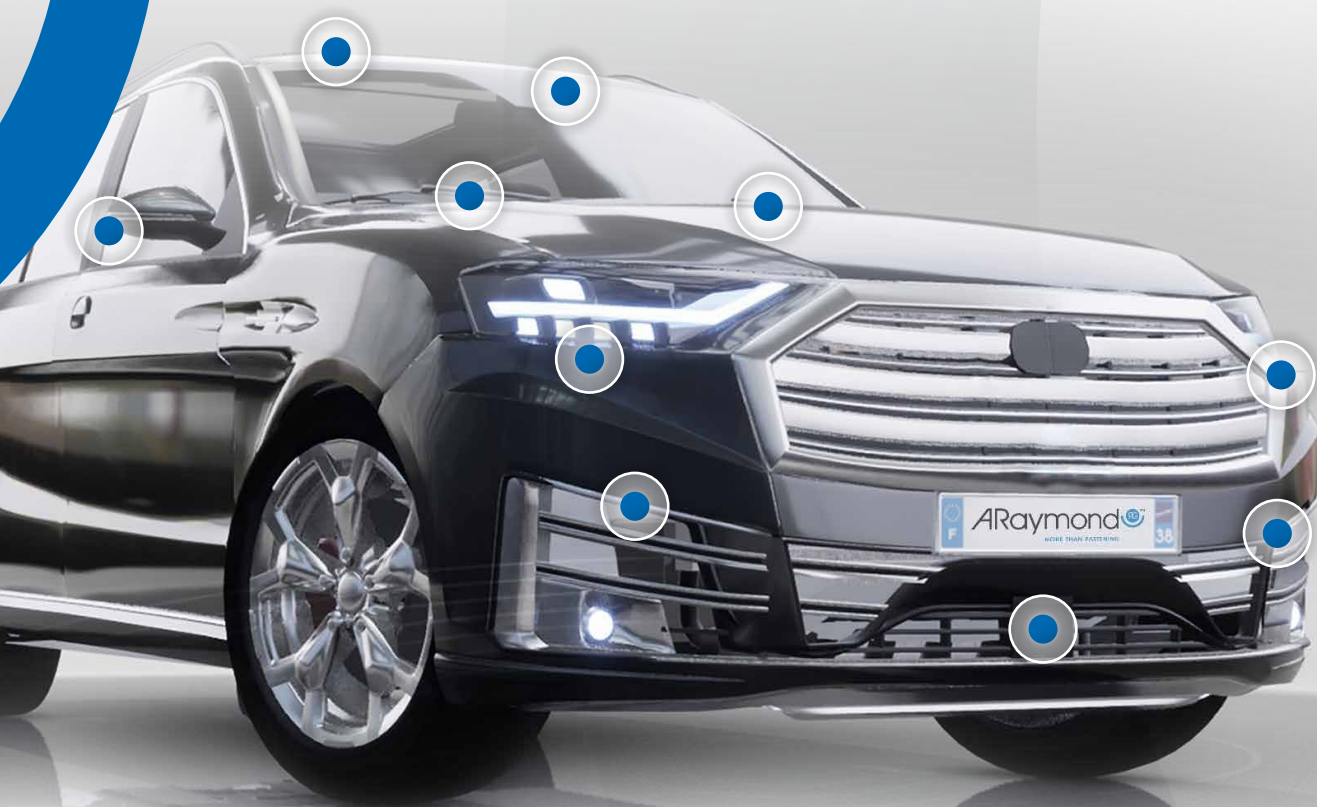


ARaymond®

YOUR PARTNER FOR
CLEANING SYSTEMS



INTERNATIONAL EXPERT IN FASTENING AND ASSEMBLY SOLUTIONS

We partner with our customers to develop fastening, assembly,
and cleaning systems for the complete vehicle life cycle.

Our mission is to increase assembly efficiency and optimize system
performance for our customers worldwide.

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CLEANING SYSTEMS

At ARaymond, we draw from over 30 years of experience designing and producing cleaning system sub-components in house.

We work closely with our customers to come up with value-creating cleaning solutions, whether it is to speed up the assembly time, guarantee efficient fluid usage, or ensure impeccable cleaning of front and rear windshields, lamps, LIDAR, and cameras.



Optimized cleaning results
Efficient water management
Integrated functions

HOW WE WORK

1

CONCEPT & DEVELOPMENT



Understanding
your challenges



Concept development
& testing



CAD analysis
Spray angle analysis

Cross section
investigation



Simulation systems:
In-house Finite
Element Analysis

Computational
Fluid Dynamics

Installation space
verification

ASSEMBLY PROCESS & QUALITY CHECK

We build modular assembly machines in-house



QUALITY

A fully **automatic process**, using cutting-edge technology with assembly process **monitoring** for each assembly phase. Including a **100% spray angle check** with high-definition cameras. A **leakage test** is carried out for the nozzles with non-return valves.



FLEXIBILITY

A flexible and targeted process that allows **easy implementation** of **additional features** or **design adjustments**.



SPEED

The optimized production lead time speeds up the **time to market**.

