



Application Systems for the Highest Standards

State-of-the-art primary packaging for decades

Egon Schwab
founded
Aero Pump



Development
COMOD® System



Development
preservative-free
3K® System

1976

1979

1988

1992

1993

1997



**First
pharmaceutical
customer:**
Hoechst AG
(Sanofi-Aventis)



Development
Emergency Spray
for patients with
cardiovascular
diseases

Foundation of
subsidiary **Ursatec** for
preservative-free systems

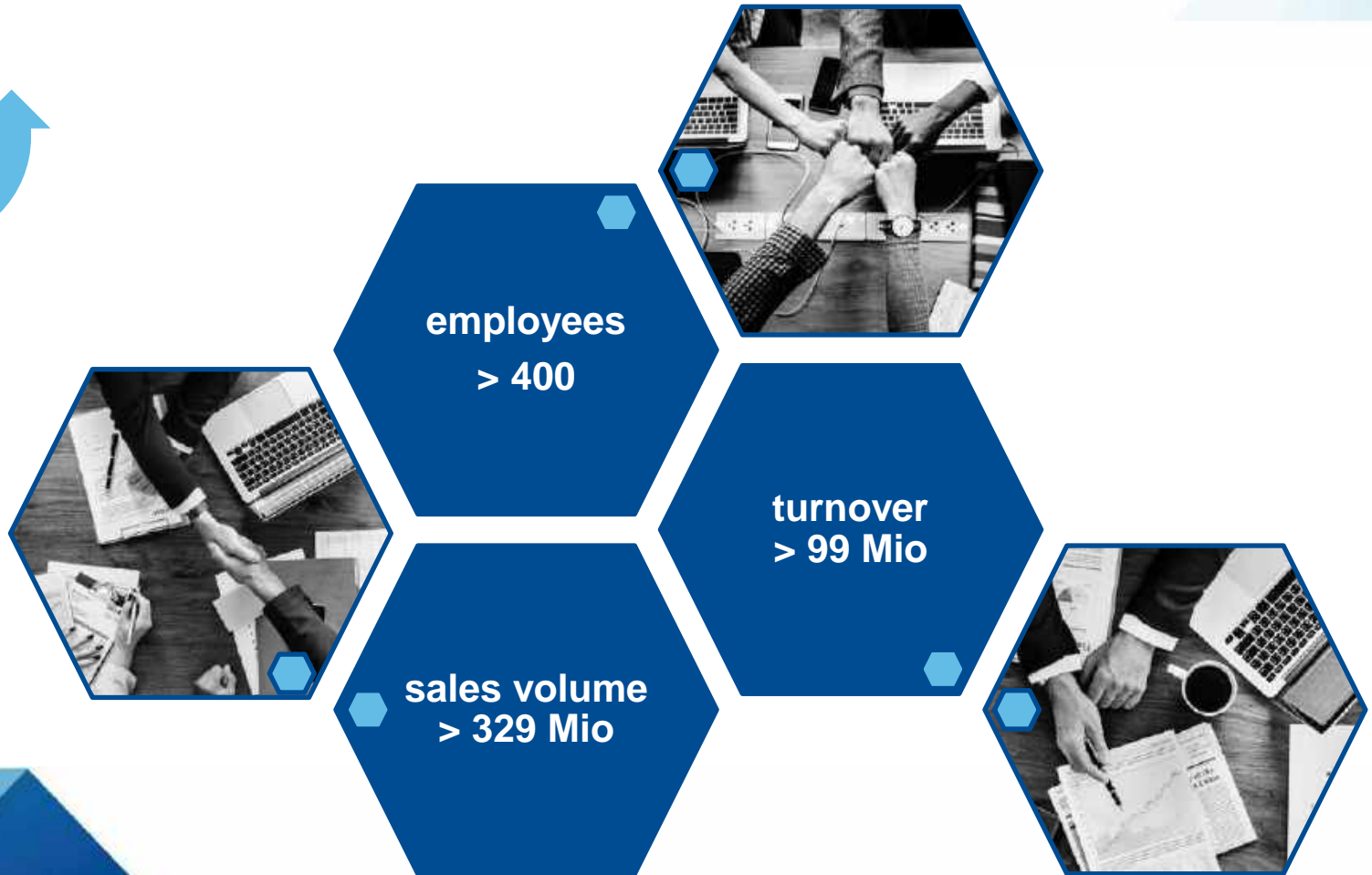
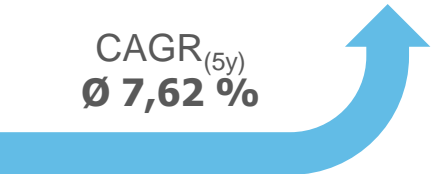


