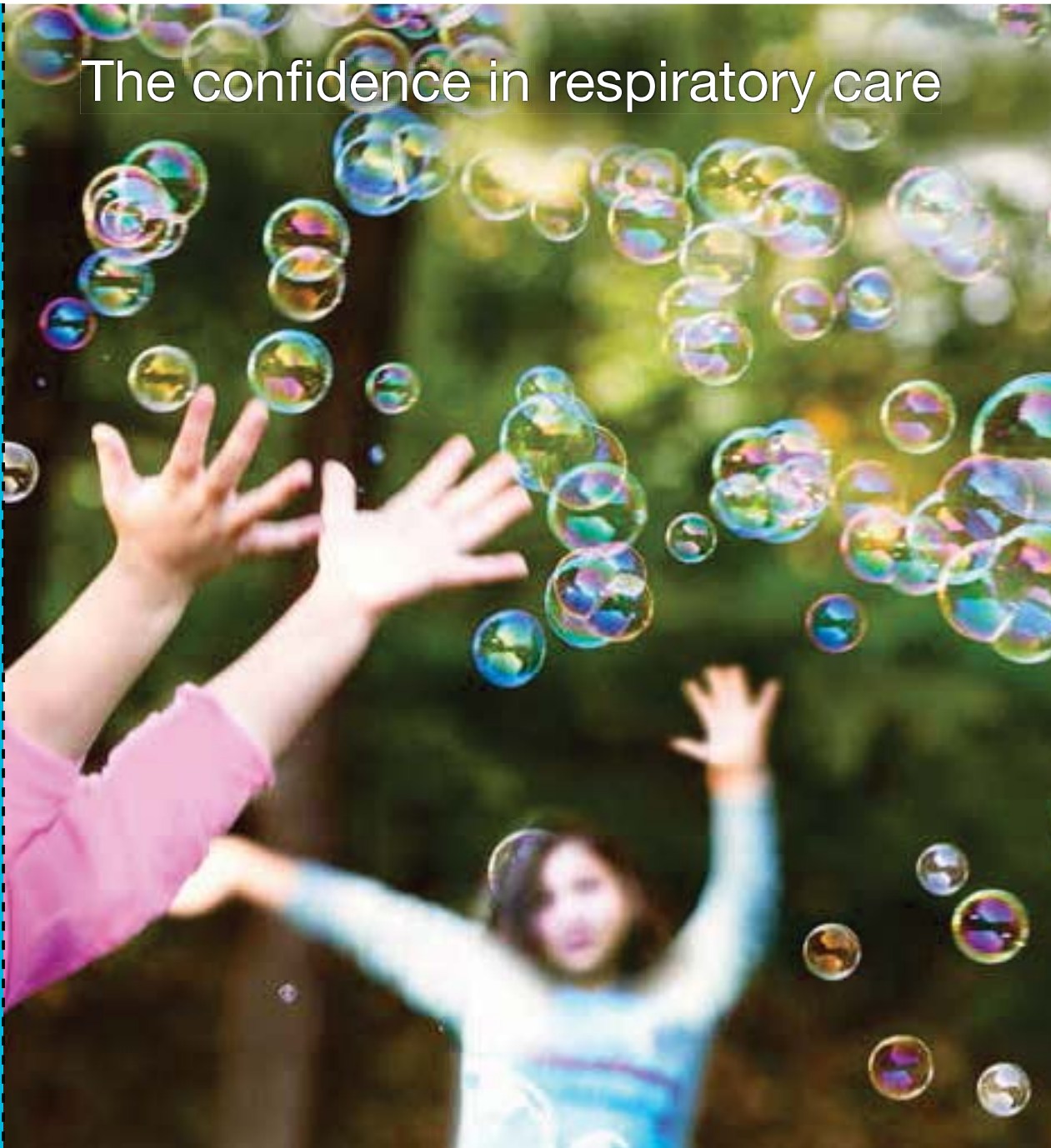


Inhalation systems for aerosol therapy

The confidence in respiratory care



Introduction to topical inhalation therapy

Compressor aerosol units and nebulizers for topical treatment

Devoted

to customers' satisfaction, our mission is to improve the quality of patients' life affected by respiratory pathologies concentrating our research on efficient and non-invasive technologies to offer both doctors and patients reliable and effective devices, easy to use and respecting the environment.

