

# Use and Maintenance Manual



## Chem-proof roof fans

## SMART-CHEM

### Contents:

1.	Introductory Remarks .....	2
2.	Application.....	2
3.	Reservations of Producer.....	3
4.	Technical Data .....	3
5.	Structure and Function .....	5
6.	Assembly and Start-up.....	5
7.	Operational Use.....	6
8.	Troubleshooting Guide .....	7
9.	Maintenance .....	7
10.	Occupational Health and Safety.....	7
11.	Transport and Storage .....	8
12.	Terms of warranty .....	8
13.	Table of resistance of PVC against various substances .....	9
14.	Sample of the Declaration of Conformity .....	13

802W00	SMART-CHEM-160/1500	31.05.2019/EN
802W01	SMART-CHEM-200/1500	31.05.2019/EN
802W02	SMART-CHEM-250/1500	31.05.2019/EN
802W03	SMART-CHEM-315/1500	31.05.2019/EN
802W04	SMART-CHEM-400/1000	31.05.2019/EN
802W05	SMART-CHEM-500/1000	31.05.2019/EN

## 1. Introductory Remarks

The purpose of the present Use and Maintenance Manual is to supply User with directions within the range of application, installation, start-up and the use of the **SMART-CHEM chem-proof roof fans**.

**Installing, start up and operational use are exclusively admissible after getting acquainted with the contents of the Use and Maintenance Manual.**

With regard to continuity of work carried on improvement of our products, we reserve for ourselves the revision possibility of the draft and technological changes improving their functional features and safety.

The construction of the **SMART-CHEM chem-proof roof fans** meets the requirements of the current state of technology as well as the safety and health assurances included in:

- **2006/42/EC Machinery Directive** of the European Parliament and of the Council of May 17<sup>th</sup>, 2006 on machinery – amending the 95/16/EC (recast) /*Journal of Laws EC L157 of 09.06.2006, page 24/*
- **2014/35/EC Directive** of the European Parliament and of the Council of February 26<sup>th</sup>, 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits. /*Journal of Laws EC L96 of 29.03.2014/*

The appliance meets the requirements included in:

- **2009/125/EC (ErP) Directive** of the European Parliament and of the Council of October 21<sup>st</sup>, 2009 establishing a framework for the setting of ecodesign requirements for energy-related products / *Journal of Laws L 285 of 31.10.2009 /*
- **327/2011 (EU) Regulation** of March 30<sup>th</sup>, 2011 on implementing the **2009/125/EC Directive** of the European Parliament and of the Council with regard to ecodesign requirements for fans driven by motors with an electric input power between 125W and 500 kW / *Journal of Laws L No. 90 of 06.04.2011 /*

Additionally, the appliance meets following harmonized standard:

- |                                      |   |
|--------------------------------------|---|
| • <b>EN ISO-12100:2012</b>           | – “Safety of machinery – Basic concepts, general principles for design. Risk assessment and risk reduction” |
| • <b>EN 60204-1:2018-12</b>          | – “Safety of machinery – Electrical equipment of machines. Part 1: General requirements”.                   |
| • <b>EN 60034-1:2011</b>             | – “Rotating electrical machines – Part 1: Rating data and parameters”                                       |
| • <b>EN ISO 5802:2008/A1:2015-07</b> | – “Industrial Fans – Performance testing in situ of installing”   |
| • <b>EN ISO 13857:2010</b>           | – “Safety of machinery – Safe distances to prevent hazard zones being reached by upper and lower limbs”     |

## 2. Application

SMART-CHEM chemically resistant roof fans have been constructed for conveying the air, contaminated with chemically aggressive media (see Table, pages 9-12) of maximum dustiness 0,3 g/m<sup>3</sup> and maximum temperature up to 40°C. On demand, are available fans of maximum temperature of the forwarded air: up to +60°C.

**These fans cannot convey explosive mixtures.** They are designed for general ventilation of rooms and are applied in ventilation systems in industry, agriculture, building construction, as well as in public facilities such as: laboratories, store houses, hospitals, schools, canteens, swimming pools, sewage treatment plants, etc.

The fans carry hygienic certificates issued by National Institute of Public Health of the Department of Communal Hygiene.