2

PROTOTYPE & PRE-SERIES



Prototyping

Prototype tests
on real vehicles

3

INDUSTRIALIZATION & PRODUCTION



Injection molding
and tool shop

In-house
engineering
of assembly lines

Serial
production

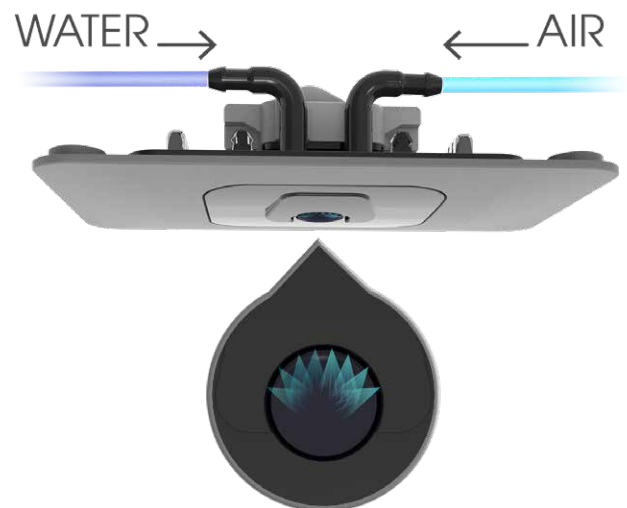


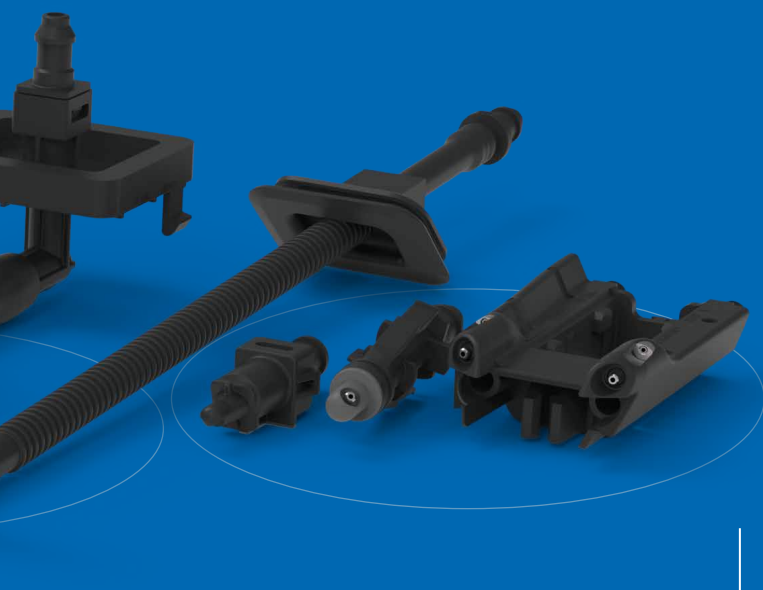
CLEANING PORTFOLIO



INNOVATION EXPERTISE

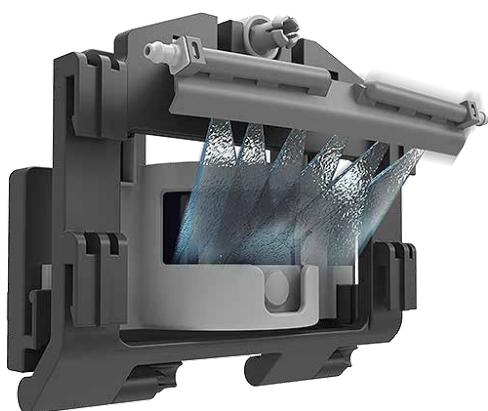
Custom solution developments for ADAS & Autonomous driving





NOZZLES & JUMPER TUBES ASSEMBLY

Mounted on or under the hood of the car, on the cowl, in the stop lamp, spoiler or on the wiper arms, our nozzles can accommodate all front and rear windshields, as well as cameras and sensors. Options include integrated non-return valves, seals, and heated nozzles.



High-precision LIDAR cleaning and optimized water distribution with multi-outlet nozzles.



High-speed cleaning and low water consumption with integrated electromagnetic valves.

CASE STUDY #1

MAXIMIZED CLEANING PERFORMANCE WHILE KEEPING THE FRONT TRUNK DRY



CHALLENGE

A high-end and rear-engine car, equipped with a “frunk,” with little space to integrate components.



SOLUTION

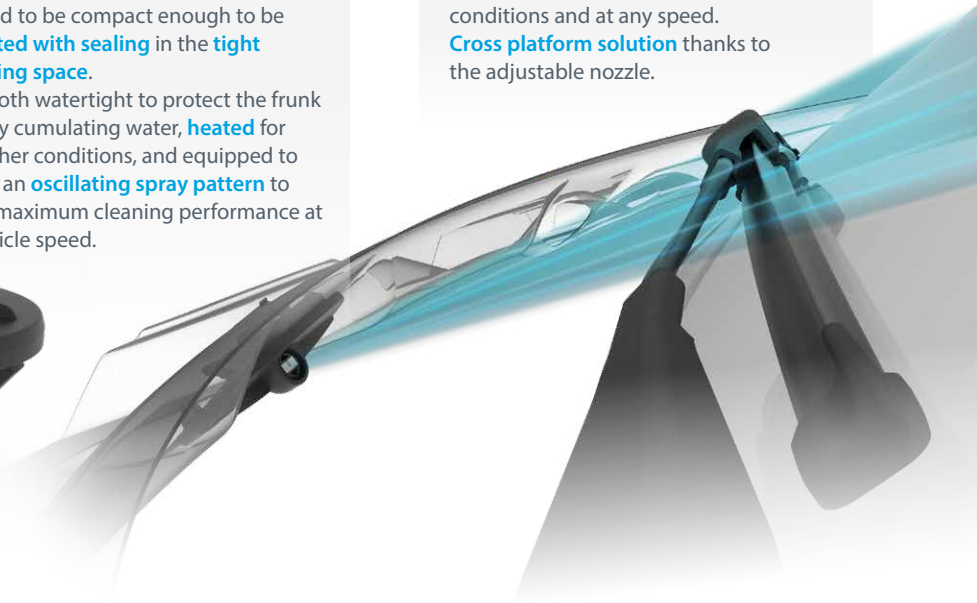
Our engineering team was invited as experts to rain tests at the customers’ to observe and improve the current solution. They came up with a front washer nozzle designed to be compact enough to be **integrated with sealing** in the **tight packaging space**.