Believing

in the benefits of aerosol therapy as topical treatment, our company is the first one to develop two separate nebulizers for the targeted treatment of the upper and lower airways.

We create

nebulizers aiming to guarantee all the patients, both children and adults, the following advantages from topical inhalation therapy, considered the most effective method for respiratory diseases:

Topical treatment using a specific nebulizer allows drug deposition directly in the target organ.

The local administration of reduced doses of drug avoids the problem of systemic side effects and makes the treatment more effective.

Topical treatment is normally well tolerated and more than one drug can be atomized simultaneously if prescribed.

Key-words in aerosoltherapy

Here you are some frequent definitions in aerosol therapy.

Aerosol

Suspension of liquid particles in a gas.

Nebulizer

A device that converts a liquid into an aerosol.

Aerosol device

A device comprised of a nebulizer and an electromechanical part that converts a liquid into an aerosol and makes it available for inhalation.

Airways

The body's natural ducts through which air is conveyed to the pulmonary alveoli.

Atomization

The reduction of a substance into particles around thousandths of a millimetre in diameter, expressed in microns (μm).

Atomization efficacy

The ability of the aerosol device to convert a given volume of liquid into micronized particles.

Dynamic pressure

The output pressure generated by the nebulizer, generally expressed in bars. This parameter is influenced by the power source and dimensional factors.

Dynamic flow or dynamic capacity

The rate of air flow generated by the nebulizer, in litres per minute (l/min). This parameter is influenced by the power source and dimensional factors.

Output or rate of flow

The quantity of aerosol delivered by the system in a unit of time.

Maximum filling volume

The maximum volume of liquid that the base of the nebulizer can hold, expressed in millilitres (ml) or cubic centimetres (cc).

Residue

The amount of un-atomized drug remaining in the nebulizer at the end of treatment.

Mean Mass Aerodynamic Diameter (MMAD)

This parameter indicates the ability of the nebulizer to produce small size particles, which are necessary for the treatment to be effective.

The diameter of 50% by volume of the particles atomized by the nebulizer is lower than the MMAD, the remaining 50% is higher than the MMAD.

Every product, entirely manufactured in Italy, is studied to offer a specific solution to get the best therapy's effectiveness

Introduction to topical treatment



Rinowash Micronized nasal douche

Connected to a compressor aerosol unit, it is ideal for treating rhinitis, rhinosinusitis, nasal polyposis, adenoiditis and tubo-tympanitis using drugs or SPA water, saline and physiological solutions, it enhances deposition in the **upper airways** as it produces **particles with a MMAD of 18 μm** .

- Convenient and compatible with all compressor aerosol units
- Atomizes 5 ml solution in 2 minutes
- Usable as from a very early age, with no contra-indications
- A special patented internal valve controls the output pressure in the nasal cavities to prevent the risk of barotraumas.



Rinowash Solution

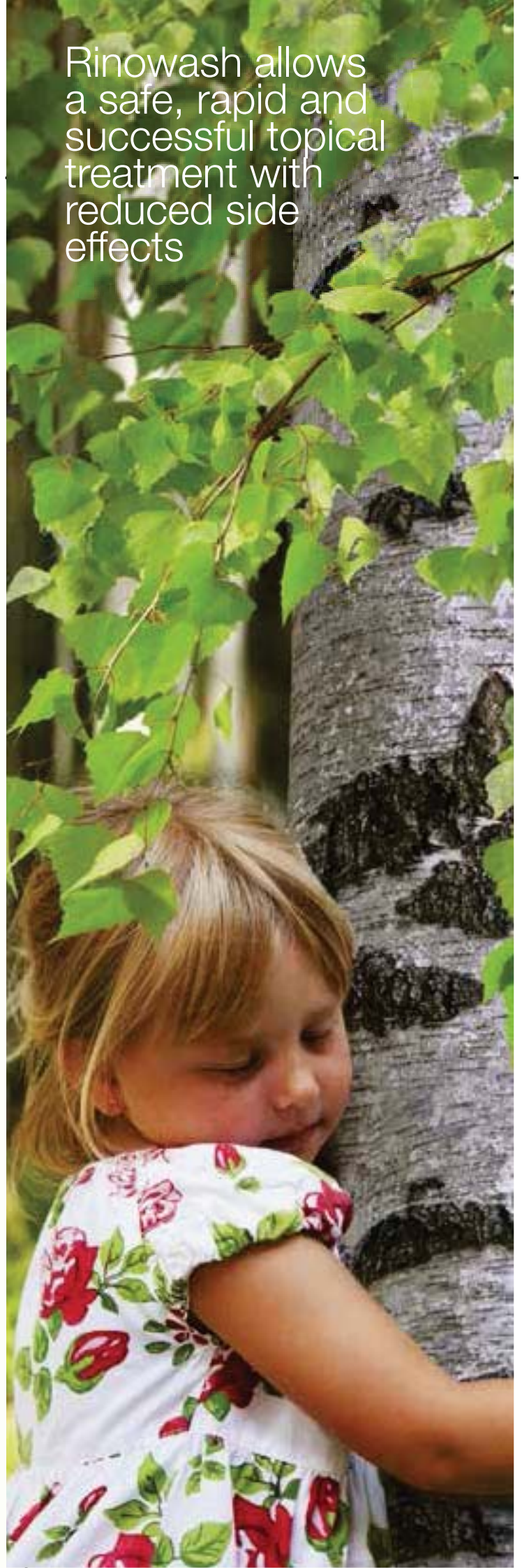
Hypertonic saline solution, ideal for flushing out the nasal cavities.

