VTT EXPERT SERVICES LTD

CERTIFICATE No 158/01

Date of issue May 31, 2002 Updated April 25, 2014 Original in Finnish

NAME OF PRODUCT

Uponor Indoor Air System

MANUFACTURER

Uponor Suomi Oy
PL 21
15561 NASTOLA

PRODUCT DESCRIPTION

The ducts and duct parts of Uponor Indoor Air System made on polypropylene are intended to be used in inlet and exhaust air ducts of apartment-specific Indoor Air Systems in one-family, terraced and semi-detached houses. The nominal diameters of the ducts and duct parts are Ø100, Ø125, Ø160 and Ø200mm.

Due to the manufacturing techniques and the material, the ducts and duct parts are antistatic and the inner surfaces are clean, oil-free and even.

CERTIFICATION PROCEDURE

This certificate is based on the testing of the product, inspection of the quality control system and the design and installation information received from the certificate holder.

The general certification procedures are based on the certification system of VTT Expert Services Ltd.

This certificate is valid at furthest April 24, 2019 and the terms of validity are presented in section 15

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REGULATIONS, STANDARDS AND INSTRUCTIONS

1. Regulations and product standards

1.1 According to VTT:s research, the ducts and duct parts of Uponor Indoor Air System meet the following requirements of the Finnish building regulations, when relevant in the use of the system:

D2	Indoor climate and ventilation of buildings, regulations and guidelines 2012
E1	Structural fire safety in buildings, regulations and guidelines 2011, according to chapter 8 of this certificate.
E7	Fire safety of ventilation installations, guidelines 2004, according to chapter 8 of this certificate
SFS 3543	Ventilating sheet metal ducts. Strength and air tightness 1987. 2. edition according to the chapter 7 of this certificate
RT 07-10741	Indoor air classification (Sisäilmastoluokitus) 2000. Rakennustietosäätiö RTS. 2001, according to the chapter 10 of this certificate
ISO 5221	Air distribution and diffusion-Rules to methods of measuring air flow rate in an air handling duct
CEN instruction N 472 REV A.	Experimental determination of mechanical energy loss coefficient of air handling components, August 1998

2. Other standards and instructions

2.1 The manufacturer of the product has declared that the following guidelines and standards will be followed:

IEC 61340-4-10: Standard test methods for specific applications – Two-point resistance measurement (antistatic of channel system)

SFS EN ISO 9001, Quality management systems. Model for quality assurance in design or product development, production, installation and in after delivery services.

EN ISO 14001, Environmental management systems. Requirements with guidance for use.

FDS- fire simulating program (Research report VTT-S-12299-06)

PRODUCT INFORMATION

3. Product description, marking and quality control

3.1 The ducts and duct parts of Uponor Indoor Air System made of polypropylene are intended to be used in inlet and exhaust air ducts of apartment-specific Indoor Air Systems in one-family, terraced and semi-detached houses. The nominal diameters of the ducts and duct parts are Ø100, Ø125, Ø160 and Ø200mm.

3.2 The ducts, which are black, are marked at one meter intervals with the product name Uponor indoor air duct, the size and length (3000 mm) of the duct, material marking (PP), information of the production time, production site mark, number of the machine, VTT 158/01, SITAC type approval number and mark, SITAC accreditation number, bar-code and EAN code.

The insulated duct is marked on the insulation, Uponor-preinsulated indoor air duct, the size and length (3000 mm), recycling mark, material marking (PE).

The black duct parts are marked with sign Uponor, the name and code of product, material marking, recycling mark, and the information of production time and lot.

The insulated duct parts are marked with the stamped text, Uponor indoor air and the size.

The plastic bags of the duct parts have a sticker with the product name, bar-code and EAN-code

3.3 The antistatic of the products is confirmed during the production according to the standard IEC 61340-4-10: Standard test methods for specific applications –Two-point resistance measurement.

3.4 The manufacturer's internal quality control is performed according to the quality control instructions of Uponor Suomi Oy.

3.5 The manufacturer has certified quality management system according to standard SFS-EN ISO 9001 and environmental management system according to standard SFS-EN ISO 14001.

3.6 The external quality control of the ventilation ducts and duct parts is performed by VTT Expert Services Ltd according to the valid quality control agreement. The surveillance includes inspection of internal quality control, sampling and testing of samples with the extent defined in the agreement.

4. Delivery and storage on site

4.1 The ducts are delivered in three meter long sections, with plugged ends. The duct parts are delivered packed in plastic bags.

4.2 When stored, the shield plug shall be in place and the parts in the plastic covering bags. In long term storage the ducts and duct parts shall be protected from straight sun light.

DESIGN INFORMATION

5. General

5.1 The design information given in this certificate is based on the assumption that structural solutions, fastening methods and other basic information are according to this certificate and that the requirements, instructions and standards are followed.