State-of-the-art primary packaging for decades



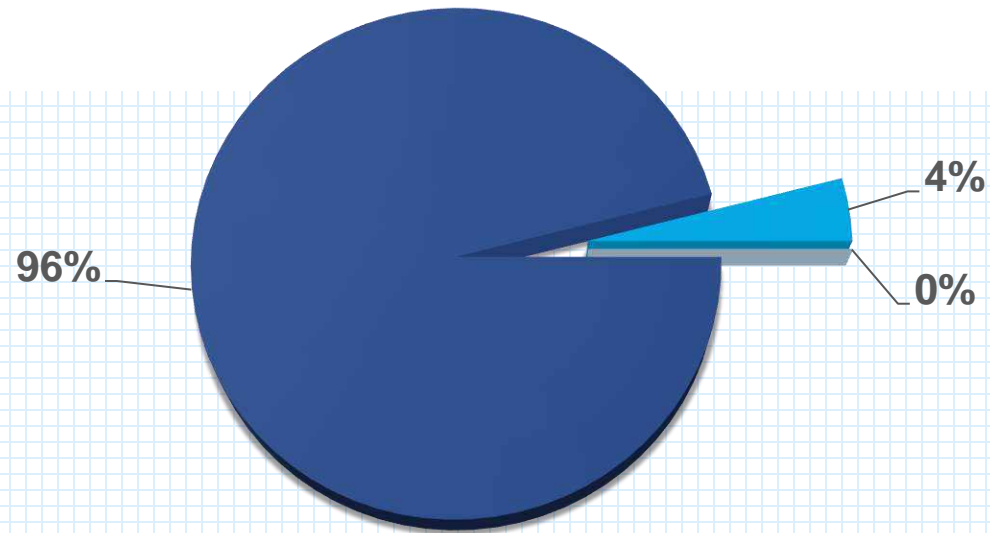
Economic Growth

CAGR_(5y)
Ø 7,62 %



Considered year: 2023

Business Segments



■ Pharma/ Healthcare

■ Cosmetics

■ Technical



Manufacturing

- Revolutionary injection molding concept
- Assembling area 1.750 m²
- Manufacturing process according to GMP
- Complete batch traceability
- ISO class 7 manufacturing conditions



Quality:

We work according to our customers' standards

CERTIFIED QUALITY MANAGEMENT



Quality

DIN EN ISO
9001:2015



Environment

DIN EN ISO
14001:2015



Energy

DIN EN ISO
50001:2018



Primary packaging for pharma- ceuticals

DIN EN ISO
15378:2018-4



Medical products

DIN EN ISO
13485

Portfolio





Ophthalmic Multidose System





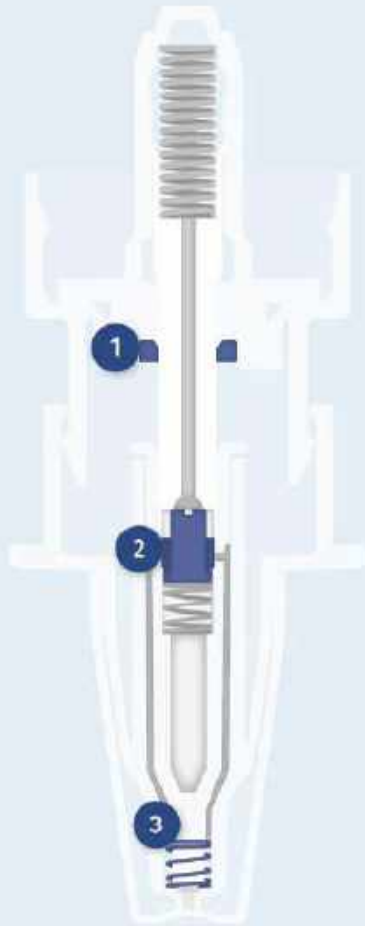
Ophthalmic Multidose System

- Dosages available: 28 mg, 45 mg
- Customized dosage possible
- Compatible with 5 and 10 ml plastic, tubular or molding glass bottles
- Snap-on closure is safe from inadvertent opening
- Mechanical pump for constant actuation force until completely empty
- Suitable for various formulations and viscosities





Ophthalmic 3K[®] Technology



The 3K[®] system with triple protection



The filter matrix prevents contaminated air ingress.