Thanks to its **osmotic action**, the use of Rinowash saline solution with the micronized nasal douche is associated with **greater improvement** in nasal patency or/and oedema reduction.

Please see instructions manual for any additional information



Rinowash allows
a safe, rapid and
successful topical
treatment with
reduced side
effects



Volumetric masks and nebulizers

Nebula Spacer

Volumetric mouth mask for adults and children.

Nebula Spacer is studied for **broncho-pulmonary apparatus** taking care of bacterial or viral infections, asthma, bronchitis, pneumonia, cystic fibrosis. Connected to a compressor aerosol unit, Nebula Spacer guarantees **an efficient therapy in a shorter time** (2' to nebulize the complete therapeutic dose).



- Universal and functioning with all compressor aerosol units
- Ideal for cooperating patients
- Guarantees bronchial deposition of the atomized drug as it produces particles of the right size (1 - 5 microns)
- The ergonomic shape increases the patients' comfort during therapy

Perfecta

Volumetric oro-nasal mask especially shaped for babies and young children.

Perfecta delivers the drug straight into the lower airways, and the whole treatment **only takes two minutes** to nebulize the prescribed dose.

Producing very small particles ideal for treating **pathologies affecting the lower respiratory tract**: bacterial or viral infections, asthma, bronchitis, pneumonia, cystic fibrosis.

The special shape of the mask and the soft material make it suitable for very **young children** who are not cooperative, **covering both mouth and nose**.

- Universal and functioning with all compressor aerosol units
- Producing particles sized 1-5 microns, it is suitable for the lower airways
- Easily tolerated by users of any age, it reduces side effects and enhances therapy effectiveness



Please see instructions manual for any additional information

Perfecta and Nebula Spacer are well accepted by patients of any age and improve their compliance

Nebulizers and interfaces



The **reservoir function** given by the mask's larger volume, combined with the **breath-enhanced effect** of the nebulizer, allows an optimal bronchial deposition.

Rinowash, Perfecta and Nebula Spacer are available as **separate devices** (to be connected to compressor aerosol units) and also **supplied with our aerosol units** Nebula, Mobyneb, Soffio Plus.

Information about these units are in the pages here-on.

They are the result of our constant research in providing an effective and safe method of performing inhalation therapy.



Nebula

All-in-one compressor aerosol unit for the full family

Nebula is the result of **30 years in scientific research and technology** in order to guarantee professional products with a **specific therapeutical action**.

Each component part is made of shock-resistant material and is designed to make it easy to use, **reliable and safe**, and to **ensure excellent performance** at all times.

Nebula aerosol therapy unit comes with

two special nebulizers that convey the drug straight to the parts to be treated: **Rinowash**, designed specifically for the upper airways, and **Nebula Spacer** for the bronchopulmonary apparatus.

Nebula is equipped with a complete kit containing: Nebula Spacer, Rinowash, paediatric mask, spare air filters and air tubing.

Rinowash

Micronized nasal douche for the treatment of upper airways.
It atomizes particles of an ideal size for treating the nasal cavities.