It was both watertight to protect the frunk from any cumulating water, **heated** for all weather conditions, and equipped to provide an **oscillating spray pattern** to ensure maximum cleaning performance at any vehicle speed.



CUSTOMER BENEFITS

Esthetic solution, easily integrated to the body in white, ensuring water tightness to protect the trunk. **Impeccable** windshield **cleaning** in all weather conditions and at any speed. **Cross platform solution** thanks to the adjustable nozzle.



CASE STUDY #2

EXPANDED WINDSHIELD CLEANING FOR BOTH DRIVER VISION AREA AND UPPER PART CAMERA



CHALLENGE

A high-end vehicle, with high aesthetic requirements needed a powerful cleaning solution.



SOLUTION

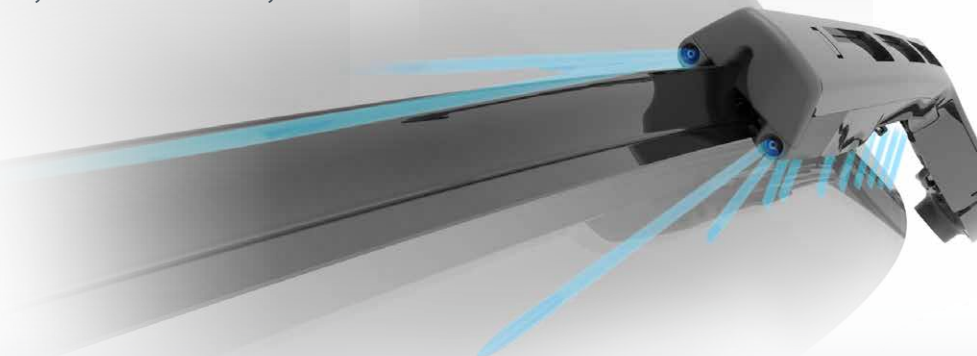
The ARaymond solution consisted of a **two ramp cleaning** system **integrated directly into the wiper arm**.

Two heated nozzles were designed to fit into each side of the wiper arm, allowing **effective** and **secure cleaning** of the complete windshield. The nozzle body holds and fastens the wiper blade, which enables easy access and serviceability.



CUSTOMER BENEFITS

Aerodynamic and **sleek design**, ensuring **efficient water consumption**. Secure cleaning thanks to the direct water application from the wiper blades that maintain the driver visibility.



CASE STUDY #3

REAR WINDSHIELD CLEANING SUITABLE FOR SEVERAL CAR LINES



CHALLENGE

A major OEM was looking for a cost-effective and sealed nozzle suitable for different car body configurations.