### 3. Reservations of Producer

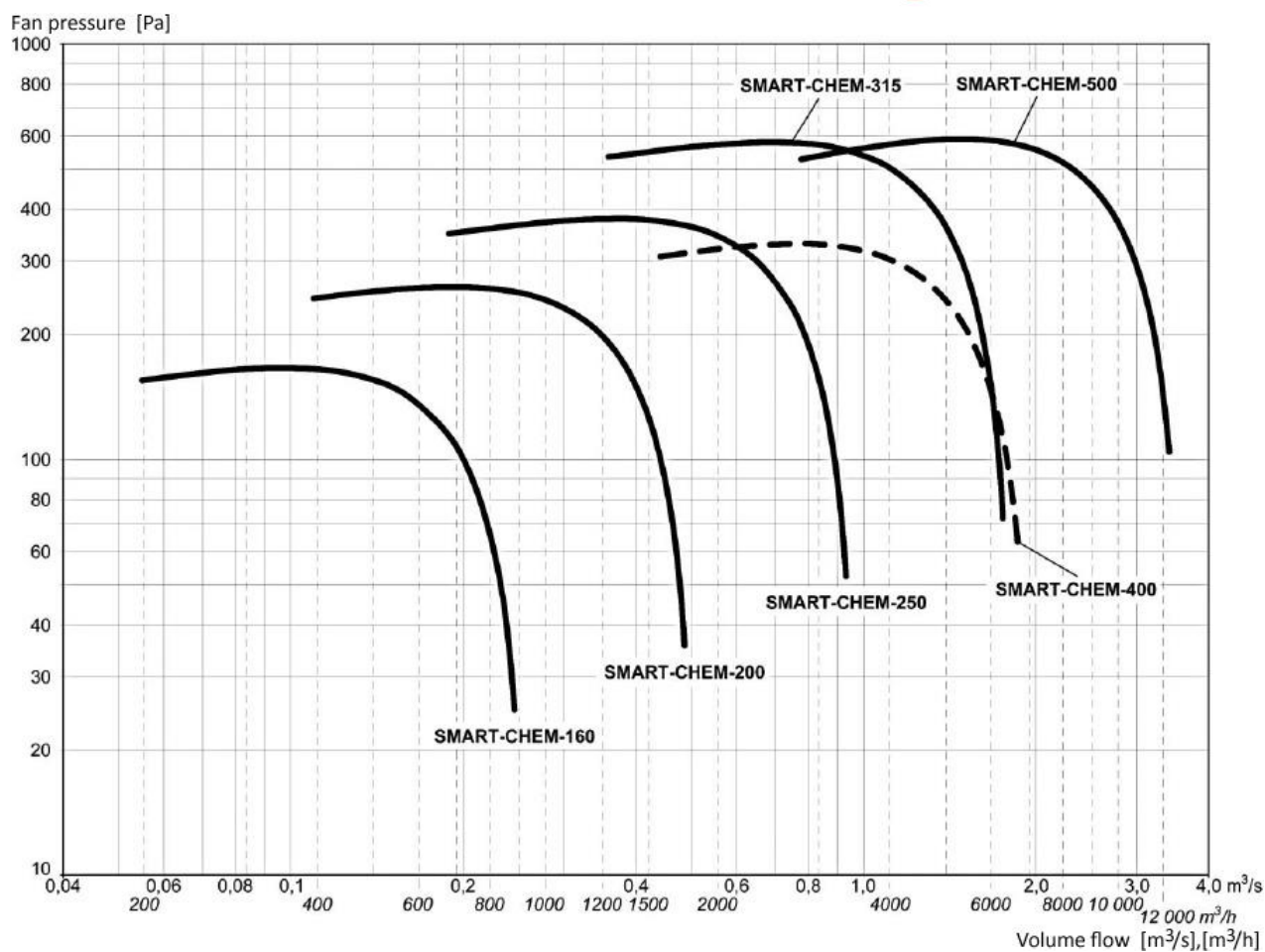
- A. Manufacturer accepts no liability for any consequences following from the operational use that is in contradiction to the purpose of application.
- B. Installing of any additional elements not belonging to the normal device structure (or accessory set) is not acceptable.
- C. Do not undertake any structural changes or constructional modifications on the device on one's own.
- D. Protect the appliance's housing from mechanical damage.
- E. Prior to installing check the load carrying capacity of the building structure where the device will be mounted. Unsure mounting could cause hazard to personnel/people in vicinity and effect in damage of the device.
- F. **The fan cannot be used for conveying the air contaminated with a mixture of flammable substances in form of: gas, vapour, mist and dust, that in connection with the air could create the explosive atmosphere.**
- G. **Do not use the fan for conveying the air containing viscous impurities that could accumulate on the device surface, especially on the impeller.**
- H. During operation, the maximum impeller rotations should not exceed the nominal rotations.
- I. Producer is not responsible for wounds, injuries, body laceration experienced by User or personnel during the improper operational use.