The valve is protected against reflux and prevents product backflow.



A coil with oligodynamic effect in the tip prevents microbiological growth.



Patient Usability

ComfortGrip

- Increased patient's safety
- Intuitive and easy to use
- Optimized actuation grip



SAD

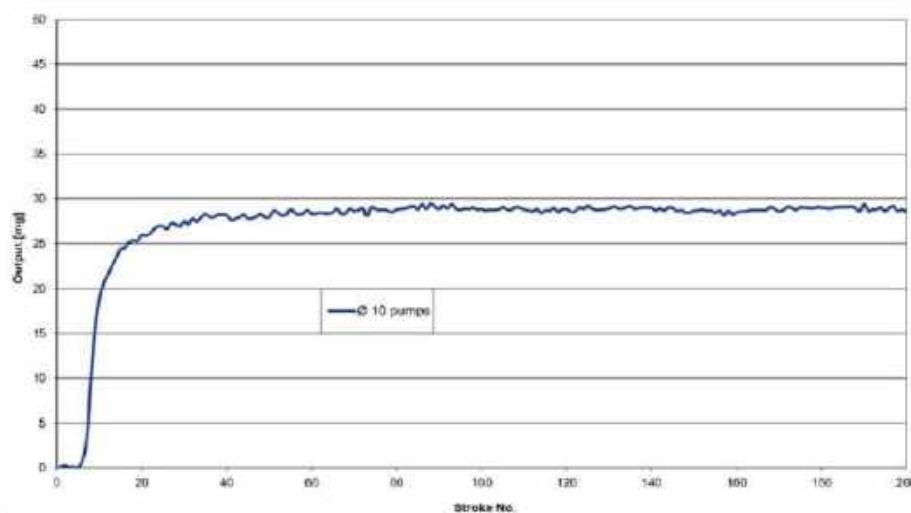
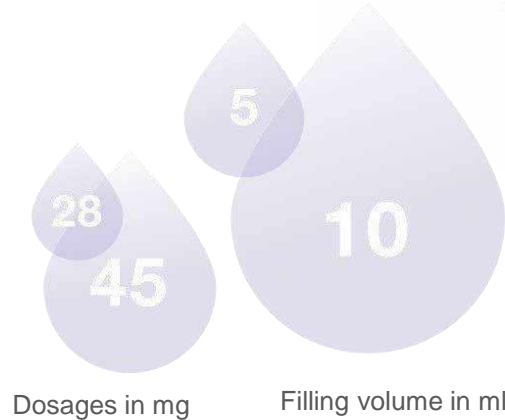
- SideActuationDevice
- Reduced actuation force
- Intuitive and easy handling
- Pump system with accurate dosing



Metered dose / Documentation

Metered dose

- Exactly defined drop size
- One drop per actuation



Documentation

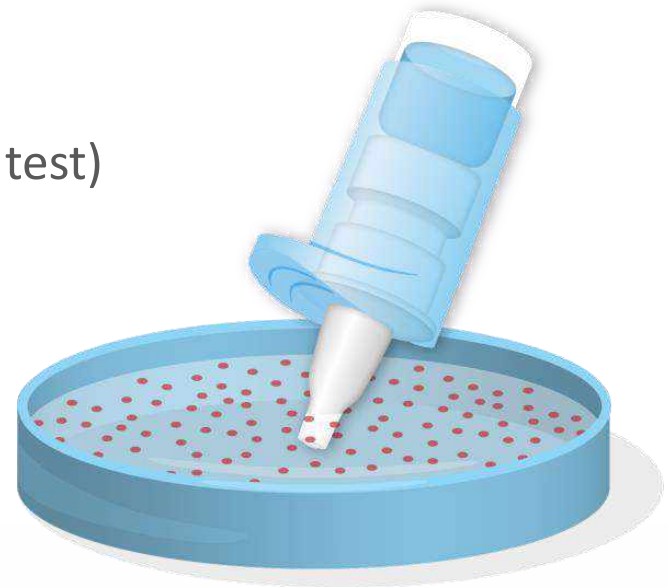
- Drug Master File
- Complete material documentation
- Technical drawings
- Extractables data
- Material data sheets