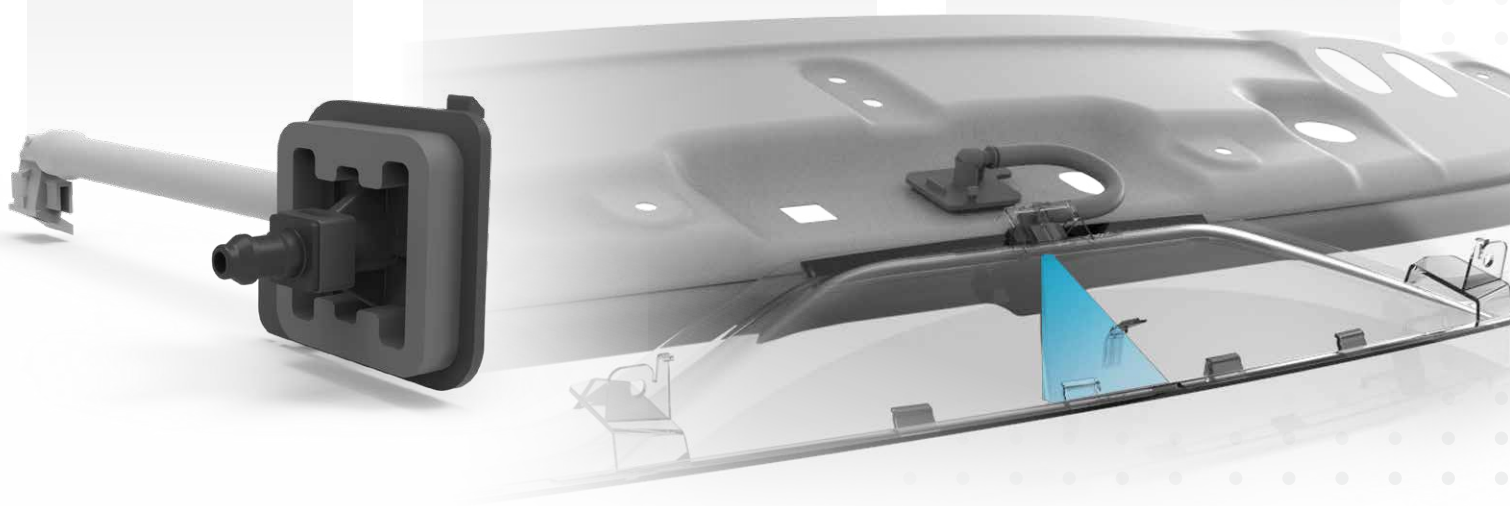
SOLUTION

For this case, we provided a **standard solution that is both** flexible and modular. A high-quality nozzle that can be equipped with different **fluidic chips** depending on the required fan spray angle. The **orientation of the nozzle head can be adapted** to different backlite angles by adjusting the holding fixture in the spoiler.



CUSTOMER BENEFITS

This flexible and worthwhile solution enables **standardization** between car lines. The **high-performing nozzle** with an **oscillating fan spray** and an integrated non-return valve provides **precise cleaning** with an optimized quantity of water.



CASE STUDY #4

INVISIBLE AND RELIABLE HIGH PRECISION CLEANING FOR THE REAR CAMERA



CHALLENGE

Integration of a cleaning system for a rear-end camera where very little space was available.



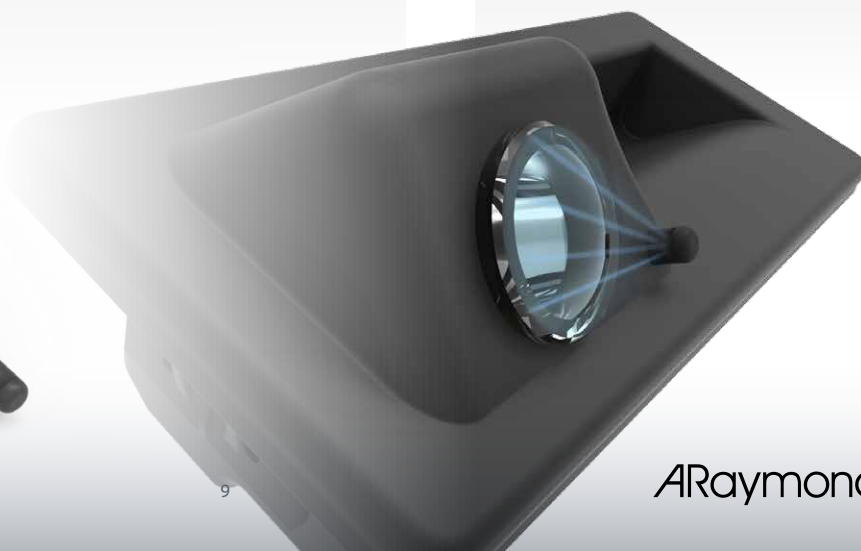
SOLUTION

The ARaymond's response to this request was an **ultra-thin nozzle** with **jet precision** developed for very tight packaging areas. The nozzle with an integrated **non-return valve** was embedded into the trunk handle.

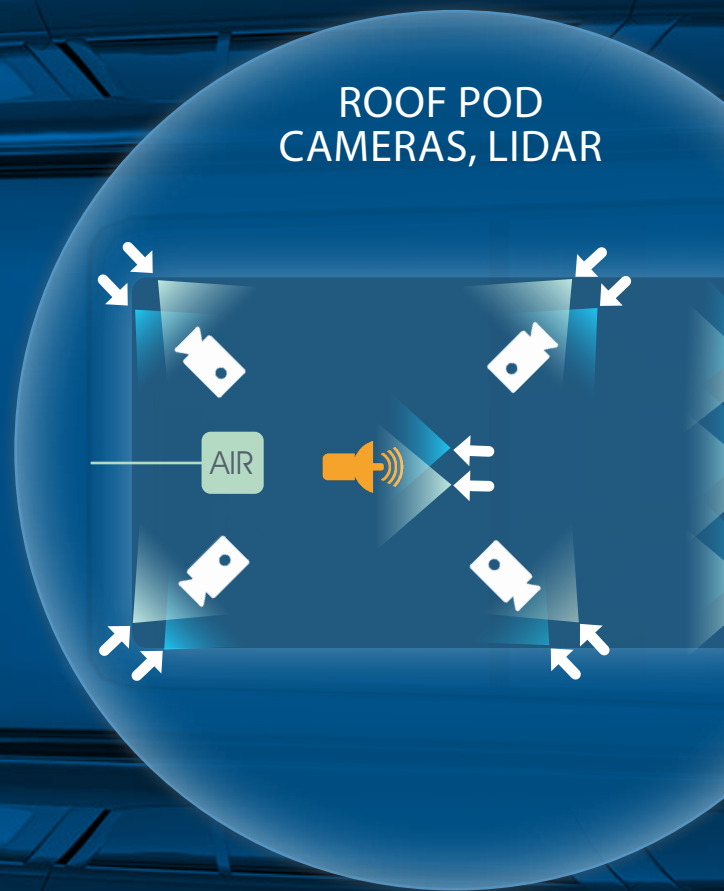
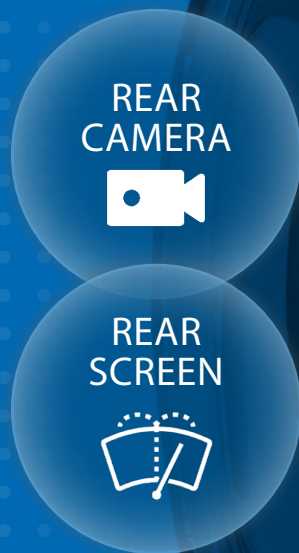


CUSTOMER BENEFITS

This compact and **invisible powerful cleaning** nozzle maintains the **camera clean at all times**.