### 4. Technical Data

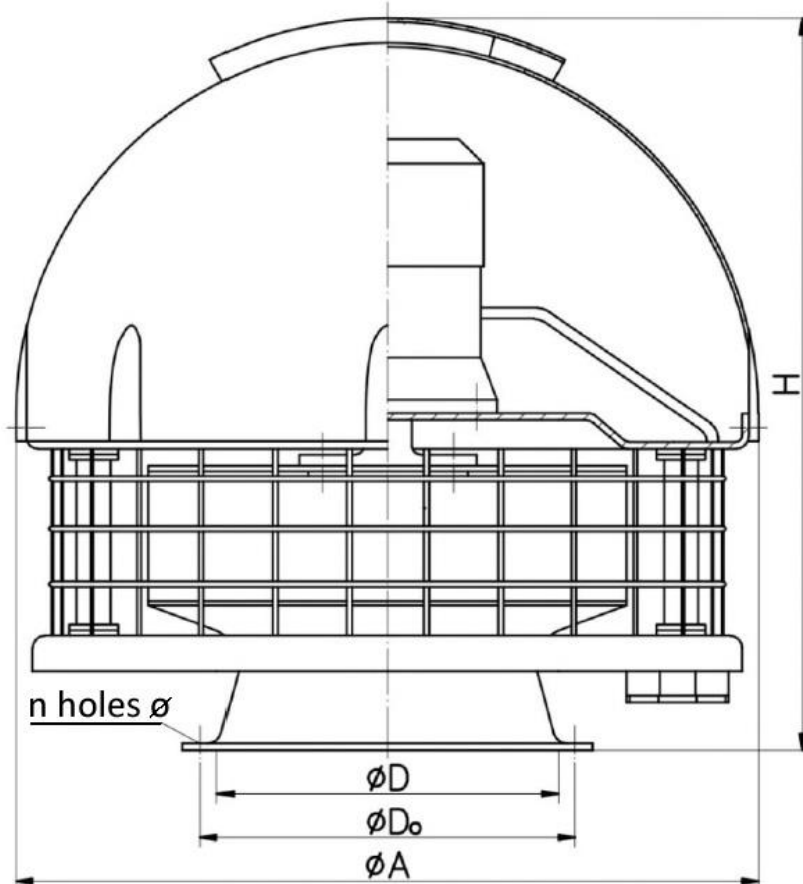
Table No.1

Type of the fan	Synchro- nous rotations	Supply voltage	Motor rate	Maximum Volume flow	Maximum vacuum	Acoustic pressure level from distance		Weight
						1m	5m	
	[r.p.m.]	[V]	[kW]	[m³/h]	[Pa]	[dB (A)]		[kg]
<b>SMART-CHEM-160/1500</b>	1500	3x400	<b>0,12</b>	880	160	59	50	9,2
<b>SMART-CHEM-200/1500</b>	1500	3x400	<b>0,18</b>	1650	250	66	57	10,8
<b>SMART-CHEM-250/1500</b>	1500	3x400	<b>0,37</b>	3300	380	72	63	14,1
<b>SMART-CHEM-315/1500</b>	1500	3x400	<b>0,75</b>	6250	580	75	66	22,8
<b>SMART-CHEM-400/1000</b>	1000	3x400	<b>0,55</b>	6600	330	70	61	33
<b>SMART-CHEM-500/1000</b>	1000	3x400	<b>1,5</b>	12400	590	76	67	70

- Ingress protection IP 55
- Maximum temperature of the conveyed air is +40°C. Fans of special execution are adapted for function in temperature +60°C.
- Maximum dustiness of the conveyed air is 0,3 g/m³.
- On demand are available fans of special execution for supply voltage 1 x 230V.



