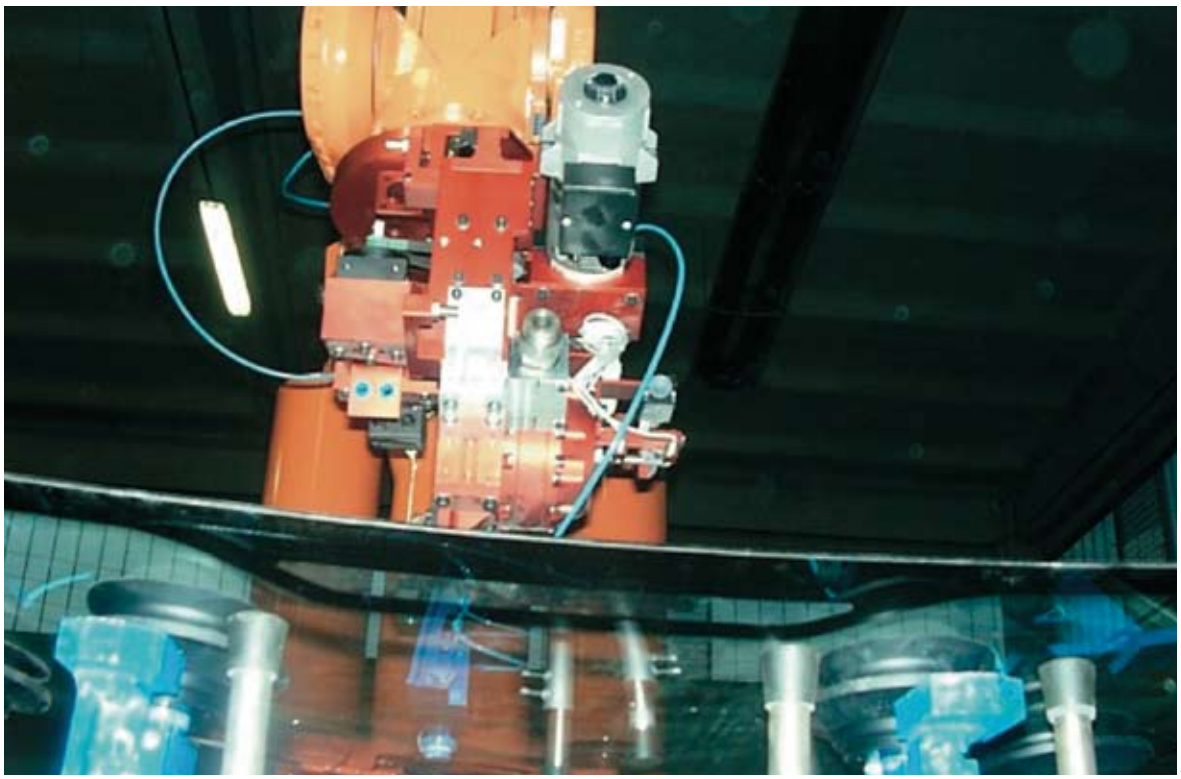
With the standard extrusion systems, glasses have to be stored and cured to allow a subsequently "junction" of the initial and final extruded rods. STAR has developed a new in line system that allows, with the combination of the extrusion features, to realize the junction directly when the polyurethane is steel fluid with no need for intermediate storage and curing.
The system from STAR makes use of programmable industrial robots from the market. The work cell can range from the simple robot equipped with the extrusion system in front a supporting bench to hold the glass to work on, until a fully automated line inclusive of glass loading, unloading, preparation station with cleaner and primer application, extrusion station, automatic ends connection.

EXTRUSION SYSTEM

The extrusion system is composed of the following items:

- *Extrusion Head to be installed onto the Robot;*
- *Polyurethane Feed Pump.*

The extrusion head is one of the most advanced extrusion system actually available into the market and it is a STAR patented technology.
The head is able to change the flow-rate in two different zones of the profile allowing to change the profile during the extrusion, in particular it is possible to make a sealing lip from its maximum size to zero following a programmable law.
Also this system is able to make shape up the one represented in fig. 1 with straight path and curves of a minimum radius of 6 mm.
The extrusion can be also done either following the glass edge (relative) or following the robot co-ordinate (absolute).



THE MACHINE PERFORMANCES ARE THE FOLLOWING:

	M.U.	Max	Min
Profile Width	[mm]	25	0
Profile Height	[mm]	13	0
Profile Area	[mm²]	160	0
Profile Offset Variation (R>200mm) (fig. 2)	[mm]	± 0,35	0
Profile Curve Offset Variation (R>200 mm)	[mm]	± 0,50	0
Profile Waving on 10 mm (fig. 3)	[mm]	± 0,25	0
Speed of Extrusion	[mm/sec]	200	0
Glass Thickness	[mm]	- -	3
Glass Camber	[mm]	175	0

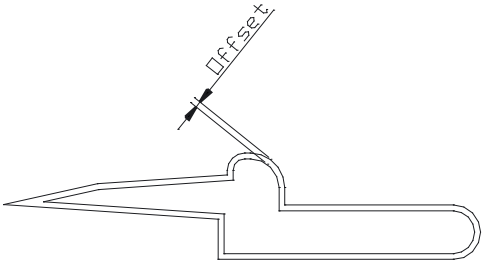


Fig. 2

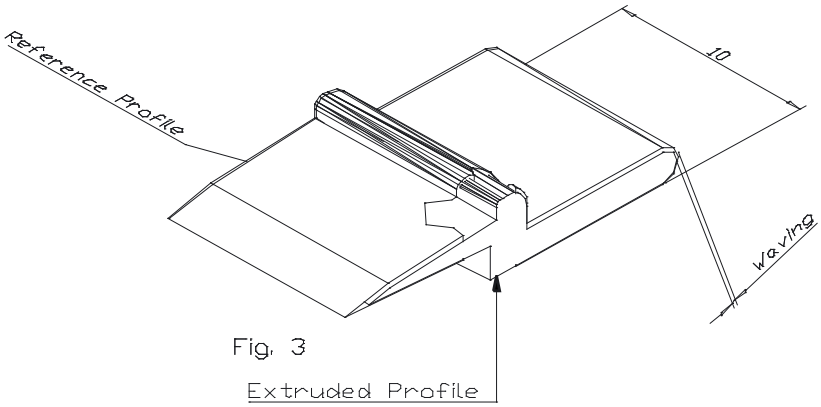


Fig. 3

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For Glass Applications

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