6. Installation

6.1 The ducts and duct parts are installed, connected to each other, insulated and encapsulated according to the instructions given by the manufacturer. The joint is made pursing by hand. No screws or rivets is needed to use in the joints.

6.2 The ducts can be cut by an ordinary fine toothed saw.

6.3 The duct should not be thrown, dragged or bruised. It is not recommended to install the ducts in temperatures under -15 °C.

6.4 The ducts and duct parts shall be protected from getting dirty in intermediate storing during installation.

6.5 The maximum allowed support distance is 1500 mm and the supports are installed so that there is a support close to each joint/part.

7. Structural performance

7.1 The ducts fulfil, if installed according to the directions (maximum support gap is 1500 mm), strength requirements of standard SFS 3543.

7.2 The ducts and duct parts fulfil the tightness requirements of class D of the standard SFS 3543.

7.3 The durability for impacts and bruises during installation is taken in account in the installation directions.

8. Fire Safety

8.1 The plastic ducts and duct parts of Uponor Indoor Air System are suitable to be used in inlet and exhaust air ducts of apartment-specific Indoor Air Systems in one-family, terraced and semi-detached houses of the fire class P3 defined in the Finnish Building Code part E1. According to Uponor Indoor Air System installation and design instructions 25.4.2014, a metallic spiral duct according to standard SFS 3282, is used as kitchen stove local exhaust duct. The minimum material thickness of the metal spiral duct is 0,5 mm.

8.2 The ducts and duct parts of Uponor Indoor Air System are installed into attic space of a building, -insulation layer of the roof, -encapsulation, -hollow hung ceiling and/or into vertical chase in accordance with Uponor Indoor Air System installation and design instructions 25.4.2014. Insulation of the ventilation ducts and duct parts shall be done according to design- and installation instructions.

The fire class of the encapsulating- and hung ceiling material shall be at least D-s2,d2
The fire resistance of kitchen stove local exhaust duct at the attic and attic cavity shall be at least EI 30.

8.3 The fulfilment fire safety requirements of Uponor Indoor Air System has been shown according to Finnish Building Code part E1 chapter 1.3.2.

Simulation of a fire incident is made with FDS-fire simulation program. The spreading of fire and smoke and the effect of the ventilation duct to the fire are examined by calculations, in a case when the ducts are installed in encapsulations which fulfil the classification requirements of fire regulations. A comparison was made to the operation of a ventilation duct with D classified materials and corresponding construction, dimensions and installation method.

9. Durability

9.1 The thermal resistance of the ducts is in continuous use -50 °C - +85 °C. The recommended minimum installation and handling temperature is -15 °C.

10. Environmental aspects

10.1 The material of ducts and duct parts fulfil the requirements of the emission class M1 of construction materials in Indoor air classification (Sisäilmastoluokitus) 2000.

INSTRUCTIONS FOR INSTALLATION AND USE

11. Manufacturer's instructions

11.1 The installation and maintenance of the duct system is performed according to the Uponor Indoor Air System installation and design instructions 25.4.2014.

TECHNICAL ASSESSMENT

12. Testing and calculations for this certificate

12.1 The following properties of the ducts and duct parts have been defined at VTT:

- Tightness
- Pressure losses (diagrams)
- Fire behaviour with calculations
- The emissions provided by the emission class of the material.

13. Other material

13.1 The manufacturer's installation and design instructions of Uponor Indoor Air System 25.4.2014.

13.2 The tests and investigations by VTT, University of Kuopio and Helsinki University of Technology concerning the contamination, clean ability and susceptibility to moulding of the duct system.

13.3 The quality control instructions of the manufacturer.

13.4 The raw material supplier's report of applicability of the material for food use.

VALIDITY OF THE CERTIFICATE

14. Validity period of the certificate

This certificate is valid at furthest until April 24, 2019.

The validity of the certificate will be ended, if European technical approval or assessment, ETA, has been applied and issued to the system or the transition time of harmonized product standard has passed.

15. Conditions of validity

The certificate is valid assuming that no fundamental changes are made to the product, and that the manufacturer has a valid quality control contract. A list of valid certificates is available from VTT Expert Services Ltd.

16. Other conditions

The references made in this certificate to publications in the National Building Code of Finland and standards are valid in the form used at the time the certificate was issued.

The recommendations in this certificate concerning safe use of the product are minimum requirements that shall be met when using the product. The certificate does not override current or future requirements imposed by act or decree. In addition to what is specified in this certificate, good general building practice shall be observed in the design, manufacture and use of the product.

The manufacturer is in charge of the product's quality and factory production control. In issuing this certificate, VTT Expert Services Ltd does not bind itself to indemnification liability concerning personal injury or other damage that may directly or indirectly result from using the product described in this certificate.

VTT Expert Services Ltd finds the plastic ducts and duct parts of Uponor Indoor Air System to be suitable for use in construction as described in this certificate. This updated certificate no 158/01 has been awarded as described above to Uponor Suomi Oy.

On behalf of VTT Expert Services Ltd April 25, 2014

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