Nebula Spacer

Nebulizer with volumetric mouth mask.
Increases efficacy of treatment.
Improves bronchial deposition of the nebulized drug.



Please see instructions manual for any additional information

Nebula, at home or even in the hospital, is a professional unit improving the full family's quality life

- Effective: complete treatment of upper and lower airways
- High performance ensuring safe therapy
- Increase of the peripheral deposition
- Reduction of drug dispersal to a minimum
- Reduced therapy time
- Longer durability and higher robustness

TECHNICAL SPECIFICATIONS

Rinowash

MMAD	18 μm (*)
Output rate	2 ml/min

Nebula Spacer

MMAD	1.9 μm
Output rate	0.3 ml/min

Unit

Operation	Continuous
Maximum air pressure	2.7 bar
Maximum air flow	12 l/min
Noise level at 1 m	57 dBA (to UNI EN 13544-1)
Dimensions of the basic unit	230x180x185H mm
Weight of the basic unit	3 kg

(*) The values shown refer to the use of physiological solution (0,9% NaCl) and may vary with the drug used. The values given do not apply to drugs in suspension or high-viscosity drugs. The manufacturer of the drug can provide the necessary details.



MobyNeb

Dual-function compressor aerosol unit specific for children

Mobyneb features **Perfecta** nebulizer with volumetric oro-nasal mask for children but suitable also to adults, as well as **Rinowash**, both successfully used **to treat localized diseases of the lower and upper airways.**

Mobyneb was the first device in Italy to incorporate the innovative concept

of **topical inhalation therapy**, which facilitates drug deposition in the target organ.

Mobyneb is comprised of the following accessories: power unit, Perfecta volumetric mask, Rinowash nasal douche, mouth piece, air tubing and spare air filters.

Rinowash

allows physiological and/or medical treatment of the nasal cavities. A jet of atomized solution helps to enhance hydration and fluidification of the mucus and catarrh, hence their removal. Very useful for babies not yet able to blow their nose.



Perfecta

is especially designed for treating the lower airways of young children. Allows high deposition of the atomized drug.



Please see instructions manual for any additional information

A close-up photograph of a young child's face, focusing on the nose and mouth. A nasal cannula is visible, inserted into the nostrils. The child's eyes are closed, and the overall tone is soft and clinical.

Mobyneb is conceived for very young children (0-3 years). The top quality materials and the specific design make it safe and effective

- Friendly design allowing an easier treatment for children
- Safe and effective treatment of the lower airways
- Increase of the drug deposition where it is needed with reduced side effects
- Reduction of drug dispersal to a minimum
- Reduced therapy time
- Longer durability and higher robustness

TECHNICAL SPECIFICATIONS

Rinowash

MMAD	18 μm
Output rate	2 ml/min

Kit Perfecta

MMAD	1.9 μm
Output rate	0.3 ml/min

Unit

Operation	Continuous
Maximum air pressure	2.7 bar
Maximum air flow	12 l/min
Noise level at 1 m	56 dBA (to UNI EN 13544-1)
Dimensions of the basic unit	320x210x197H mm
Weight of the basic unit	2.9 kg

(*) The values shown refer to the use of physiological solution (0,9% NaCl) and may vary with the drug used. The values given do not apply to drugs in suspension or high-viscosity drugs. The manufacturer of the drug can provide the necessary details.

Soffio Plus Compressor aerosol unit for children and adults

It is extremely **compact** and very **practical**.

Light and small in size, its design has been studied to obtain essential shape and durable casing, **easy to handle and to clean**.

A very practical shoulder bag facilitates any transport needs.

Soffio Plus comes with **Perfecta volumetric oro-nasal mask** specific for children but suitable also to adults and it is used for the treatment of **lower airways diseases**.



Perfecta

volumetric mask for children and adults. Specific for treating diseases of the lower airways. Allows high deposition of the atomized drug.