**Fig. No.1 – Flow charts of the fans type SMART-CHEM**



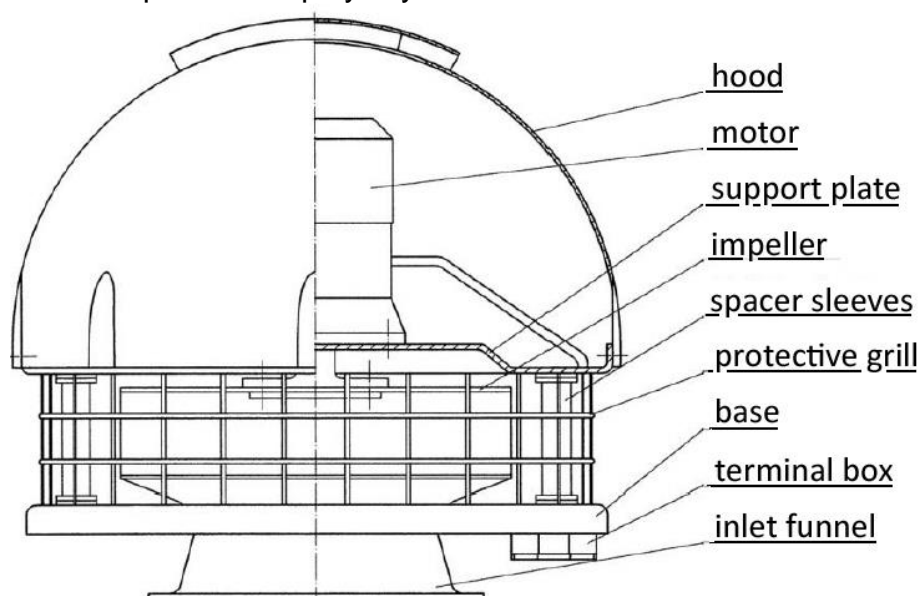
**Fig. No.2 – Dimensions of the fans type SMART-CHEM**

**Table No.2 – Dimensions of the fans type SMART-CHEM [dimensions in mm]**

Type of the fan	D	D <sub>o</sub>	A	H	n	ø
<b>SMART-CHEM-160/1500</b>	160	184	418	421	8	7
<b>SMART-CHEM-200/1500</b>	200	224	476	460	8	7
<b>SMART-CHEM-250/1500</b>	250	274	548	506	8	7
<b>SMART-CHEM-315/1500</b>	315	339	660	615	8	7
<b>SMART-CHEM-400/1000</b>	400	432	802	667	12	10
<b>SMART-CHEM-500/1000</b>	500	573	976	837	16	15

## 5. Structure and Function

The structure of the SMART-CHEM fan is illustrated in Fig. No.3. Impeller is a welded construction, of non-plasticised plates of polyvinylchloride. To the fan impeller is fastened an aluminium hub that is connected with the motor pivot. The motor is installed on a support plate, extruded of the non-plasticised polyvinylchloride with a bent outwards collar.


**Fig. No.3 – Structure of the fans type SMART-CHEM**

The supporting plate is connected with the fan base by means of spacer sleeves. The fan base is extruded of the non-plasticised polyvinylchloride and its flange is bent outwards. To the base plate is welded an inlet funnel (confusor), providing an even distribution of the conveyed medium onto the impeller. The inlet funnel is also made of a plate of the non-plasticised polyvinylchloride.

The motor shield protects against atmospheric factors (material: non-plasticised polyvinylchloride). The motor is mounted on the supporting plate and is adapted for work in vertical position. To energize the motor is applied a terminal box, fastened at the fan base. As a circumferential structure, there is a steel wire protective grill, to prevent the rotary elements from being touched by operator.

On demand, we deliver isolating switches, to cut off the power supply during the installing, servicing (see catalogue card "Electrical Accessories").