APPLICATION AREAS



SOLUTIONS PER APPLICATION AREA

WINDSHIELD



Front nozzle mounted on or under the hood, on the cowl, on the screen or the wiper arms.

- Oscillating fan
- Jet (eyeball)
- Adjustable
- Heated
- Integrated non-return valve

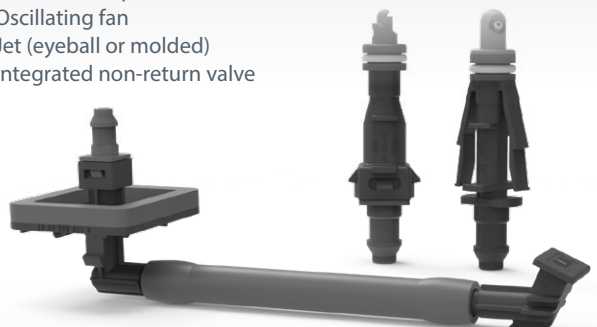


REAR SCREEN



Mounted to the center high mounted stop lamp, spoiler, or sheet metal.

- Static fan (chip or molded)
- Oscillating fan
- Jet (eyeball or molded)
- Integrated non-return valve





CAMERA & SENSORS



Mounted in the front bumper, tailgate, grab handle, roof pod.

- Static fan (chip or molded)
- Jet (eyeball or molded)
- Integrated non-return valve
- Multi outlet



ROUTING MANAGEMENT

Supply tube routing, attachment to the body, and connections.

- Unions
- Tape-on and fir tree
- Quick Connectors (straight, 90°, tee, and non-return valve)
- Inline non-return valve (sleeve, diaphragm, Quick Connector)



