



LEADING IN PRODUCTION EFFICIENCY

Ecopaint Sealing

VEHICLE SEALING – EFFICIENT AND FLEXIBLE





Ecopaint Sealing – CUSTOMER-SPECIFIC SOLUTIONS FOR VEHICLE SEALING

Ecopaint Sealing – Dürr’s product family for the automated sealing and preservation of car bodies.

High viscosity sprayable materials such as PVC plastisols are used for sealing to protect car bodies against corrosion and water ingress. The innovative Dürr **Ecopaint Sealing** system product range is based on **ECO+EFFICIENCY**, and thus improves economic efficiency and guarantees highest quality and environmental compatibility. The **ECO+EFFICIENCY** system covers all dimensions of efficiency, through which Dürr supports its customers in the production process. This reliably reduces unit costs – with the highest quality.

Reduction of unit costs

Automation reduces the scope of manual application. Dürr counts on efficiency and even reduces material consumption through a more accurate and reproducible process control.

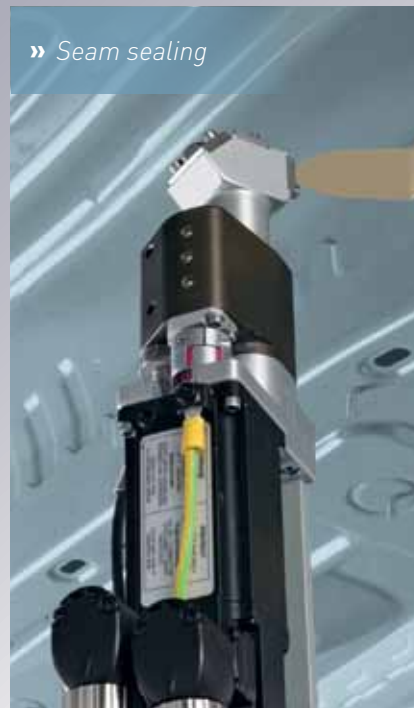
Maximum quality

Dürr application systems guarantee a reproducible process control and thus consistent product quality. Through optimized processes manual touch-ups can be avoided.

Highest environmental compatibility

High quality and automated process controls reduce material consumption and conserve resources.

» Seam sealing



Process efficiency for all areas of application

Dürr offers modularly designed systems for all uses in application on the car body according to specific customer specifications:

1. Seam sealing

The sealing material is applied to overlapping sheet metals on car bodies to avoid gap corrosion due to intruding water.

2. Underbody coating

In order to counteract wear in the underbody area from stone-chipping and similar effects, an underbody sealer is applied. It is mainly applied in wheel wells or rocker panel areas just prior to the primer spray booth.

3. Rocker coating

The surface of vehicle rocker panels is coated to protect against stone-chipping by means of a fully automated specific masking technique. This way, the required coating with high edge definition in the upper area of the rocker panels is achieved.

4. Hem flange applications

Hem flanges on add-on pieces for the car body, such as doors, hoods or tailgates, are sealed with a highly precise Dürr application system in connection with specific nozzle technology. As a result, it is not necessary to open doors or tailgates for the purpose of improved accessibility. The application quality meets requirements for visible welds.

5. Spraying insulants

For cost and flexibility reasons, manually used sound dampening mats are replaced by sprayable material that is applied increasingly by robots. The sound insulating material is applied with a nozzle technology that is especially designed for this purpose.



