

# *Cosmetic sealing in paint shop*

Atlas Copco's SCA product line provides  
high-quality cosmetic sealing solutions

*Atlas Copco*



# Meeting highest demands in paint shop

Sealing and sound dampening applications in paint shop require a high level of quality, reliability and precision. They need to prevent corrosion in the long term and meet increasingly high demands in a car's aesthetic appearance and passenger comfort.

Every production line is unique, but paint shops are made up of four main processes



Underbody application (UBS/UBC)



Interior seam sealing



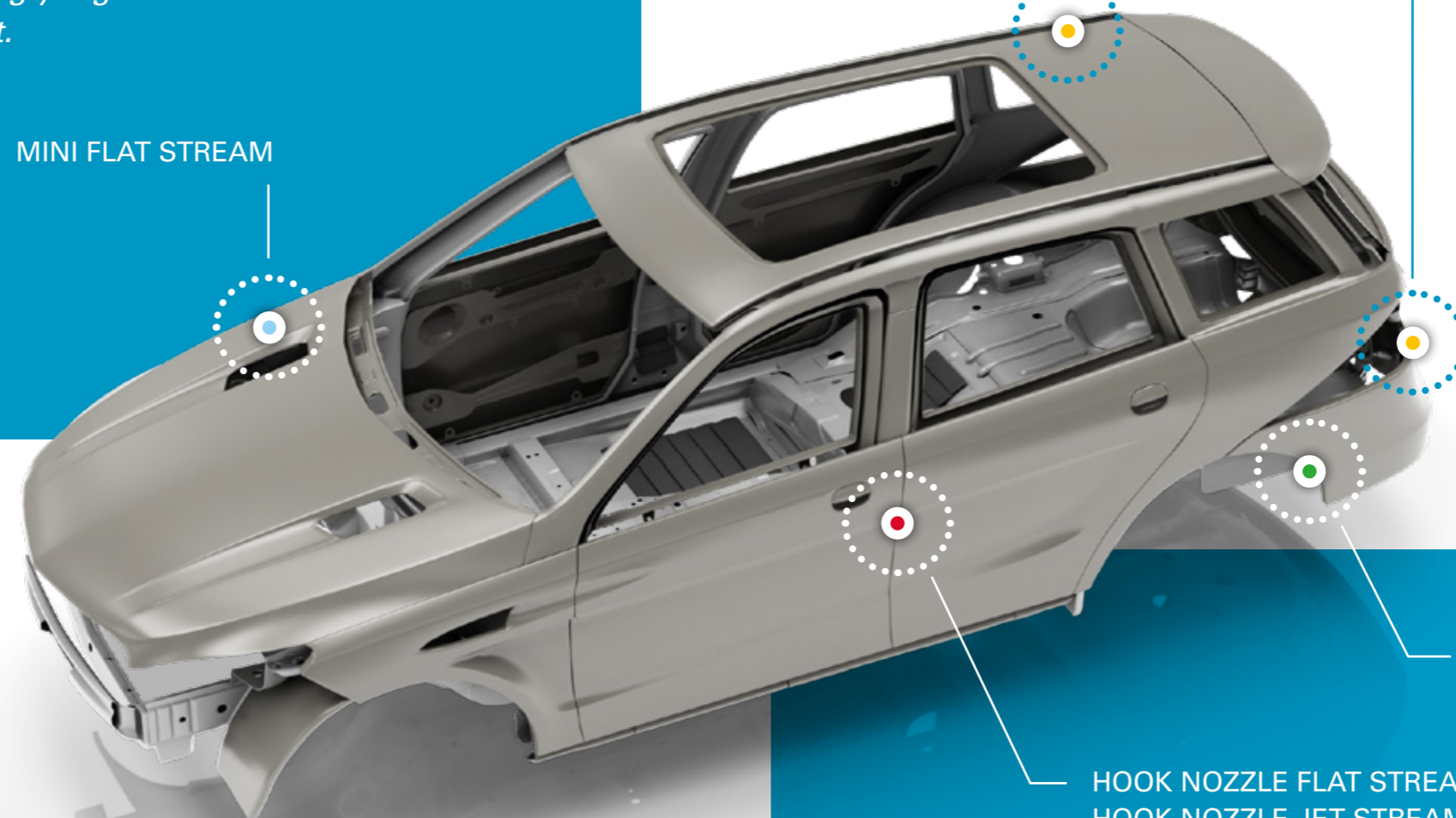
Cosmetic sealing



Sound deadening (LASD)

MINI FLAT STREAM

JET STREAM



EXTRUSION / TRIM EDGE PROTECTION

HOOK NOZZLE FLAT STREAM  
HOOK NOZZLE JET STREAM



- Effective prevention of humidity and corrosion
- Advanced design and increasingly complex geometries of car parts
- Limited accessibility of sealing areas
- High demands in aesthetics and passenger comfort
- Temperature-sensitive materials

## Challenges in cosmetic sealing

A car's design has complex geometries and many surface breaks where tight seals are critical, yet for reasons of aesthetics, they should be invisible to the eye. Areas using cosmetic sealing include e.g. doors, trunks and hoods, rear gutters, roof ditches, and rear lamps. These areas are often difficult to reach with precision, and applying an endless bead can be a challenge.

To fulfill these high demands in function, quality, and aesthetics, cosmetic beads can be applied with different application technologies. Selecting the right application technology depends on the geometry of the car body and customer requirements. With Atlas Copco, car manufacturers have a partner with extensive know-how and a broad range of innovative solutions for cosmetic sealing.

Automated solutions from Atlas Copco for cosmetic sealing



Increase productivity



Enable repeatable high quality