WINDSHIELD FRONT NOZZLE



TYPE
OF SPRAY

JET STREAM



Efficient cleaning
at high speed

OSCILLATING FAN SPRAY



Low water
consumption

COMBINATION SPRAY



High and low speed
spray pattern

MOUNTING ENVIRONMENT

Mounted to the hood,
under hood, cowl screen

BENEFITS

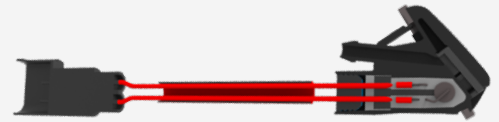
INTEGRATED FUNCTIONS



Non-return valve

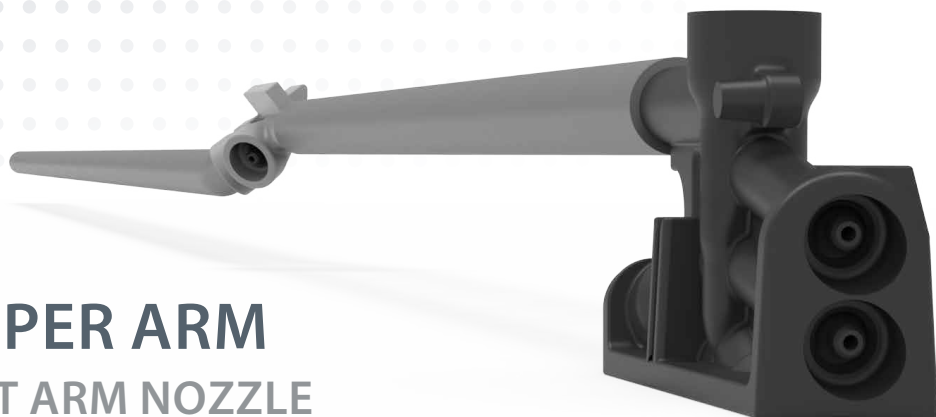


Ball adjustment
to orientate
the spray pattern



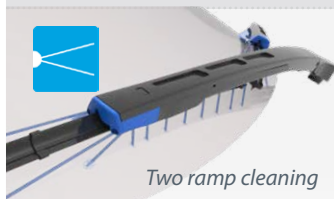
Heating and sealing

WIPER ARM WET ARM NOZZLE

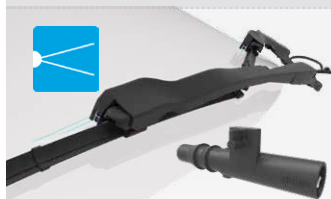


TYPE
OF SPRAY

JET STREAM



JET STREAM



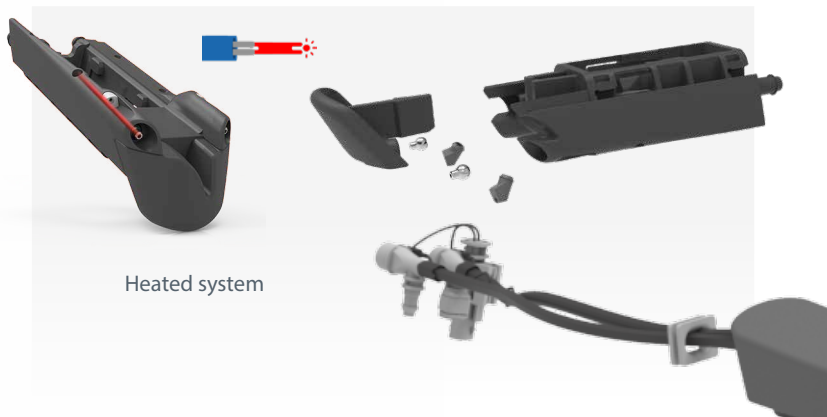
BENEFITS

Directly integrated in the wiper arm for efficient and secure cleaning

MOUNTING
ENVIRONMENT

Wiper arm

INTEGRATED FUNCTIONS



REAR SCREEN REAR NOZZLE

TYPE
OF SPRAY

JET STREAM



OSCILLATING FAN SPRAY



FAN SPRAY



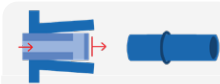
Integration of nozzle into critical packaging
Consistent water distribution

BENEFITS

MOUNTING ENVIRONMENT

Center high mounted
stop lamp, spoiler,
or sheet metal

INTEGRATED FUNCTIONS



Non-return valve and o-ring



With hose, seal and non-return valve

SENSORS

CAMERA NOZZLE



TYPE
OF SPRAY

JET STREAM



FAN SPRAY



BENEFITS

BEFORE CLEANING

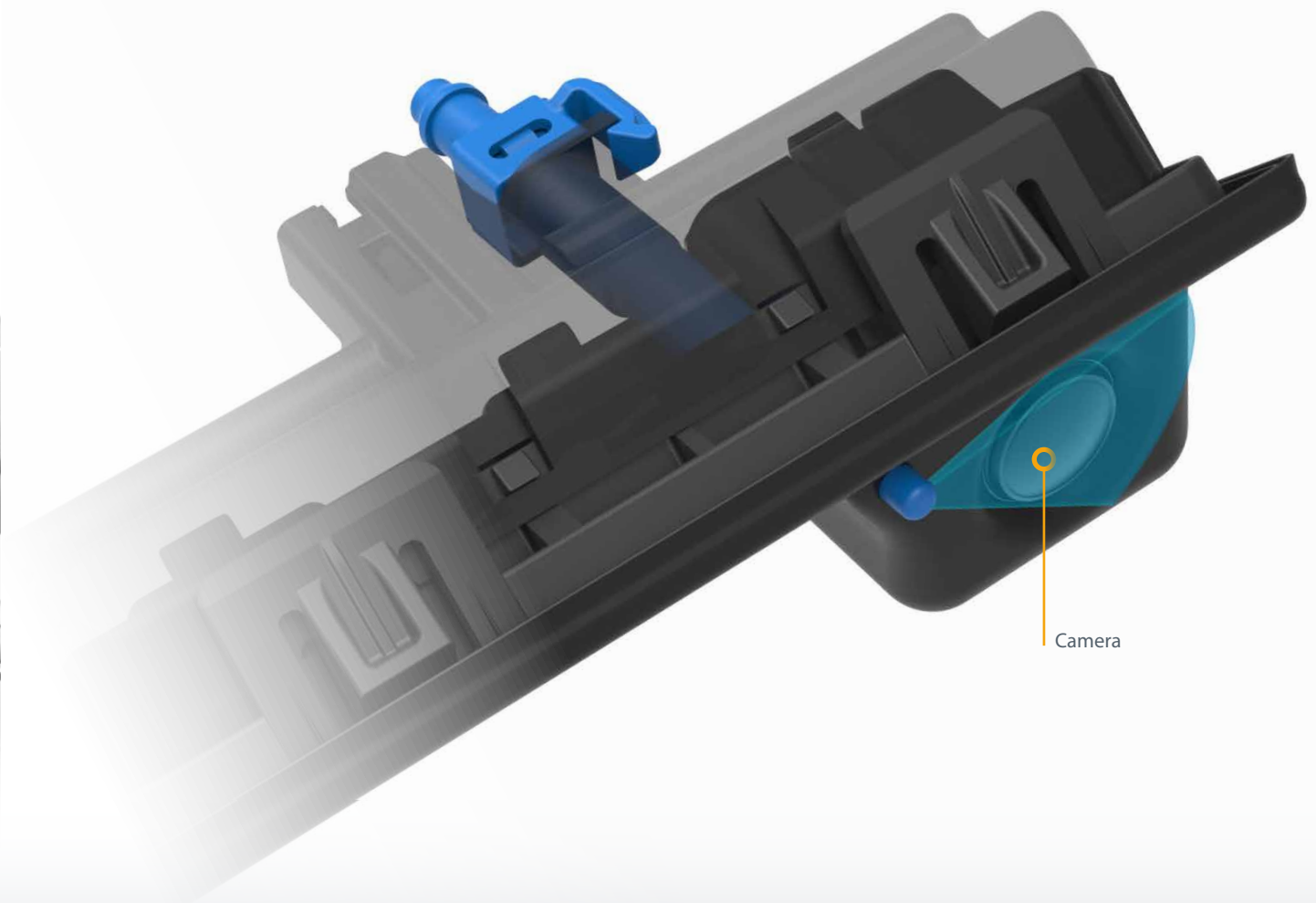


AFTER CLEANING



MOUNTING ENVIRONMENT

Front bumper, front upper,
tailgate, side mirror, B-pillar,
roof pod, handle grip