» *Spraying insulants*

6. Cavity preservation

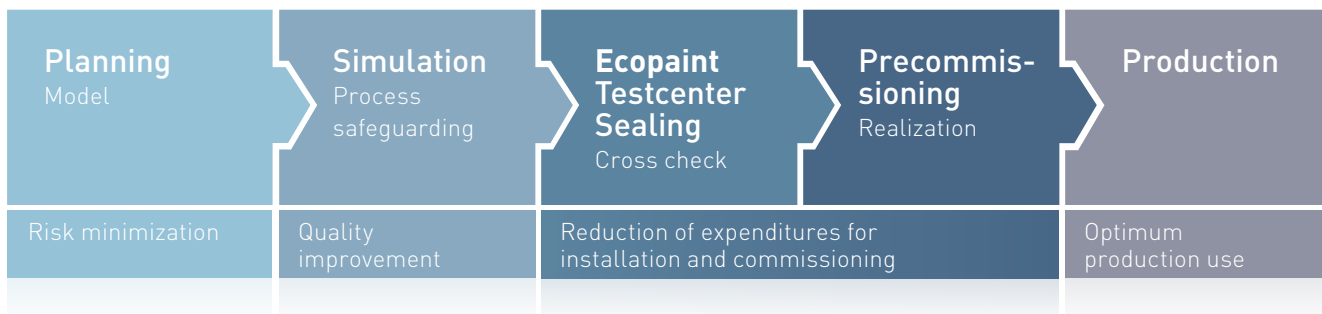
With a wax film, the cavities of the car body are protected against corrosion. For optimum protection with minimum material usage, the wax is applied in corrosion-prone areas by robot-guided lances and injection nozzles.

7. Covering window flanges

Covering window flanges with a strip-off layer of PVC plastisol before spraying prevents paint overspray build up. After painting, the material is removed and the windshield can be glued to the clean electro primed window flange.

ECO+EFFICIENCY From planning to realization

As a supplier of turnkey plants, Dürr is well known for comprehensive process knowledge and high-quality products. More than 1000 robot installations have been carried out successfully in recent years. Automation with robots guarantees a high level of model flexibility and maximum application quality. The application scope and body shape determine the arrangement of the robots. In addition, simulations, application tests, and pre-commissioning procedures before delivery provide the basis for fast production optimization. Dürr is a reliable and experienced partner for all phases of project execution and customer service after production commences. For our customers this means efficient and custom solutions from A to Z.

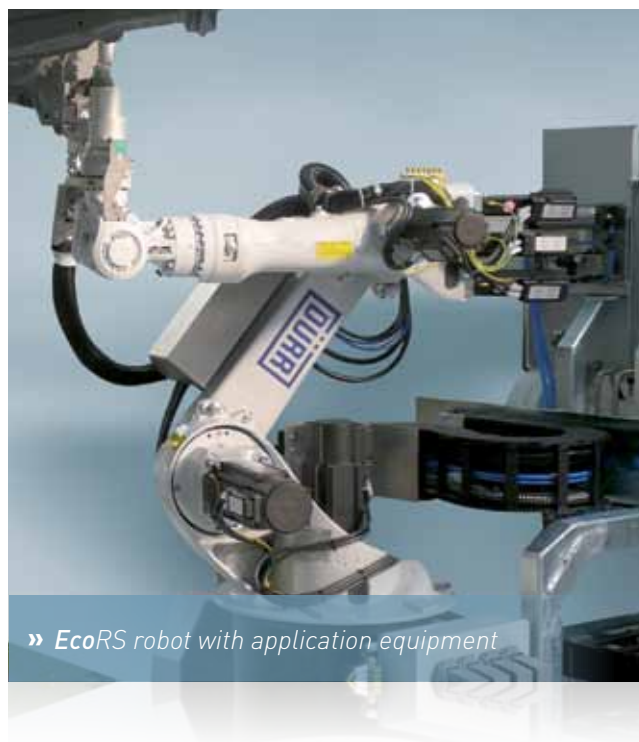


Ecopaint Sealing – ROBOT STATIONS FOR ALL APPLICATION PROCESSES

EcoRS – efficient robotic technology

With the standard **EcoRS** robot, Dürr responds to car manufacturer requirements of homogeneous and economical technologies for the entire sealing area.

Efficient and flexible: The robots, in various sizes and loads, are selected according to job definition and exact requirements. The Dürr **EcoRPC** robot controller integrates movement and process control on one platform. This reduces communication times – which occur with non-integrated systems – and facilitates a homogeneous operating concept for movement and process. A uniform arrangement of the man-machine interface, in both the sealing and painting processes, facilitates the operation and maintenance of robots across the entire paint shop.