Ej i Sverige



- Effective treatment of lower airways
- Increase of the peripheral deposition with limited side effects
- Reduction of drug dispersal to a minimum
- Compact, light, stylish design granting ease of handling and cleaning
- Shoulder bag included

TECHNICAL SPECIFICATIONS

Kit Perfecta	
MMAD	1.9 μm
Output rate	0.3 ml/min

Unit	
Operation	Continuous
Maximum air pressure	2.5 bar
Maximum air flow	12 l/min
Noise level at 1 m	59.3 dBA (to UNI EN 13544-1)
Dimensions of the basic unit	190x130x120H mm
Weight of the basic unit	1.5 kg

(*) The values shown refer to the use of physiological solution (0,9% NaCl) and may vary with the drug used. The values given do not apply to drugs in suspension or high-viscosity drugs. The manufacturer of the drug can provide the necessary details.

Soffio Plus means full comfort at any conditions: it is the ready to use solution helping patients to get their aerosol treatment everywhere



New Voyage

Compressor aerosol unit for "on the way" patients

Innovation and tradition are combined in a device that features a **stylish new design** reflecting the consistently high level of quality of Air Liquide Medical Systems' products.

New Voyage aerosol unit is used for the treatment of **lower airways diseases**.

Ergonomically-designed and easy to carry: portable and ideal for transport.

New Voyage is equipped with: Mefar 2000 nebulizer plus mouthpiece, a paediatric mask, an adult mask, a connecting tube.



Mefar 2000

breath enhanced nebulizer to ensure optimal delivery of the drug.

The micronized particles have the right MMAD (*) to aid deposition in the lower airways.



Please see instructions manual for any additional information

- Effective: adequate bronchial deposition in a short time
- Extremely convenient: very good relation between price and quality
- Handy, lightweight unit simplifies therapy and can be used anywhere, anytime.
- Accessories compartment made of smooth, non-porous material for easy cleaning.

TECHNICAL SPECIFICATIONS

Kit Mefar 2000

MMAD	2.1 μm
Output rate	0.3 ml/min

Unit

Operation	Continuous
Maximum air pressure	2.5 bar
Maximum air flow	10 l/min
Noise level at 1 m	57.3 dBA (to UNI EN 13544-1)
Dimensions of the basic unit	207x285x107H mm
Weight of the basic unit	1.5 kg

(*) The values shown refer to the use of physiological solution (0,9% NaCl) and may vary with the drug used. The values given do not apply to drugs in suspension or high-viscosity drugs. The manufacturer of the drug can provide the necessary details.

New Voyage is a convenient and easy aerosol unit with a simple equipment to facilitate the set up of an effective treatment



Valved holding chambers for inhalers

L'espace

Worldwide guidelines recommend the use of the **spacer chamber for the proper treatment of asthma**.

L'espace makes treatment easier and allows

a better coordination between MDI (Metered Dose Inhalers) output and inhalation.

L'espace helps the adequate drug deposition in the lower airways preventing oral deposition and reducing side effects.

Innovative conic shape

Flow dynamics delivers a higher fraction of the drug by increasing the deposition in the lower respiratory tract.

Ideal volumes

L'espace reduces the drug particles reaggregation that occurs in the spacers with smaller volumes.

Bottom lid with adaptive air inlets

Facilitated inspiratory effort and better flow dynamics.

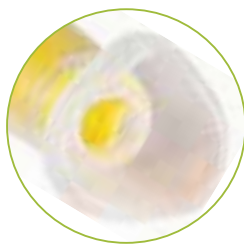


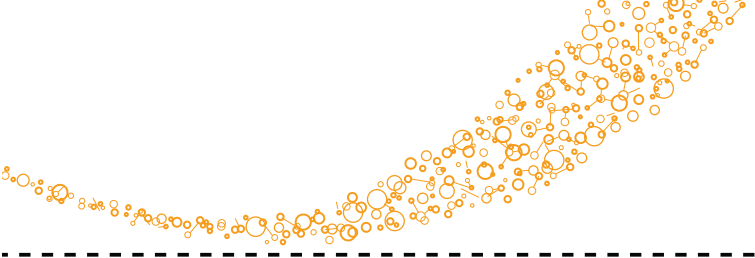
Comfortable anatomical mask

Guarantees high levels of comfort and compliance. Optimal seal to prevent in and out air leaks.

Patented valves system

Efficient feedback of the correct use, simple to synchronise MDI output with breathing acts, easy to count breath.