Are easy to use

# Application technologies for cosmetic sealing

At Atlas Copco we make sure that customers get a solution that fits their requirements perfectly while ensuring maximum productivity and quality.

## Mini flat stream

Mini flat stream is a low pressure application with high precision of material flow.

The application distance to the car part is approximately 3 – 5 mm, and the width and slot length of the nozzle determine the bead geometry.

A wide variety of nozzles are available, and they can be adapted to customers' unique specifications.



- Highly precise application, also on varying trim edges
- Smooth surface for excellent aesthetic appearance



Technology	Bead width [mm]	Bead thickness [mm]	Flow [cm <sup>3</sup> /s]	Pressure	Robot speed [mm/s]	Distance to part [mm]	Material	Application temp. [°C]
Mini flat stream	8 – 14	1,5 – 2,5	1,5 – 10	low	100 – 350	3 – 5	PVC	25 – 32

Application parameters for reference use only

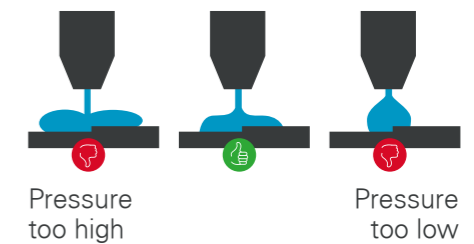


- No orientation of nozzle, easier robot teaching
- High robot speeds
- Highly precise application

## Jet stream

Jet stream is a common streaming technology suitable for high robot speeds and a quality surface finish. The tool's symmetry enables easier robot programming.

Applications can be customized to a variety of operational areas using nozzles of different shapes and openings.



Technology	Bead width [mm]	Bead thickness [mm]	Flow [cm <sup>3</sup> /s]	Pressure	Robot speed [mm/s]	Distance to part [mm]	Material	Application temp. [°C]
Jet stream	4 – 12	1,5 – 2,5	1,5 – 10	high	100 – 350	3 – 8	PVC	25 – 32

Application parameters for reference use only



- Customizable nozzle openings for specified bead shape
- Elastic nozzle that compensates for deviations
- Constant robot speed

## Extrusion

Extrusion at trim edges (trim edge protection) aims to avoid corrosion on a section that is not zinc coated.