» *EcoRS robot with application equipment*

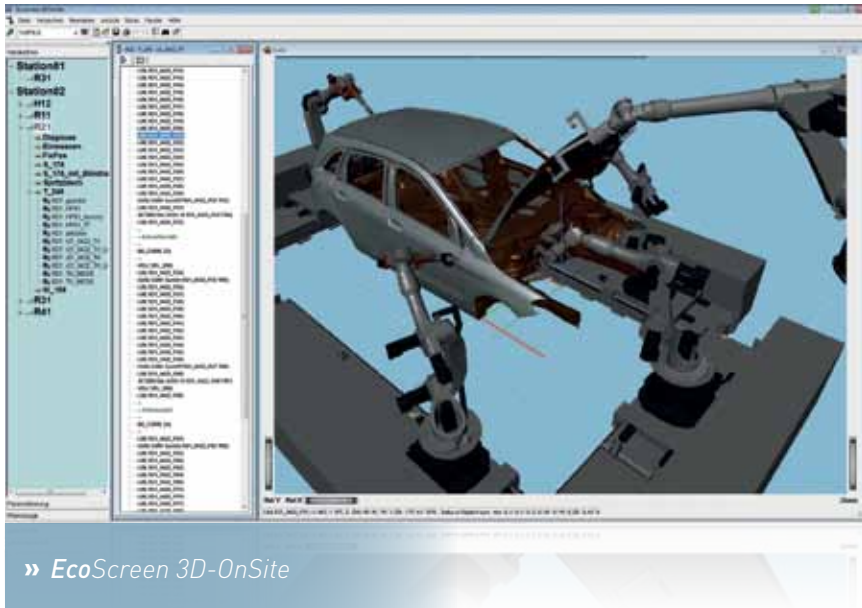
EcoRail – flexible applications with movable robots

For the best possible usage and to increase working space, **EcoRail** extended axes are used. The **EcoRail** is a freely programmable, horizontal movement axis for all sealing applications. The **EcoRail** extended axis is available in various lengths and designs – depending on customer and/or process requirement.



» *EcoRS robot with application equipment on EcoRail extended axis*

	Eco Rail
Axis acceleration	up to 4 m/s ²
Axis speed	up to 1.5 m/s
Service life	up to 25,000 h



EcoScreen 3D-OnSite

EcoScreen 3D-OnSite is a 3D visualization and programming software developed by Dürr which was designed for the production and processing of robot programs as well as the parameterization of corresponding process data. In this way, an optimal installation operation tool is available to the customer directly at the robot cell in production.

The use of EcoScreen 3D-OnSite provides the following advantages:

- » Change of path and process parameters possible online and offline
- » Online parameterization during production allows increased production quality with reduced downtime
- » 3D robot cell and car body model
- » Extensive simulation functions

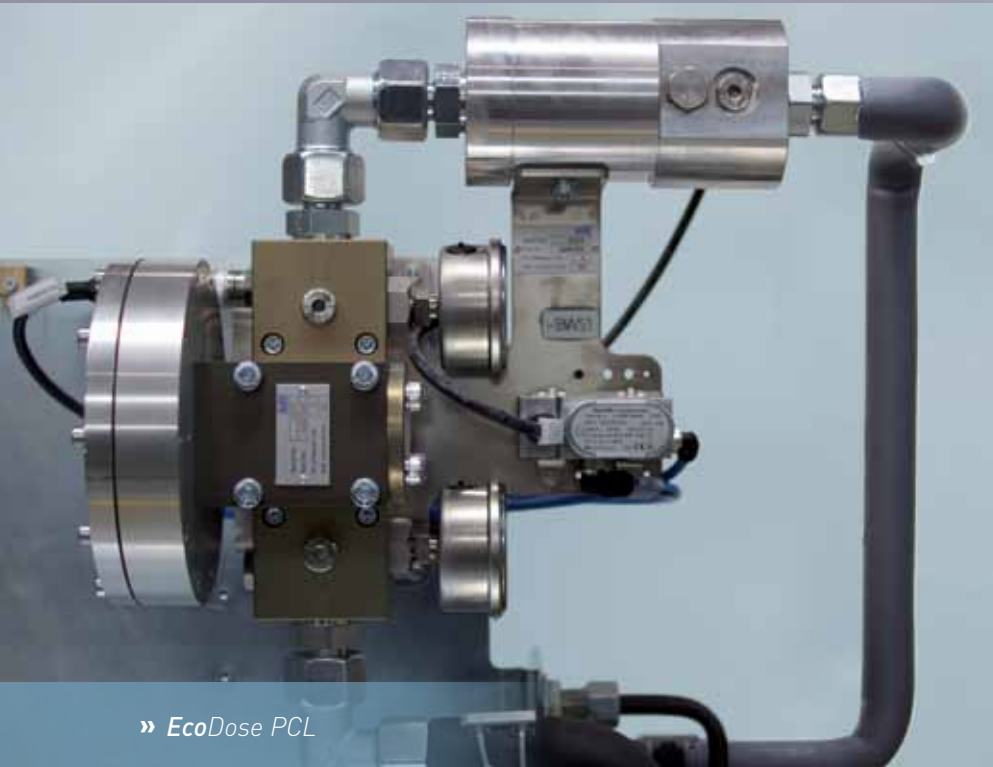
EcoRPC – Dürr’s integrated Robot and Process Controller