- Very low triboelectric charging
- Universal MDI (Metered Dose Inhalers) insert
- All models are autoclavable at 121 °C
- Single packed in protective carrying bag and carton box
- Tissue bag supplied for storage and transport
- Longer durability and robustness



■ MOUTHPIECE



■ ADULT MASK (non cooperating)



■ PAEDIATRIC MASK 2-6 years



■ INFANT MASK 0-2 years

L'espace ensures great functionality with reduced risk of errors during treatment, helping patient compliance



Solutions at a glance

Topical therapy:
specific solutions for treating
respiratory pathologies

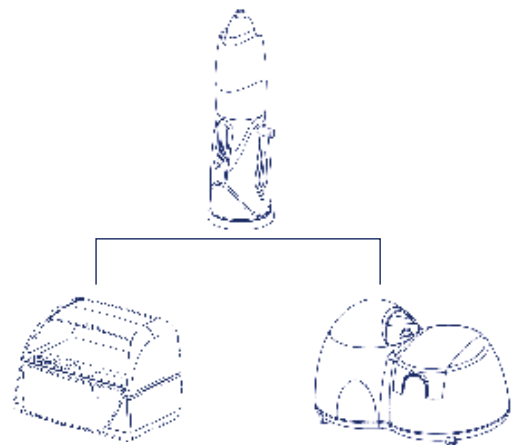
Rinowash

UPPER AIRWAYS

- MMAD 18 μm
- removes secretions, mucus and catarrh
- reactivates mucociliary movement in the nasal cavities
- can be used with natural and drug solutions

For the treatment of:

- rhinitis
- rhino-sinusitis
- nasal polyposis
- adenoiditis
- tubotympanitis



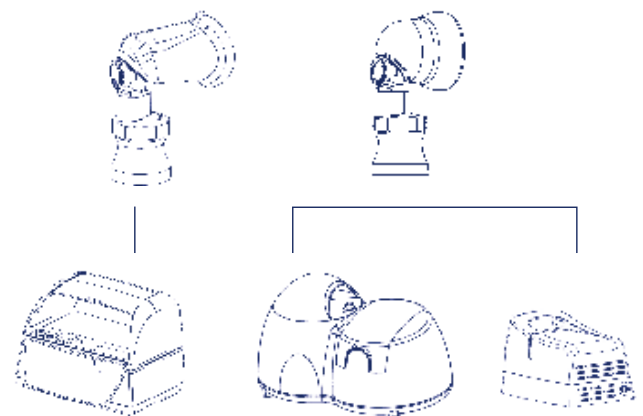
Perfecta and Nebula Spacer

LOWER AIRWAYS

- very small particle size
- specific for brief treatment
- increases peripheral deposition of the drug
- enhances patient compliance, increasing the treatment's effectiveness

For the treatment of:

- bacterial or viral respiratory infections
- asthma
- bronchitis
- pneumonia
- cystic fibrosis



L'espace

LOWER AIRWAYS

- Increase drug deposition and the available inspiratory fraction of the nebulized drug

For the treatment of:

- asthma
- COPD



Upper Airways

- M. Anselmi, A. Ferrara, D. Passali (ORL Clinic, Siena): Micronized Nasal Wash, a modern approach to the treatment of some types of rhinitis. Workshop on Inhalation Therapy VI National Congress on Paediatric Immunology and Allergology – 26/29 October 1994, Brescia.
- D. Passali, L. Bellussi, A. Ferrara Gorga : (ORL Clinic, Siena) The treatment of rhinopathies with atomized nasal douche. Rivista Italiana di Otorinolaringologia Audiologia e Foniatria no. 4 October/December 1995
- A. Varricchio, D. Tricarico, E. Ascione, A.M. Varricchio, G. Barba, M.F. Tripodi, G. Motta: Aerosol therapy vs systemic therapy in upper respiratory tract infections in pediatric age. L'Otorinolaringologia Pediatrica; Vol X, N3-4/1999, 1120-3455
- F. Di Bernardino, F. Scaglione – Department of Pharmacology, Milan University : Nasal Wash Allergia online www.allergiaonline.com
- Diot P. et al.: Proposed guidelines for aerosol therapy by means of nebulizers. Eur Respir Rev 2000; 10:72, 206-209.
- Pisano G. et al: Management of nasal polyposis: Efficacy of intranasal corticosteroid with hypertonic solution. Book of Abstracts of "XVIII of European Rhinologic Society"; Vol 1, 2000, 414-415;
- A. Varricchio, D. Tricarico, A.M. Varricchio, M. Ruosi, G. Motta: Effectiveness of Aerosol Therapy with nasal wash in the treatment of recurrent subacute rhinopharyngitis complicated by acute catarrhal otitis media 2003
- A. Varricchio, M. F. Tripodi, G. Sarnataro, R. Utili, E. Ascione, D. Tricarico: Is aerosol antibiotic delivery better than oral antibiotic treatment for recurrent rhinopharyngitis in paediatric patients? 8th International Congress of Paediatric Otorhinolaryngology 11-14 Sept. 2002
- A. Della Volpe, A.M. Varricchio, A. Varricchio A. De Lucia, N. Mansi: Clinical and bacteriological evaluation of inhaled tobramycin/oral placebo vs amoxicillin/cavulanate-inhaled placebo in bacterial nasurization of paediatric recurrent rhinopharyngitis. Espo 2004 European Society of Paediatric Otorhinolaryngology, 16-19 May 2004 Athens, Greece
- A. Varricchio, D. Tricarico, A. De Lucia, R. Utili, M.