Microbiological Challenge Test

Analyses

- Dynamic Integrity test
 - Oligodynamic effect test
 - In-use stability test
 - Test in contaminated ambient air (aerosol test)
- Test methods according to Ph. Eur 2.6.1
or USP <51>



Bacteria: e.g. *Pseudomonas aeruginosa*



FILLING PROCESS



GMP Class A - Clean Room

Ready, filled, microbiological sealed 3K System



Ophthalmic Sprays

Lidspray

- Application onto the eye lid (closed eye)
- Product will be dispersed in the eye after blinking

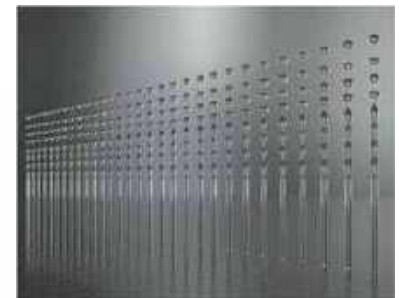
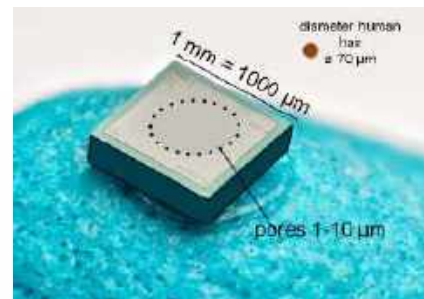


EyeSprayer

- New technology creating a soft mist onto the opened eye, no blink reflex!
- Droplet size $>10\mu\text{m}$ (adjustable via different orifice diameters)

Rayleigh Spray Principle

droplet diameter = $2 \times$ jet diameter



Nasal Application Systems



Adaptable for OTC, Rx and Generics

- Dosages available: 45 to 140 mg
- Customized dosage possible
- Compatible with 10, 15, 20 and 30 ml plastic, tubular or molding glass bottles
- Suitable for diverse formulas and viscosities
- Pump for preservative-free solutions
→ available from partner Ursatec



Snap-on closure

Snap-on closures are safe from inadvertent opening and efficient in processing.



Screw-on closures

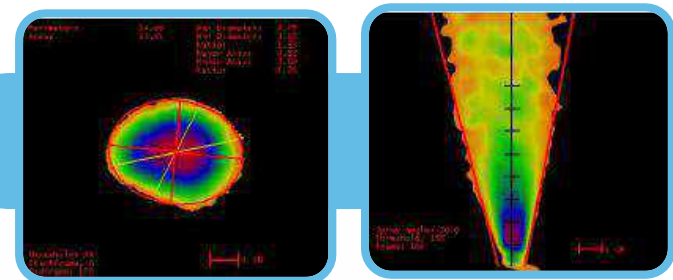
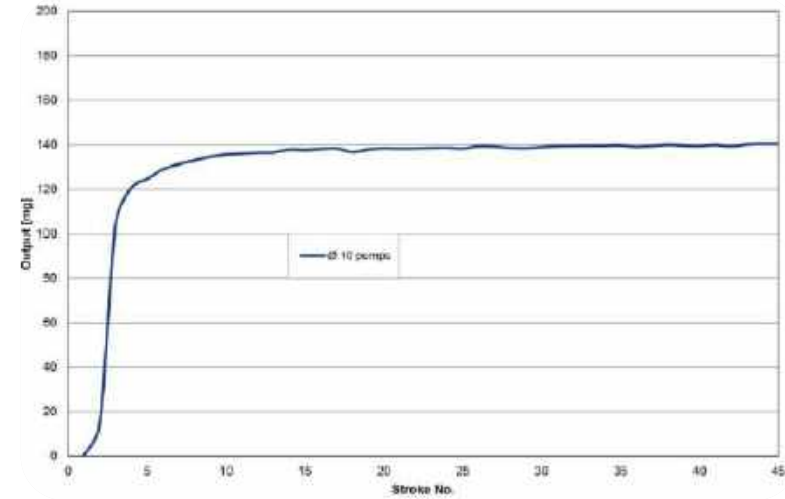
Simple to open by twisting