EcoRPC – the Dürr controller is used both for sealing and coating processes.

- » Multikinematics/multiprocess capability with up to four movement/process units
- » Integrated PLC system for easy adaptation and diagnosis of process and automation functions
- » Easy maintenance

	EcoRS 16	EcoRS 30L16	EcoRS 60
Load capacity at hand axis	16 kg	16 kg	60 kg
Weight	235 kg	700 kg	665 kg
Arm lengths (arm 1/arm 2)	680/828 mm	1,200/1,545 mm	850/820 mm
Working envelope (mm)	1,611	3,102	2,033
Position repeatability	± 0.05 mm	± 0.07 mm	± 0.06 mm
Payload at the arm	10 kg	35 kg	35 kg

Ecopaint Sealing – DOSING FOR ALL REQUIREMENTS

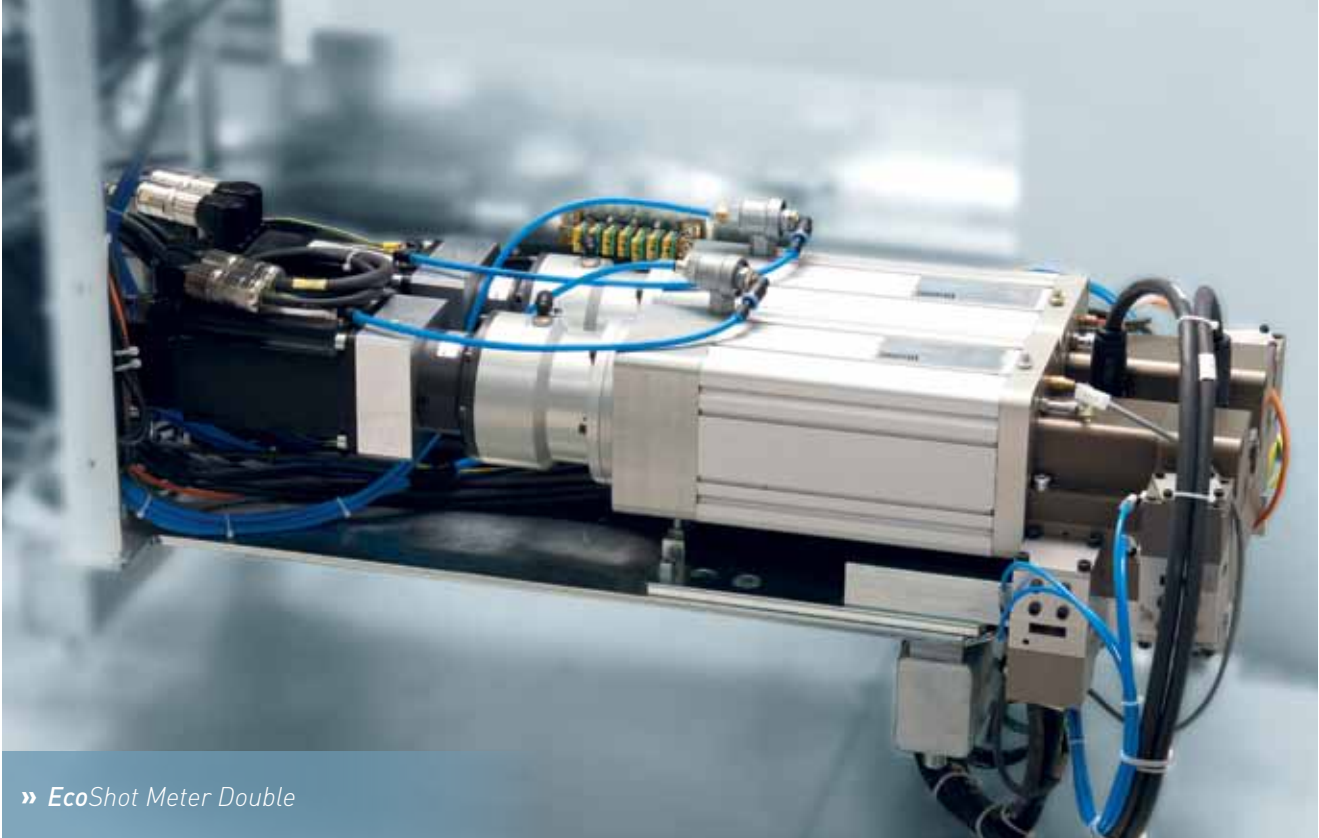


» *EcoDose PCL*

EcoFlow Sealing – perfectly suited dosing for every process

The pressure regulator based dosing system functions in a pressure or volume control mode. All requirements for functional dosing can be flexibly met, with manually adjustable pressure regulators, freely programmable, pressure controlled dosing systems or volume controlled dosing systems with compensation for viscosity changes in the sealing material.

EcoFlow Sealing Mode of operation	EcoDose PM – Pressure controlled application; fixed pressure preselection	EcoDose P – Pressure controlled application; pressure freely programmable	EcoDose PCL – Volume controlled application; freely programmable volume flow
Application pressure	0 to 310 bar	0 to 310 bar	0 to 310 bar