- F. Tripodi, M. Miraglia Del Giudice, M. Capassi, G. Sabatino, M. Sgarella, G.L. Marseglia, G. Ciprandi: Inhaled Tobramycin in children with acute bacterial rhinopharyngitis International Journal of Immunopathology and Pharmacology, Vol. 19, no. 1, 131-139, 2006.
- G. Ciprandi, A. Varricchio, M. Capasso, A.M. Varricchio, A. De Lucia, E. Ascione, F. Awisati, C. Capristo, G.L. Marseglia and U. Barillari Adenoid hypertrophy: an alternative to surgery International Journal of Immunopathology and Pharmacology, Vol. 20, no. 2, 0-0, 2007
Poster presented at the ISAM (International Society for Aerosols in Medicine) Congress, Tours, France – 16-20 June 2007
- Varricchio, M. Capasso, M. di Gioacchino, G. Ciprandi Inhaled Thiamphenicol and Acetylcysteine in children with acute bacterial rhinopharyngitis International Journal of Immunopathology and Pharmacology, Vol. 21, no. 3, 0-0, 2008

Lower Airways

- G. Galli, S. Gianni, A. Di Fazio, E. Brunetti, L. Di Bernardino Comparison of traditional treatment and brief inhalation therapy with salbutamol using a new volumetric mask Published in the "Allergy and Asthma Proceedings"- Poster presented at the EAACI (EUROPEAN ACADEMY OF ALLERGOLOGY AND CLINICAL IMMUNOLOGY) congress in Goteborg, Sweden, 9-13 June 2007
- H. Yuksel, L. Di Bernardino, D. Yuksel, O. Yilmaz, Z. Burak The new volumetric mask increases the effectiveness of inhalation therapy European Annals of Allergy and Clinical Immunology, Vol. 39, no. 2, 2007

L'espace

- Di Bernardino F, Cesarani A, Moles A, Brenna O, The emitted dose of drug from a valved holding chamber using five pressurized metered dose inhalers, International Journal of Drug Delivery, Vol.4 n.3 (2012)
- Di Bernardino F, Forti S, Piatti G, Fasano V. A comparative study of two different metered-dose inhaler-valved holding chambers in the administration of salbutamol, Chest 2010 Feb;137(2):502-3. doi: 10.1378/chest.09-1995.

Air Liquide Medical Systems is part of **Air Liquide's Healthcare** division which supplies medical gases, hygiene products, medical equipment and specialty ingredients.

A dedicated team of 10,000 employees in over 30 countries around the world influence the lives of more than 1,000,000 patients at home and serve over 7,500 hospitals.

The choice of Air Liquide Medical Systems means certainty of quality. All products are entirely "Made in Italy", manufactured with biocompatible materials according to UNI EN directive ISO 10993 and controlled and tested following the most severe trials. Air Liquide Medical Systems is certified:

ISO 14001:2004 Environmental Management Systems
ISO 9001:2008: Quality Management Systems
ISO 13485:2003: Medical devices - Quality Management Systems Requirements for Regulatory Purposes



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Air Liquide Healthcare is a world leader in medical gases, home healthcare, hygiene products and healthcare specialty ingredients. It aims to provide customers in the continuum of care from hospital to home with medical products, specialty ingredients and services that contribute to protecting vulnerable lives.