Precise metered dose

- Exactly defined dosing per actuation
- High dosing accuracy & consistency
- Adjustable spray pattern for individual requirements

- State-of-the-art

Spray Pattern & Plume Geometry analysis



Nasal Dropper / AeroLock CR

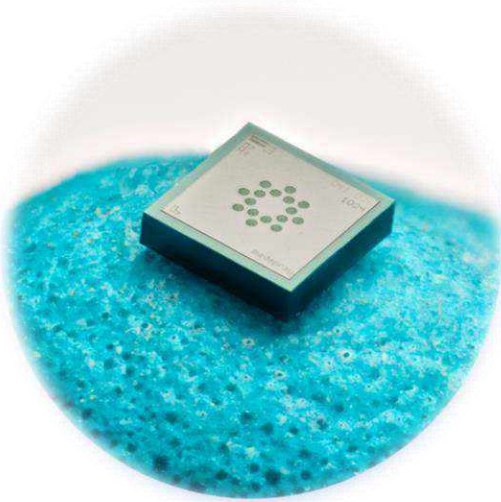


- Defined drop size: 28, 45, 85mg
- Especially suitable for babies & children
- Gentle nasal medication
- Applicable in up-side-down position

- Intuitive push-and-twist system for simple handling
- Function tested according to US 16 CFR § 1700.20 and ISO 8317



SoftSpray / Luer lock Adapter



- Ultra-fine mist for sensitive nasal applications
- Unique and innovative spraying technology
- Fine spray in metered dose

- Our nasal spray adapter for Luer lock systems
- For applications such as flu vaccines
- Cost-effective readily available solution



E-Device valiDOSE



- Exoskeleton for conventional pumps
- Digital augmentation sleeve
- Biometric security/ Temper-evidence
- Improved patient adherence





Pulmonary Application Systems





Unique inhalation technology for liquid medications

Ecomyst90

A unique preservative and propellant-free liquid inhaler that delivers an ultra-fine and dosed spray for prescription products aimed at lung conditions such as COPD and asthma.



SoftBreezer

One of its kind across the world, this preservative and propellant-free liquid spray delivers a dosed ultra-fine spray for gentle application to the mouth, throat, and bronchial area.



Key Benefits

- No propellants – no CFCs, HFAs or VOCs
- Preservative-free application
- Multidose bottle: 200 doses (5 ml bottle) or 400 doses (10 ml bottle)
- Waste prevention due to Multidose design
- Pocketable size

➤ Sustainable and Cost-effective solution





Specification of Soft Mist Inhaler

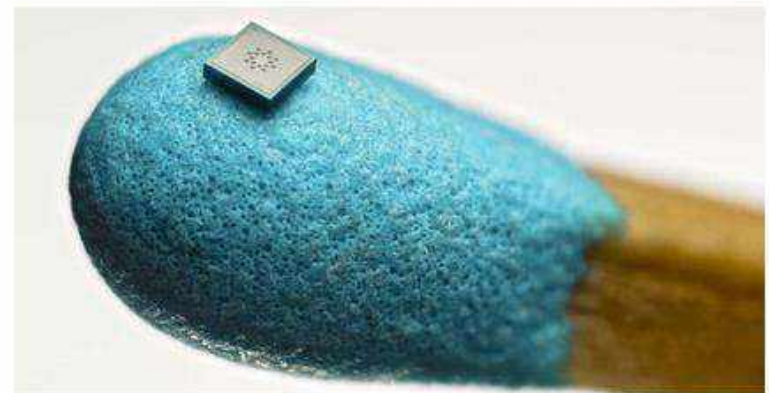
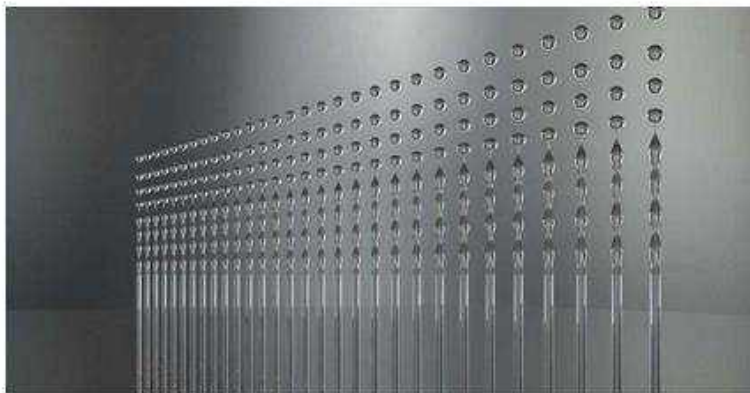
- Metered dose: 25 μ l
- Emitted dose: > 90% of metered dose
- Lung deposition: about 50 %
- Alveolar dose: approx. 20 – 25 %
- Respiratory resistance at 2 kPa: 20 l/min
- MMAD: 3,5 – 7,0 μ m (depending on formula)
- Activation time: 2,5 seconds
- Compatible with 5 and 10 ml plastic, tubular or molding glass bottles