Application tolerance	5 – 8%	5 – 8%	2 – 5%
Material volume flow	to 80 ccm/sec	to 80 ccm/sec	to 80 ccm/sec
Continuous dosing	yes	yes	yes
Examples of application ranges	underbody coating, rocker coating, unterbody sealer	underbody coating, rocker coating, unterbody sealer, masking of window flange	underbody coating, rocker coating, seam sealing from above and below, masking of window flange



» *EcoShot Meter Double*

EcoShot Meter Double – great dynamics in the process

With the **EcoShot Meter Double** electrical double dosing device, material is dosed continuously and extremely precisely. The system is suitable for applications that require great dynamics and high accuracy in the process. Control of the

double dosing device is fully integrated into the **EcoRPC** and facilitates the application of a continuous bead. Dürr's hose expansion compensation software reduces the reaction times of the dosing system.

EcoShot Meter Double Mode of operation	Variant for flow volumes up to 35 ccm/sec	Variant for flow volumes greater than 35 ccm/sec
Application pressure	up to 350 bar	up to 300 bar
Application tolerance	< 1%	< 1%
Material volume flow	3 to 35 ccm/sec continuous dosing	up to 80 ccm/sec continuous dosing
Max. material temperature	Max. 80 °C, heating optional	Max. 80 °C, heating optional
Reaction time	< 150 ms	< 150 ms
Examples of application areas	seam sealing, cosmetic seams, hem flange application	sprayable sound dampening