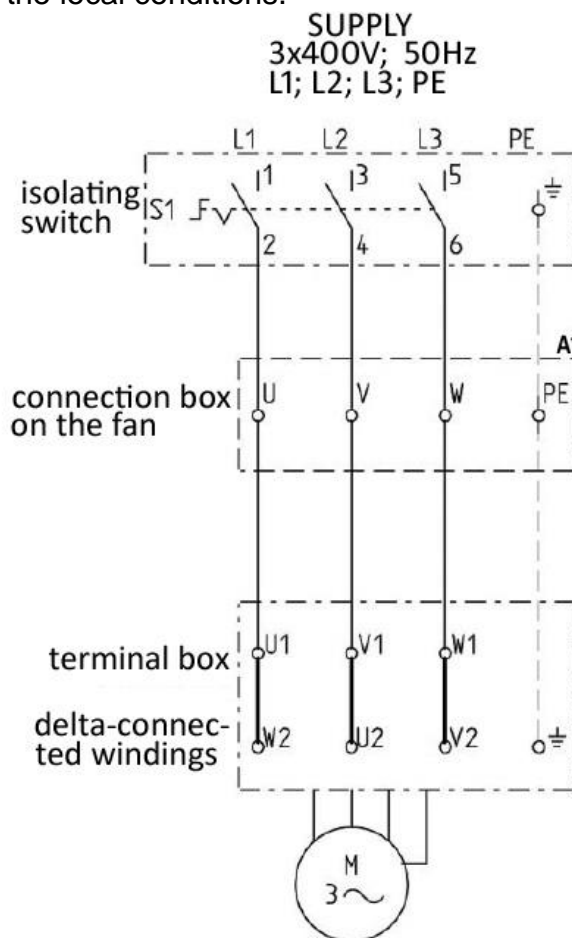
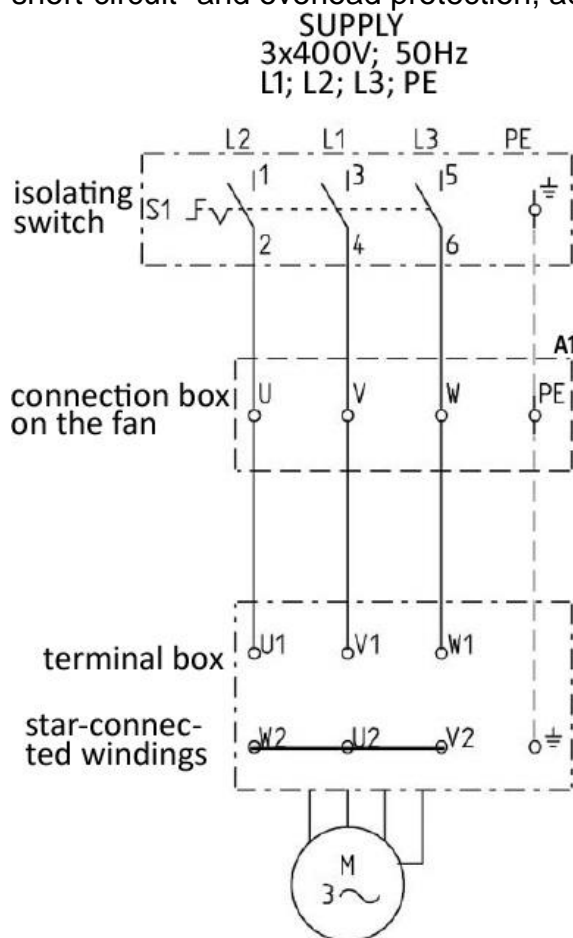
## 6. Assembly and Start-up

The fan is designed for application outside the industrial rooms. According to manufacturer it is advised to install the fan on a roof base or on a wall bracket (delivery on separate order). Prior to installing, examine if the delivered device did not get damaged or polluted during the transport.

**Before the connection to the power supply, make sure whether the parameters of the existing electrical installation are in uniformity with the data on the nominal plate. In case of inconsistency the connection cannot be executed.**



Connection to the electrical power system has to be executed by User on one's own by selecting the right type and section of the supply cable, and choosing the appropriate short-circuit- and overload protection, according to the local conditions.



**Caution:**

1. Overload protection has to be selected by investor
2. It is suggested to install the S1 isolating switch close to the fan
3. Insulation class I

**Fig. No.4 – Connection diagram of the fans type SMART-CHEM**

**WARNING**

Connection to the power supply system has to be carried out by a qualified person, according to the valid regulations and information introduced in Fig. No.4.