Camera

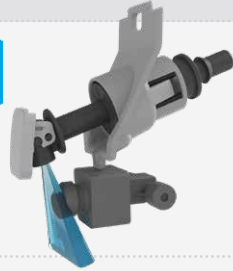
SENSORS

TELESCOPE NOZZLE



TYPE
OF SPRAY

FAN SPRAY



- Max Hub 35 mm
- Fluid pressure 1-6 bar
- Spray operates in end position only
- Adjustable spray angle
- Non-return valve included
- No draining when nozzle is in open position
- Flow rate 900 ml/min at 2.5 bar

FAN SPRAY



- Max Hub of 10 mm
- Fluid pressure 2-8 bar
- Spray operates in end position
- Integrated non-return valve
- No draining when nozzle is in open position
- Flow rate 750 ml/min at 2 bar

TECHNICALS
DETAILS

MOUNTING ENVIRONMENT

Bumper, side mirror,
roof pod

WASHING LINES

WASHER NOZZLE ASSEMBLY



ASSEMBLY LINE
COMPONENT



A complete nozzle assembly best suited to customers' requests with our spray nozzles, couplings, connectors, integrated hose non-return valves, and hose fastening solutions.

PRODUCT
BENEFITS

MOUNTING ENVIRONMENT

Washing lines

ROUTING MANAGEMENT

MINI QUICK CONNECTORS Ø4.87 mm



MOUNTING ENVIRONMENT

Washing line

BENEFITS

Easy and quick assembly - Proof of connection by acoustical feedback - Perfect serviceability - Compact and smart design

TECHNICAL DETAILS

- Assembly force < 25 N
- Pull out force > 100 N
- Burst pressure QC > 40 bar
- Side load > 100 N
- Temperature range -40°C to 90°C



Require a male connector
ARaymond standard S15-000077

OPTIONS

- Optional dust plug
- End cap design
- T-Shape
- Flow reduction

- Integrated non-return valve
- Retaining spring coverage
- Standard EPDM, corrugated and customized unions



QUICK CONNECTORS Ø9.50 mm



MOUNTING ENVIRONMENT

Washing line

BENEFITS

Easy and quick assembly - Proof of connection by acoustical feedback - Perfect serviceability - Compact and smart design

TECHNICAL DETAILS

- Assembly force < 40 N
- Pull out force > 350 N
- Temperature range -40°C to 90°C
- Burst pressure QC > 16 bar
- Side load fir tree > 150 N



Require male connector
ARaymond standard S15-000078

OPTIONS

- Optional dust plug
- End cap design
- T-Shape
- Flow reduction

- Integrated non-return valve
- Retaining spring coverage
- Standard EPDM, corrugated and customized unions



ROUTING MANAGEMENT

NON-RETURN VALVES



MOUNTING ENVIRONMENT

Washing line

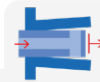
BENEFITS

Compact design
Wide range of catalog parts
Modular design and mold kit

TECHNICAL DETAILS

Temperature range -40°C to 90°C
Burst pressure NRV > 10 bar

OPTIONS



SILICON SLEEVE TYPE

Different opening pressure

- Sleeve I 0.1 to 0.4 bar
- Sleeve II
- Sleeve III 0.3 to 0.5 bar



SPRING PISTON TYPE

0.1 to 0.25 bar

UNIONS



MOUNTING ENVIRONMENT

Washing line

PRODUCT BENEFITS

Compact design
Modular design and mold kit

TECHNICAL DETAILS

Temperature range -40°C to 90°C

DESIGN OPTIONS



MALE END FORM QC Ø9.50 mm

- Std EPDM and corrugated pipe union
- Modular mold concept for new design



MALE END FORMS MINI QC Ø4.87 mm

- T-shape design
- Y-shape design
- L-shape design



Customized male connectors

ROUTING MANAGEMENT

PIPE FASTENERS



MOUNTING ENVIRONMENT

Washing line

BENEFITS

Wide range of catalog fastening clips for EPDM and corrugated washing lines with low assembly forces, and high retention forces. Metal, plastic and hybrid solutions.