Spray Nozzle Unit (SNU)

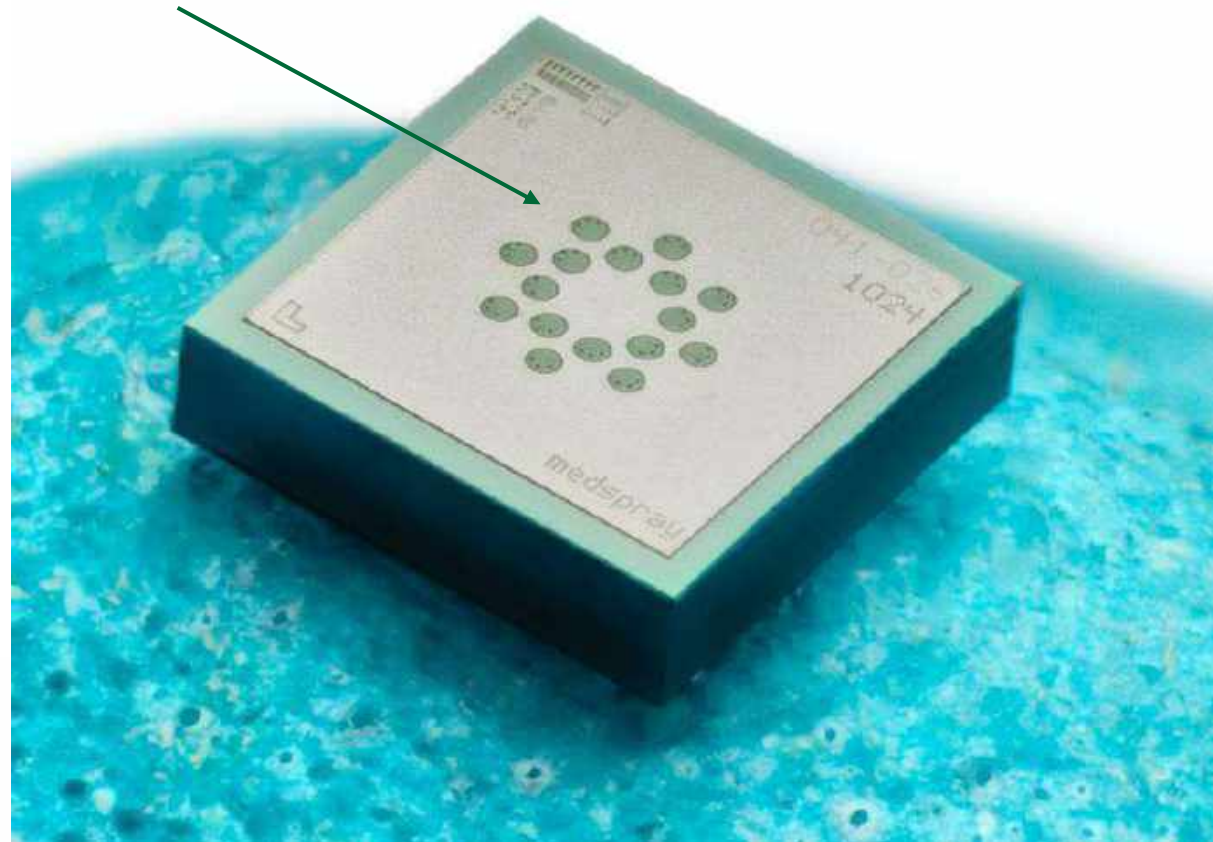
The Spray Nozzle Unit (SNU) ensures innovative ultra-fine spray action. The liquid flows through the nozzle in uniform intervals according to the Rayleigh principle, which ensures an ultra-fine and precisely dosed spray mist. This new nanotechnology in the Spray Nozzle Unit is the first of its kind across the world.