Ecopaint Sealing – APPLICATORS FOR PERFECT QUALITY



EcoGun Sealing

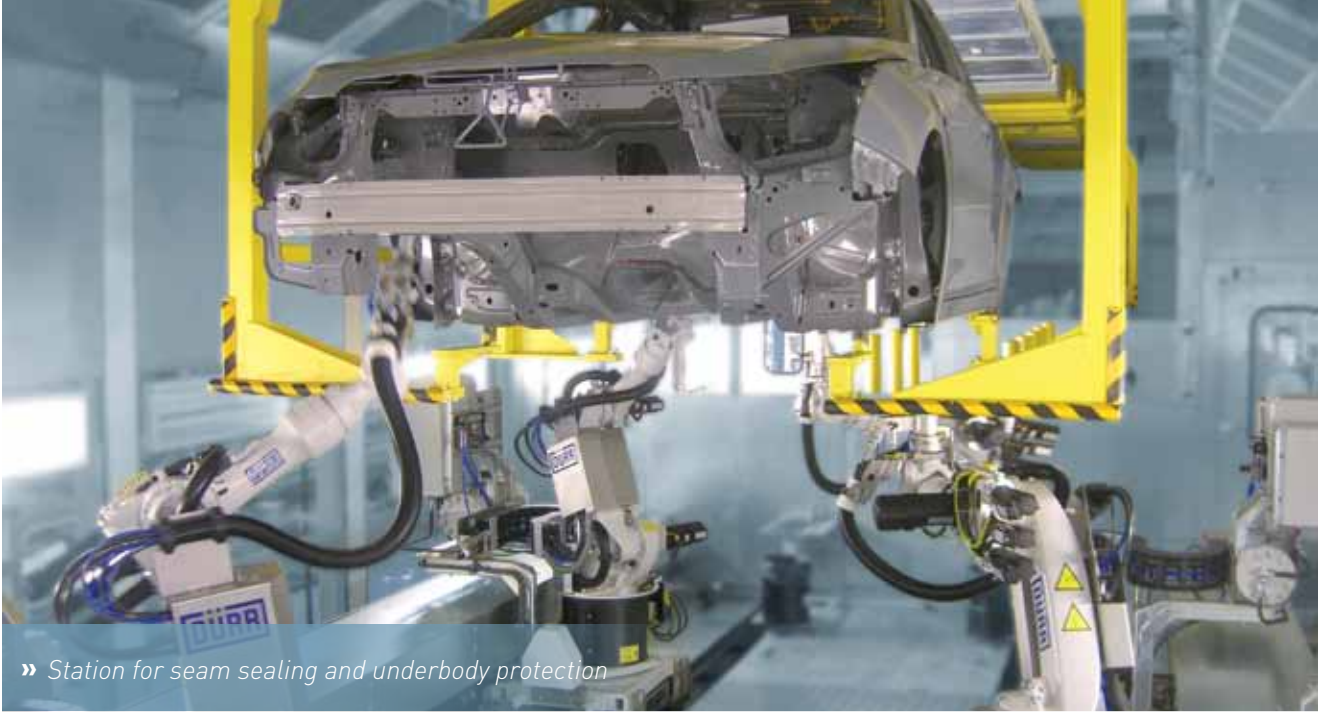
With 3D gun implementation, **EcoGun Sealing** enables the use of up to three nozzles and the selection of three different application angles – 0°, 45° and 90°. To reduce material quantity between needle valve and nozzle, the valves are integrated directly into the nozzle head. This guarantees optimum quality at the seam beginning and seam end. The applicator is available in various lance lengths.



EcoGun Sealing IDS

EcoGun Sealing IDS (IDS = Integrated Dosing System) is a completely newly developed product that integrates the function of a highly dynamic material dosing system and a 3D applicator in one component. Additional dosing components are not required. The integration of the two functions in one component results in a simple system design that has low maintenance requirements. **EcoGun Sealing** is based on the principle of continuous dosing and delivers the highest application quality for all common sealing applications.

	EcoGun Sealing 1D	EcoGun Sealing 3D	EcoGun Sealing IDS	
		For medium flow	For high flow	
PERFORMANCE FEATURES				
Max. operating temperature	50 °C	50 °C	50 °C	50 °C
Max. flow	up to 70 ccm/sec	up to 35 ccm/sec	up to 130 ccm/sec	up to 70 ccm/sec
Max. material pressure	300 bar	300 bar	300 bar	300 bar
Heating	no	optional	optional	optional
Material circulation up to material valves	possible	yes	yes	yes
Integrated sensor system (optional)	pressure, temperature	pressure, temperature	pressure, temperature	pressure, temperature
DIMENSIONS AND WEIGHT				
Cross-section valve block	40 mm x 40 mm	45 mm x 45 mm	55 mm diameter	40 mm x 40 mm
Weight	0.3 kg	Approx. 7.5 kg (at 620 mm length)	Approx. 10.6 kg	7 kg



» Station for seam sealing and underbody protection

EcoGun Sealing MD – masking device

EcoGun Sealing MD is employed in areas where coating with high edge definition is necessary. In automobile production this application is normally used in the rocker panel area. When the EcoGun Sealing MD is used, masking of the rocker panel is not necessary to obtain a high edge definition.