Prior to the start-up, check the connection between the motor and the PE protective cable, and the correctness of the electrical connections. **The impeller rotation sense ought to be according to the arrow on the housing, in case of incompatibility change the phase connection sequence (3-phase motors only).** Before the first start-up, check the correctness of the connections between the fan and the ventilation duct. Additionally, check if there are some pollutants / foreign objects in the fan or ventilation ducting.

## 7. Operational Use

The construction do not require any additional maintenance after the start-up. If the place of operational use is changed – repeat the steps according to installing and adapting the ventilation system to the new application and conditions (see Section 6 of the present Use and Maintenance Manual). In case when any symptoms of incorrect work of the device are noticed, (not typical noises or visually), follow steps as in Section 8.

## 8. Troubleshooting Guide

Table No.3

	Problem	Possible reason	Corrective action
1.	Sudden vibrations of the fan are occurring	Obstacle objects reducing the air the air flow got stuck at the impeller	Disconnect the fan from the power supply system and remove the obstacle
		The impeller is defective.	Replace the impeller with motor for a new one.
2.	Noisy work of the fan along with decreased flow efficiency	Incorrect impeller rotation sense.	Change the impeller rotation sense by changing the phase connection sequence (three-phase fans only).
3.	Noisy work of the fan along with small volume flow	The impeller is not balanced or the motor bearings are damaged	Submit the impeller to balancing one more time or replace the motor bearings

## 9. Maintenance

In the aspect of operational use, the fan construction guarantees its efficient function without continuous everyday technical supervision. Nevertheless, during the operation carry out the routine maintenance steps.

Once a year submit the fan to technical revision – the electrical motor ought to be examined according to the instructions of the motor manufacturer.

Every several years, check the mechanical and electrical connections. The electrical installation ought to be checked according to the standard PN-HD 60364-6 “Low-voltage electrical installations – Part 6: Verification”.

Moreover, if any defective function of the unit or failure is noticed – undertake its additional control.



**Any maintenance activities ought to be performed exclusively by an authorised person with qualifications and after disconnection from the power supply system.**

## 10. Occupational Health and Safety

**Start-up and the operational use of the fan are admissible after getting acquainted with the contents of the present Use and Maintenance Manual.** The fan shall not cause any hazard under the condition it is correctly and firmly installed within the ventilation system or to the supporting structure.

Any installation activities related to the power supply system, have to be carried out strictly according to the enclosed Connection Diagram and in accordance with the instructions given in Section 6 of the present Use and Maintenance Manual.



**Connection to the power supply system ought to be carried out by an authorised person with qualifications, according to the being in force regulations. The fan motor must be protected from the short-circuit and overload effects.**

**In the course of operational use, examine the fan connection to the PE protective cable. Any revision activity and repair must be executed after the fan is disconnected from the power supply system (isolating switch).**

## 11. Transport and Storage

For the transport time the fan should be protected against damage (indentation, crack, etc.). Use special transporting eyes/handles (on the motor housing), in order to displace or lift. The device ought to be stored in dry rooms and in areas of efficient ventilation.

## 12. Terms of warranty

The period of warranty for the purchased device is indicated in the “Card of Warranty”. The warranty does not comprise:

- mechanical damages and malfunctions caused by User,
- device failures caused during use which was in contradiction with the purpose of application and with the present Use and Maintenance Manual,
- any damages being caused during improper transport, storage or incorrect maintenance.

Infringement of the Clause G Section 3 “Reservations of Producer” of the present Use and Maintenance Manual and especially modifications undertaken by User on one’s own or use in contradiction with the purpose of application – shall result in the loss of warranty validity.