The process is used in high-stress areas such as wheel arches or on roof ditches.

Specific nozzles compensate for deviations in robot movements and car part tolerances. They also allow for a constant robot speed with a specific bead shape.



Technology	Bead width [mm]	Bead thickness [mm]	Flow [cm <sup>3</sup> /s]	Pressure	Robot speed [mm/s]	Nozzle orifice	Material	Application temp. [°C]
Extrusion	Depending on customers' specification		1 – 10	low	100 – 150	Shape of application	PVC	25 – 32

Application parameters for reference use only



# Automated application systems

The SCA product line offers complete automated application systems for cosmetic sealing. The selection of components and installing the system must focus on the high precision of the application.

## Field applications

Whether using flat stream, jet stream or extrusion, Atlas Copco makes sure that the application is fully tailored to individual customer processes.

Cosmetic beads are commonly used in several sealing applications, including hem flange, roof ditch, rear gutter, rear lamp or other customer-specific applications.

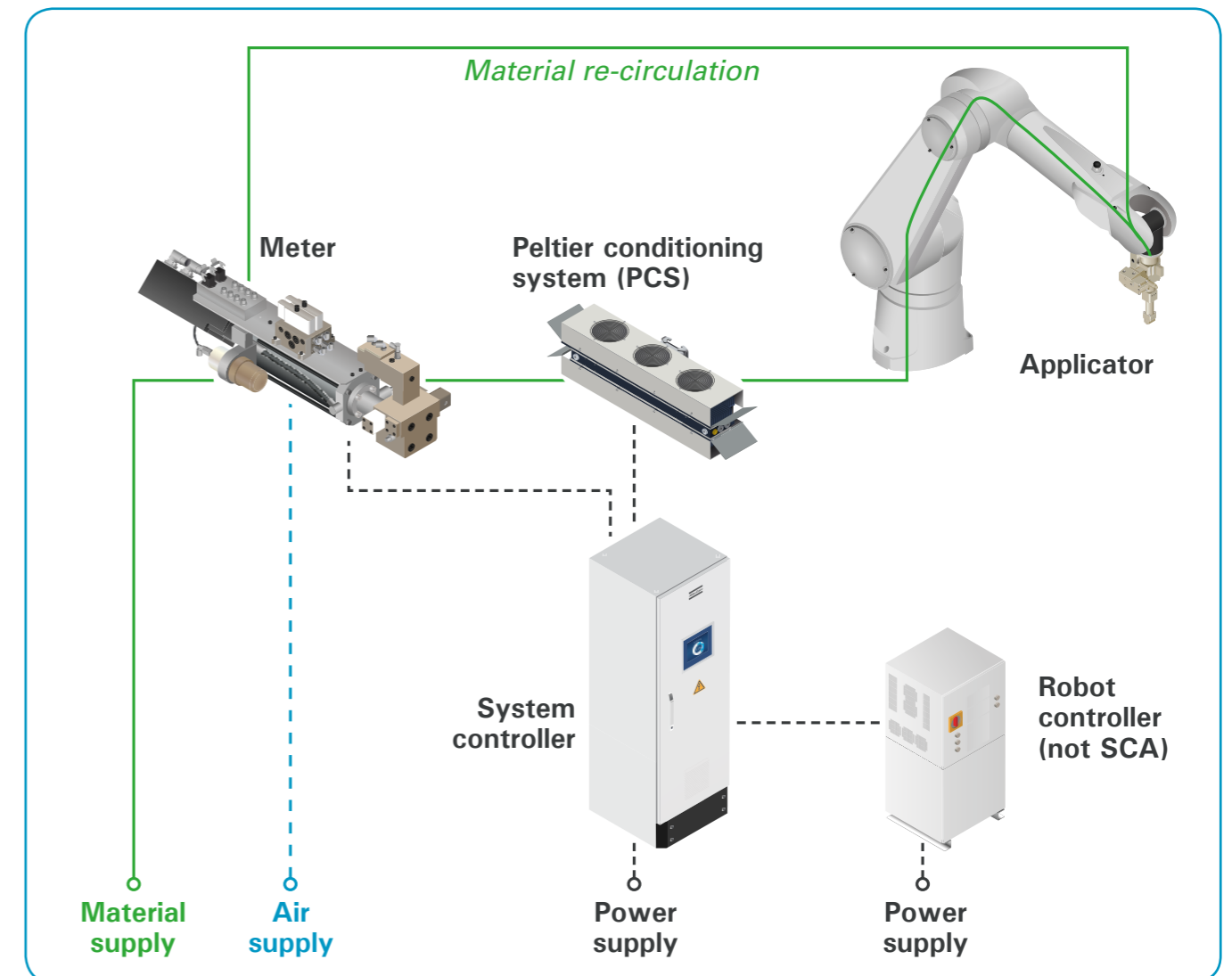
Atlas Copco offers cosmetic sealing expertise in the entire automated application process including process selection, testing and process optimization.