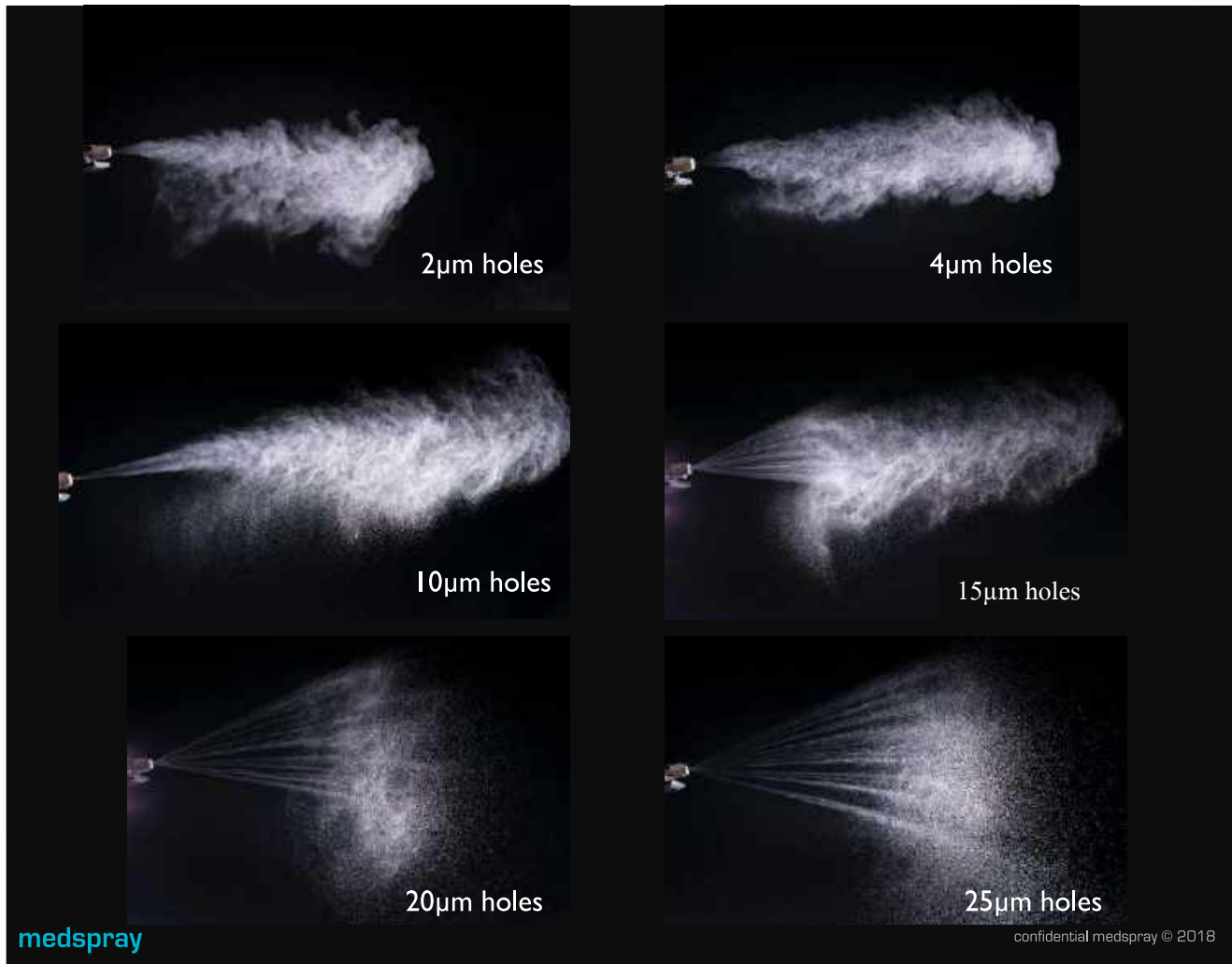
Spray Nozzle Unit (SNU)