» EcoGun Sealing MD

EcoJet – high quality nozzles with continuous performance

Diverse sealing applications require various nozzles which must live up to their demands. Dürr has developed suitable nozzles based on **ECO EFFICIENCY** for each application, and constantly expands their product range. Nozzles for airless, flat stream, round, swirl, extrusion, LASD and hem flange applications are available. The nozzles are characterized by constant application quality and a long life cycle. For quality assurance, tests on the nozzle test status are carried out. This ensures the reproducibility of the application – even after a nozzle change.



» EcoJet Nozzles

Ecopaint Sealing – PROGRAMMING, CLEANING AND CONDITIONING

EcoGun Sealing – easy handling thanks to its laser programming aid

The laser programming aid for the **EcoGun Sealing** utilizes optical simulation of the material stream and thus supports in the programming of the robot. The laser simulates the representation of the material application points.

The laser programming aid simplifies programming through the following characteristics:

- » Switching on and off the laser head by means of the robot controller conforming to the beginning and end of the seam
- » Seat is identical to nozzle, therefore requiring low installation effort

EcoGun Sealing Cleaner – Clean results through nozzle cleaning

The **EcoGun Sealing Cleaner** cleans the nozzles of the applicator. Air nozzles blow off any material sticking to the application nozzles. The air nozzle position and height are adjustable, giving the **EcoGun Sealing Cleaner** flexibility in various applications.

An accumulation vessel collects the blown off material.

This avoids:

- » Soiling of the car body and the booth
- » Manual cleaning
- » Cycle time losses in the finishing area, since manual cleaning work at the robot is eliminated



EcoTemp und EcoHeat – Conditioning of material for stable application results

Temperature conditioning of the application material guarantees stable application results. Material characteristics are maintained by use of cooling and/or heating. The resulting constant material viscosity in combination with volume controlled dosing system produces the highest quality application.

The following systems are used for the conditioning of materials:

- » **EcoHeat**: Electrical material heating for the temperature range of 32 - 45 °C
- » **EcoTemp**: Water-based temperature conditioning for the temperature range of 20 - 32 °C, or Peltier temperature conditioning for the temperature range of 25 - 38 °C.

Both systems are used for the underbody sealing process, rocker coating, LASD (liquid applied sound deadener), and in seam sealing.



» Customer trial in the **Ecopaint Testcenter Sealing**

Ecopaint Testcenter Sealing

The **Ecopaint Testcenter Sealing** is Dürr's technology center for sealing applications and is available for customer trials, product and process developments and the validation of new products.

The **Ecopaint Testcenter Sealing** is equipped with five, 7-axis sealing robots, basic and high-end dosing systems, and applicators for all process requirements.

Your competitive advantage with Dürr:

- » Reduction of unit costs
- » Process, product and integration expertise from one supplier
- » Maximum quality
- » Highest environmental compatibility
- » Process optimization for every field of application
- » Technological advantage due to innovative products
- » Know-how from planning to realization
- » Worldwide service



LEADING IN PRODUCTION EFFICIENCY

Dürr – Leading in Production Efficiency

Four divisions, one goal: maximum production efficiency for our customers

- » **Paint and Assembly Systems:** Paint shops and final assembly plants for the automotive industry and aerospace construction
- » **Application Technology:** Robot and application technology for applying paint, adhesives and sealants
- » **Measuring and Process Systems:** Balancing technology, cleaning technology and testing, filling and assembly products
- » **Clean Technology Systems:** Exhaust air purification systems, energy efficiency technologies

Subject to change. The information in this brochure contains only general descriptions or performance characteristics which may vary in actual cases. The requested performance parameters shall be binding only if they are explicitly agreed within the sales contract. © Dürr Systems GmbH