### Nozzle specifications

Hem flange applications for closure parts can require a special nozzle. Customized hook nozzles and L-nozzles are available for both flat stream and jet stream applications.



- Customized nozzle geometry to reach application area
- Highly precise nozzles to insure nozzle exchange without re-work
- Consideration for customers' unique processes and car geometries
- Extensive process know-how and customer support
- In-house testing at Atlas Copco



## System installation

The high quality requirements for the cosmetic sealing process determine the choice of the system and the positioning of components. With the Atlas Copco expertise in system installation, we ensure a high temperature stability and minimal pressure drops, long lifetimes, and easy maintenance.



- Industry-proven components and various options ensure a superior application in every condition

# System components

The components of paint shop application systems are developed for high-performance car manufacturing.

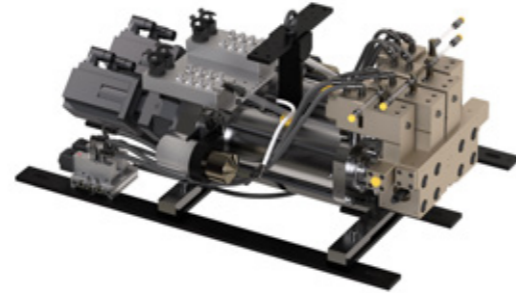


## Application control

The SCA system controller directs all main functions and components of the cosmetic sealing application. For easy operation, an integrated HMI and a central, external HMI are available. The connection from the SCA application controller to the robot controller can be realized with all common industrial field bus systems.

## Metering systems

The selection of the metering unit is dependent on the customers' requirements for flow, volume, and pressure. SCA metering systems are optimized for highly precise applications.



## Conditioning systems

PVC is a commonly used material and its viscosity is highly sensitive to temperature fluctuations. In order to get constant application conditions, a Peltier conditioning system (PCS) can heat or cool the material regardless of ambient temperature. The PCS is fully integrated into the application system and can be operated from the application HMI.



## Applicators

For high-quality applications, customers can choose from a variety of rotatable, multi-nozzle applicators. A re-circulation system to the nozzle is usually integrated into the applicators to stabilize application conditions due to the dynamic viscosity of the materials. In general, different circulation systems are available dependent on system configuration.



## Nozzles

To achieve customer requirements in bead size, a broad range of standard and customized nozzles are available.