### 13. Table of resistance of PVC against various substances

Environment	Concentration %	40°C	60°C
Acetone	10	--	--
Pure amyl alcohol		++	o
Ethyl alcohol (ethanol)	10	++	+
Non-fermentative isopropyl alcohol	70 - 99	+	
Methyl alcohol (methanol)	96	++	–
Methyl alcohol (aqueous solution)	100	++	+
Ammonia, aqueous solution	50	++	+
Potassium nitrate, aqueous solution	saturated	++	++
Sodium nitrate, aqueous solution	saturated	++	++
Calcium nitrate, aqueous solution	saturated	++	++
Benzene	100	--	--
Painter's naphtha, mineral spirit		++	+
Liquid butane	100	++	
n-butanol (butyl alcohol)	100	++	o
Liquid chlorine	100	--	
Dry gaseous chlorine	100	--	
Potassium chlorate	7,3	++	o
Sodium chlorate, aqueous solution	25	++	++
Ammonium chloride, aqueous solution	all	++	++
Zinc chloride		++	++
Ethylene chloride	100	--	--
Methyl chloride	100	--	--
Potassium chloride, aqueous solution	saturated	++	++
Sodium chloride, (domestic salt) aqueous solution	saturated	++	++
Sodium chloride, aqueous solution	5	++	++
Chlorobenzene	100	--	--
Cadmium cyanide		+	+
Copper cyanide		+	+
Potassium cyanide		+	+
Mercuric cyanide		+	+
Sodium cyanide		+	+
Silver cyanide		+	+
Cyclohexane	100	++	o
Cyclohexanol	100	++	–
Cyclohexanon	100	--	--
Carbon tetrachloride	100	--	--
1,4-dioxane	100	--	--
Carbon disulphide	100	--	--
Sulphur dioxide	saturated	++	++
Ethyl ether	100	--	
Petroleum ether	100	++	+
2-etylohexanole	100	++	+
Phenol, aqueous solution	approx. 9	o	--
Formaldehyde	40	++	
Formalin	10	++	

Environment	Concentration %	40°C	60°C
Ammonia phosphate	all	++	++
Glycerine	100	++	++
Glycol	100	++	++
Heptane	100	++	
Izopropanol	100	++	
Chromium bath, technical		++	o
Methyl-ethyl ketone	100	--	--
Cresols	100	--	--
Accumulator acid (H <sub>2</sub> SO <sub>4</sub> )		++	++
Nitric acid	10 / 50	++ / ++	++ / ++
Boric acid	100	++	++
Hydrocyanic acid		+	
Citric acid	saturated	++	++
Hydrofluoric acid	8 - 50	+	--
Phosphoric acid	50 / 85	++ / ++	++ / ++
Lactic acid, aqueous solution	90	++	++
Formic acid	10 / 50	++ / ++	+ / +
Formic acid	98	+	
Acetic acid, icy	100	o	--
Acetic acid, aqueous solution	50	++	-
Oleic acid	100	++	o
Sulphuric acid	3-50 / 96	+ / o	+ / --
Sulphuric acid	50 / 10	++ / ++	++ / ++
Hydrochloric acid	35	++	+
Stearic acid	100	++	+
Oxalic acid	saturated	++	++
Acidic sodium carbonate, aqueous solution	saturated	++	++
Acidic sodium sulphate, aqueous solution	saturated	++	++
Nail lacquer		o	
Lysol		-	--
White liquor (12,5% of the active chlorine)		++	o
Potassium lye	10 / 50	++ / ++	++ / ++
Potassium permanganate, aqueous solution	saturated	++	+
Hydrogen peroxide	30	++	
Naphthalene	100	o	--
Nitrobenzene	25 / 100	++ / --	++ / --
Table vinegar		++	++
Butyl acetate	100	--	--
Ethyl acetate	100	--	--
2-butoxyethyl acetate		+	
Edible vegetable oil		++	++
Edible animal oil		++	++
Coconut oil		++	++
Linseed oil		++	+
Olive oil		++	++
Paraffin oil	100	++	++