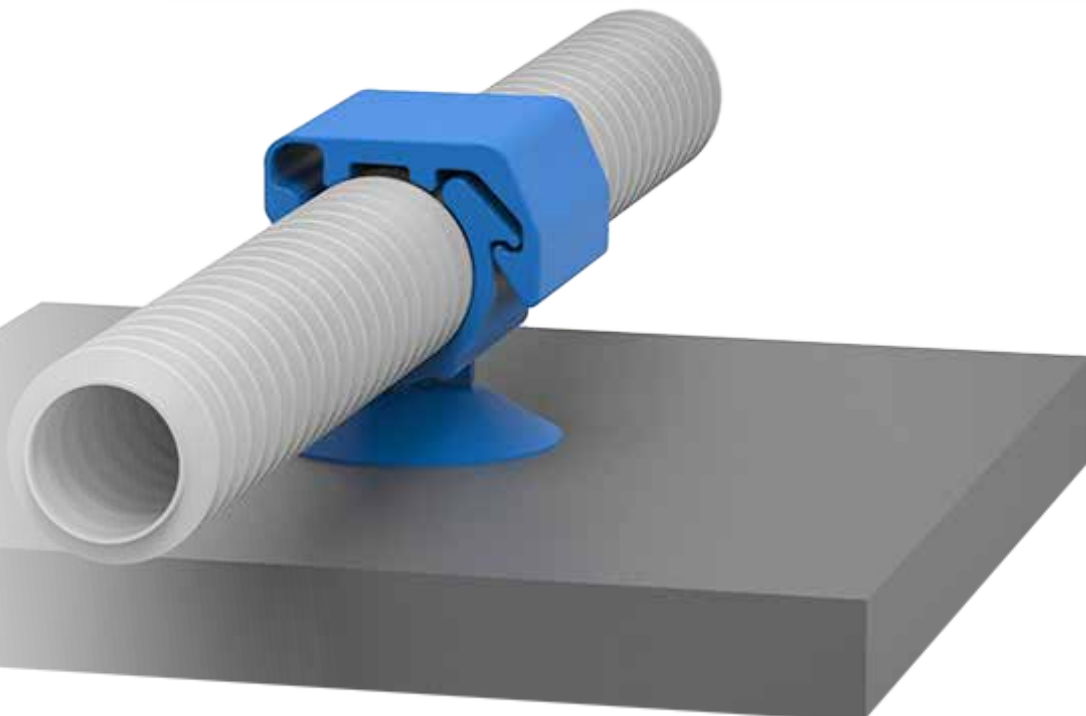
DESIGN OPTIONS

MOUNT

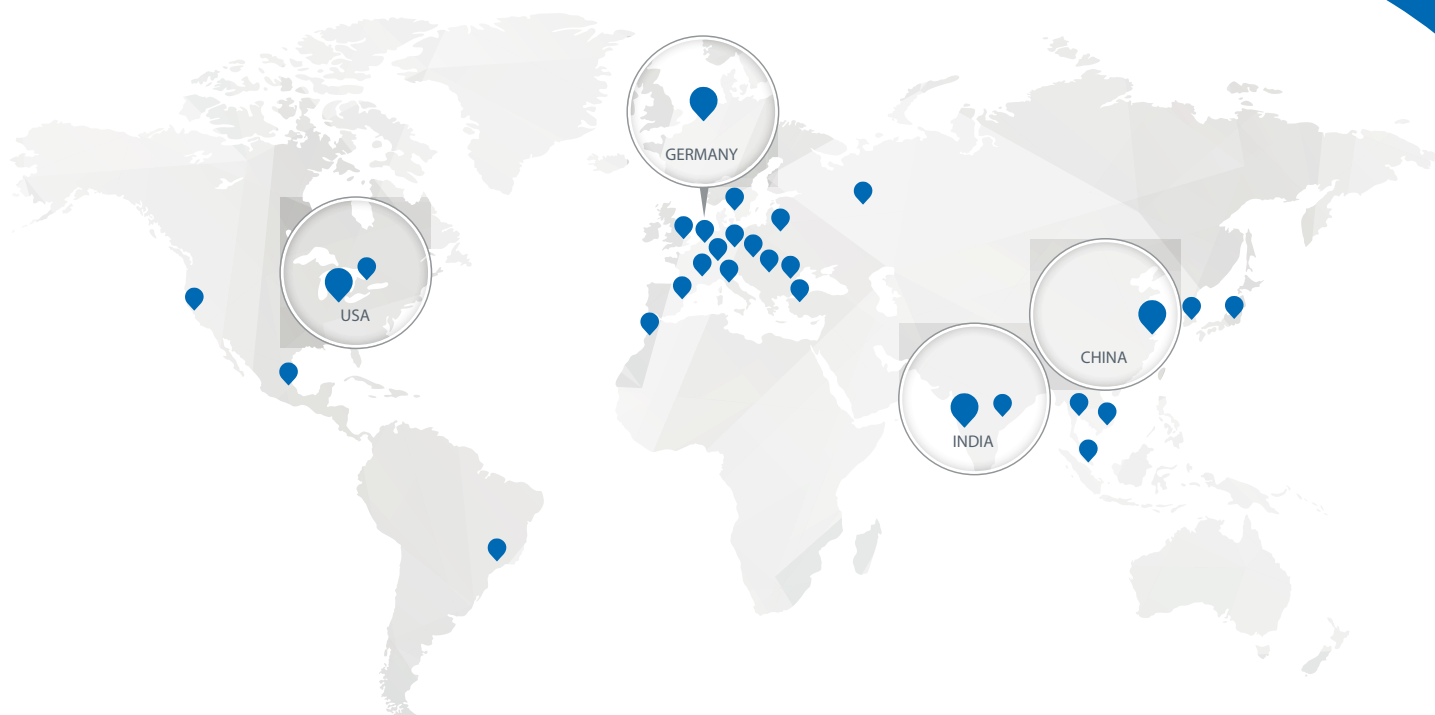
- Round hole
- Oblong hole
- Cavity
- Stud mount
- Edge mount

DESIGN

Our pipe holders are available in several designs for a wide range of diameters and panel thicknesses.



ARAYMOND CLEANING SYSTEMS EXPERTISE CENTERS



International teams in 3 continents with engineers, sales, and production.
Automatic and semi automatic assembly, functional checks and logistics.

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