Orifice size adaptable between 1 – 50 μm





Spray Nozzle Unit (SNU)





Buccal Spray Application





Adaptable for OTC, Rx and Generics

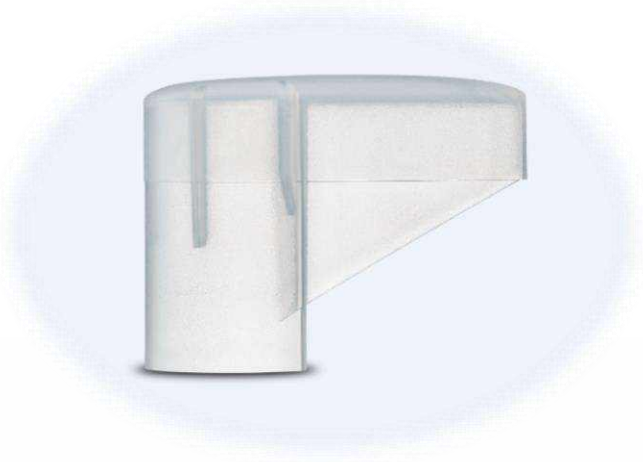
- Dosages available: 100 to 180 mg
 - Customized dosage possible
 - Compatible with 10, 15, 20, and 30 ml plastic, tubular or molding glass bottles
 - Suitable for diverse formulations and viscosities
 - Adjustable spray pattern for individual requirements
 - Pump for preservative-free solutions
- available from partner Ursatec





Mouth Spray / Sublingual Spray

- Examples include acute treatment for cardiovascular disease
- Accurate and reliable dosing
- Fast priming for immediate use



- Protection against nozzle contamination
- Protection against inadvertent activation while on the move
- Available in various colours



Otological Spray Application





Ear Spray Adapter

- Dosages available: 65 to 130 mg
 - Customized dosage possible
 - Compatible with 10, 15, 20, and 30 ml plastic, tubular or molding glass bottles
 - Suitable for diverse formulas and viscosities
 - Microbiological seal directly behind the nozzle
 - Pump for preservative-free solutions
- available from partner Ursatec





Topical Application Systems





Medical products, cosmetics, and industrial applications

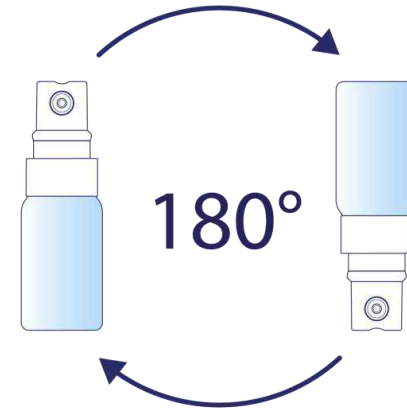
- Dosages available: 45 to 200 mg
 - Customized dosage possible
 - Compatible with 10, 15, 20, 30, and 50 ml plastic, tubular or molding glass bottles
 - Suitable for diverse formulas and viscosities
 - Adjustable spray pattern for individual requirements
 - Pump for preservative-free solutions
- available from partner Ursatec



Solutions for special requirements

UpSideDown

- Application with the pump upright or upside-down
- Ideal for applications in difficult to reach areas
- 140 mg dosing



Airless

- 360° applicable
- Closed system – no air ingress
- Supports special patented bag-in-bottle system

Solutions for special requirements



Long Nozzle

- For high-viscosity fluids (e.g. oils)
- Unique design
- Exact dose



CRC Nozzle

- For creams and high-viscosity fluids
- Unique design
- Exact dose



Ultra-Soft Spray

- For spraying ultra-fine mist in sensitive applications
- Innovative and unique spraying technology
- Fine spray in metered dose

Support



- ✓ Dosage determination test
- ✓ Droplet size distribution (DSD)
- ✓ Spray Pattern & Plume
Geometry analysis
- ✓ Actuating force determination
- ✓ Priming and repriming
behaviour

- ✓ Drug Master Files
- ✓ Complete material
documentation
- ✓ Technical
drawings
- ✓ Extractables data
- ✓ Safety data sheets

- ✓ Dynamic Integrity test
- ✓ Aerosol test
- ✓ Oligodynamic effect test
- ✓ In-use stability tests



Thank you for your interest in our company and products!