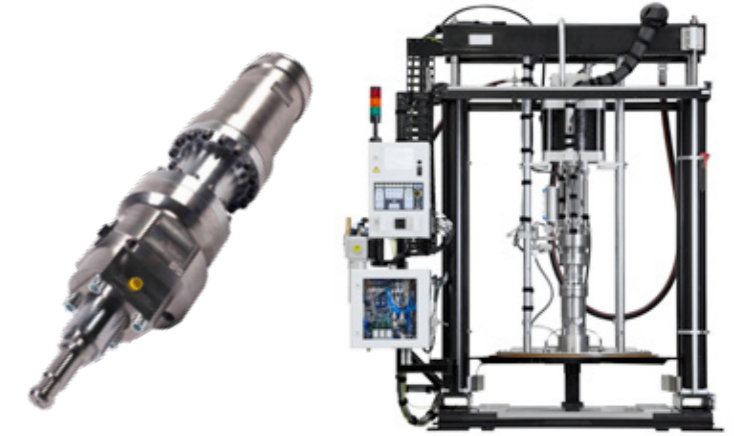


# System options

Depending on the individual customer requirements, SCA system options increase the productivity and quality of the cosmetic sealing process.

## Material supply

The SCA material supply solution for sealing and dampening applications is available as 1000l/300gal barrel version. The utilized displacement pump UP1200 is characterized by a very high volume flow and high pressure. The robust design of the UP1200 enables a long lifetime and easy maintenance. In case of long distances from the material supply to the application cell, the UP1200 is used as booster pump.



## Nozzle cleaning station

The standalone nozzle cleaning station Borster NCS with auto switch-on functionality is Atlas Copco's solution for paint shops to eliminate line stops, rework and cleaning caused by residual PVC material at the nozzle and drips on the car body.

## Tool change station

Paint shop production lines working on a variety of car models need flexible solutions. The SCA tool changing station allows the use of different nozzle shapes for various car designs. The whole nozzle carrier of an applicator can be exchanged automatically. Equipping the nozzle can be optimally aligned to the car's geometry. For different designs, diverse variants are available that can be flexibly adapted to customer requirements.



## Software features

The SCA online tracer is a useful application control tool to satisfy high quality demands in cosmetic sealing. It can be used to precisely analyze processes during an application cycle. It is used for troubleshooting, diagnostics and quality control. Furthermore, valuable software features are automatic pre-pressure control and highly precise volume measurement.

# Sucess story

## Initial situation at OEM

- Production of seven models, each with five variants, in total 1,200 vehicles a day
- Operation of two lines in three shifts
- Cosmetic sealing on closure parts: 100% manual applications as well as a high amount of rework

## Atlas Copco solution

- Development of a fully automated application system for cosmetic sealing on closure parts
- Concept development, process development and validation, nozzle specification
- Testing in validation cell and product line, roll-out for all hang-on parts in the entire production line

## Situation today

- More than 20 Atlas Copco automated application systems implemented for cosmetic sealing and hem flange
- Significantly increased productivity and quality in the entire production
- Manual work limited to finishing and inspection

### Contact us!

Learn more about what Atlas Copco solutions can accomplish in your paint shop:  
[sca.info@atlascopco.com](mailto:sca.info@atlascopco.com)

# How we innovate our customers

*Atlas Copco is synonymous with high quality and efficiency. With operations all over the globe, we have a vital corporate culture that is built on innovation, application knowledge sharing and a strong customer focus.*

Individual processes require individual solutions. In our ten Innovation Centers all around the world, our experienced teams work together with customers and suppliers to develop the best solution for their individual application needs. We strive to be an extension of your innovation department and to offer you the highest value possible.

## We keep your systems running

With over 150 service technicians around the world, we are close by and ready to ensure the customer gets the very most from his Atlas Copco systems, now and for many years to come.



- Reduction of costs and risks associated with production ramp-up
- Process optimization without disrupting series production
- We connect customers, process experts and material suppliers
- Access to Atlas Copco's process and information database
- Close proximity to customers around the world through ten global Innovation Centers
- Process development based on customers' actual, real-life processes





## *Committed to sustainable productivity*

We stand by our responsibilities towards our customers,  
towards the environment and the people around us.  
We make performance stand the test of time.  
This is what we call — Sustainable Productivity.

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