Environment	Concentration %	40°C	60°C
Soybean oil		++	++
Turpentine oil		++	0
Transformer oil		++	
Mineral oils (without aromatic hydrocarbons)		++	+
Furnace oils		++	0
Silicone oils		++	
Engine oils, car oils		++	+
Pine oil	100	++	
Vapours of ethoxyl amines		--	--
Vapours of chlorides		+	
Vapours of ferrous chloride FeCl <sub>2</sub>	20	+	
Vapours of acetic acid		++	
Vapours of hydrochloric acid	30	+	
Vapours of oxy-oxygen fatty alcohols		+	
Vapours of orange oils		--	--
Vapours of poly-glycols		+	
Vapours of ammonia soda (soda ash) and of caustic soda		++	
Vapours of tio-urea		+	
Vapours of aliphatic hydrocarbons		+	
Gaseous ozone		++	
Automotive fuel (normal petrol)		++	+
Automotive fuel (petrol super)		-	--
Automotive fuel (diesel oil)		++	+
Paraffin	100	++	--
Beer		++	++
Brake fluid		++	++
Anti-freeze fluid (di-ethylene glycol)		++	++
Sodium hypochlorite, aqueous solution	5	++	
Liquid propane	100	++	
Cresol solution		-	--
Soap solution	saturated	++	++
Mercury	100	++	++
Rum	40	++	++
Potassium sulphate, aqueous solution	saturated	++	++
Sodium sulphate, aqueous solution	saturated	++	++
Sodium sulphide, aqueous solution	saturated	++	++
Sodium sulphite, aqueous solution	saturated	++	++
Hydrogen sulphide	saturated	++	++
Pitch (tar)		++	++
Lemon juice		++	++
Brine (leach)	saturated	++	++
Dry salt		++	++
Agent for dishwashing, liquid		++	++
Tetra-chlor-ethane	100	--	--
Tetra-chlorethylene (per-chlorethylene)	100	--	--
Tetra-hydrofurane	100	--	--



Environment	Concentration %	40°C	60°C
Sodium tio-sulphate (fixative)	saturated	++	++
Toluene	100	--	--
Chlorinated lime		+	
Potassium carbonate, aqueous solution	saturated	++	
Sodium carbonate, aqueous solution	saturated	++	++
Water	100	++	++
Chlorinated water	saturated	+	
Aqua regia (nitro-hydrochloric acid)		+	
Seawater		++	++
Sodium hydroxide	50	+	+
Sodium hydroxide (caustic soda)	100	++	++

++	resistant
+	conditionally resistant with the occurrence hazard of tensioning stress cracks
0	conditionally resistant
–	low resistant
--	not resistant

## 14. Sample of the Declaration of Conformity

**Declaration of conformity EC No. ....**

Manufacturer (eventually the authorized representative / importer):

name: **KLIMAWENT S.A.**

address: **81-571 Gdynia, Chwaszczyńska 194**

A person, authorized for issuing the technical documentation: Teodor Świrbutowicz, KLIMAWENT S.A.

hereby declares that the appliance:

name: **chem-proof roof fans**

type/model: **SMART-CHEM**

serial number: ..... year of production: .....

meets the requirements of the subsequent European Directives:

- **2006/42/EC Machinery Directive** of the European Parliament and of the Council of 17 May, 2006 on machinery – amending the 95/16/EC (recast) /*Journal of Laws EC L157 of 09.06.2006, page 24*/
- **2014/35/EC Directive** of the European Parliament and of the Council of 26 February, 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits. /*Journal of Laws EC L96 of 29.03.2014*/

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- |                                      |  |
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| • <b>EN 60204-1:2018-12</b>          | – “Safety of machinery – Electrical equipment of machines. Part 1: General requirements”.                    |
| • <b>EN 60034-1:2011</b>             | – “Rotating electrical machines – Part 1: Rating data and parameters”  |
| • <b>EN ISO 5802:2008/A1:2015-07</b> | – “Industrial Fans – Performance testing in situ of installing”  |
| • <b>EN ISO 13857:2010</b>           | – “Safety of machinery – Safe distances to prevent hazard zones being reached by upper and lower limbs”.     |

.....  
place, date

.....  
signature of authorised person

.....  
name, surname, function  
of the signatory

**KLIMAWENT S.A.**

**Supported Employment Enterprise**

81-571 Gdynia, ul. Chwaszczyńska 194

phone: +49 58 829 64 80

email: [klimawent@klimawent.com.pl](mailto:klimawent@klimawent.com.pl)

[www.klimawent.com.pl](http://www.klimawent.com.pl)

District Court Gdańsk-Północ

in Gdańsk, VII Wydział Gospodarczy

of the National Register of Court

KRS 0000308902 company stock

13.779.200 zł paid in total

NIP: 958 159 21 35

REGON: 220631262

Bank Account: **Santander Bank Polska S.A.**

56 1500 1025 1210 2007 8845 0000



## NOTES:

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**NOTES:**