

# Certificate of Conformity

## Huizhou Lexuslance Technology Co.Ltd

Phase I Plant, EilingXiechang Company, Wuyi Village, Chenjiang Sub-district Office, Zhongkai High-tech Zone, Huizhou City, Guangdong Province, China.

The following products have been tested by us with the listed standards and found in compliance with the European Community Directive (EU) 2016/425 Assessment of compliance of the product with the requirements relating to was based on the following standards:

**EN 149:2001 +A1:2009**

Product: **KN95 Protective Mask**

Model No.: **LK-003**

Parameters: **FFP2**

The statement is based on a single evaluation of one sample of above mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab. Logo.

The manufacture should ensure that all product in series production are in conformity with the product sample detailed in this report. The applicant should hold the whole technical report at disposal of the competent all the right.



After preparation of the necessary technical documentation as well as the conformity declaration the required CE marking can be affixed on the product.

Other relevant directives have to be observed.

Marks Licence No.: ACT20031611  
Ref. Test Report: 68.5.13.10.2800.2890  
Issued Date: 2020-03-16



Steve L  
Chief Director

Approved by: ACT Testing Technology Co., Ltd.  
Tel:(86)020-82317089 Fax:(86)020-82317089  
Website: [www.act-ce.com](http://www.act-ce.com) Email:[info@act-ce.com](mailto:info@act-ce.com)



No. FZ2002401A



中国认可  
国际互认  
检测  
TESTING  
CNAS L0153



# 检测报告

## TEST REPORT

委托方	惠州市雷克兰士科技有限公司
生产单位	惠州市雷克兰士科技有限公司
样品名称	KN95 级防护抗菌口罩
型号规格	---
检测类别	委托检测



广东产品质量监督检验研究院

GUANGDONG TESTING INSTITUTE OF PRODUCT QUALITY SUPERVISION

广东产品质量监督检验研究院  
GUANGDONG TESTING INSTITUTE OF PRODUCT QUALITY SUPERVISION

## 检测报告

## TEST REPORT



报告随机号: NCH1305

第 1 页 共 5 页

样品名称	KN95 级防护抗菌口罩		样品编号	YFZ20/002401
	送样 (√)	抽样 (/)		
商标	---		型号规格	---
委托方	惠州市雷克兰士科技有限公司		检测类别	委托检测
委托方地址	惠州市仲恺高新区陈江大道惠谷工业园		产品编号/批号	---
生产单位	惠州市雷克兰士科技有限公司		抽样单编号	---
受检单位	惠州市雷克兰士科技有限公司		生产日期	---
抽样单位	---		样品数量	40(个)
抽样地点	---		抽样基数	---
抽样日期	---		检验地点	本部实验室
收样日期	2020 年 02 月 28 日		检验日期	2020 年 02 月 28 日~ 2020 年 03 月 02 日
检测依据	GB 2626-2006 《呼吸防护用品 自吸过滤式防颗粒物呼吸器》			
判定依据	---			
检测结论	<p>本次委托检测共检 7 项, 所检项目符合标准的要求。</p> <p style="text-align: right;">(检验检测专用章) 签发日期: 2020 年 03 月 02 日</p>			
备注	<p>报告中的“---”表示此项不适用, 报告中“/”表示此项空白。</p> <p>FZ2002401 检验报告作废。</p>			

批准:

审核:

主检:

# 检测报告

## TEST REPORT

第 2 页 共 5 页

序号	检测项目[单位]	标准条款	标准要求	检测结果		单项结论	备注
1	过滤效率[%]	5.3	KN95 $\geq$ 95.0	未预处理	99.50	合格	/
					99.52		
					99.40		
					99.61		
					99.65		
					99.55		
					99.71		
					99.68		
					99.42		
					99.58		
			预处理	99.40			
				99.45			
				99.20			
				99.77			
氯化钠颗粒物检测 温度：(25 $\pm$ 5)℃ 湿度：(30 $\pm$ 10)%	实测温度：(23~25)℃ 实测湿度：(35~37)%						
	99.81						
2	吸气阻力[Pa]	5.5	总吸气阻力 $\leq$ 350	未预处理	37.3	合格	/
					39.5		
				预处理	42.7		
					43.0		
3	呼气阻力[Pa]	5.5	总呼气阻力 $\leq$ 250	未预处理	44.9	合格	/
					43.2		
				预处理	47.8		
					45.2		

# 检测报告

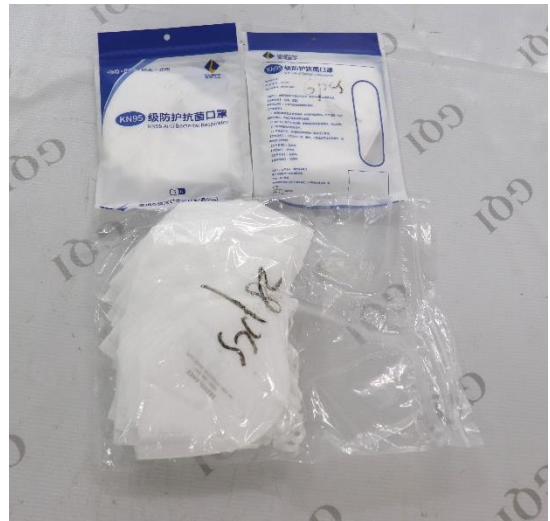
## TEST REPORT

第 3 页 共 5 页

序号	检测项目[单位]	标准条款	检测方法	检测结果		单项结论	备注
4	死腔[%]	5.7	以吸入气中二氧化碳体积分数表示时，结果平均值应 $\leq 1$	平均值：0.8		合格	/
5	头带	5.9	随弃式面罩的每条头带、带扣及其他调节部件在承受 10N，持续时间 10s 的拉力时，不应出现滑脱或断裂	未预处理	未出现滑脱、断裂	合格	/
				预处理	未出现滑脱、断裂		
6	连接和连接部件	5.10	可更换式半面罩在规定检测条件下，可更换式过滤元件与面罩之间的所有连接和连接部件，在承受 50N，持续时间 10s 的轴向拉力时，不应出现滑脱、断裂或变形	未预处理	无此部件，此项不检	---	/
				预处理			
7	可燃性	5.13	暴露于火焰的各部件在从火焰移开后，不应燃烧；如果燃烧，续燃时间不应超过 5s	未预处理	未出现燃烧现象	合格	/
					未出现燃烧现象		
				预处理	未出现燃烧现象		
					未出现燃烧现象		

# 检测报告

## TEST REPORT



样品描述

/

型号规格或其它说明

/

# 检测报告

TEST REPORT



第 5 页 共 5 页

附注：

- 1、试验地点：广州市黄埔区科学城科学大道 10 号
- 2、委托单位地址及邮编：惠州市仲恺高新区陈江大道惠谷工业园
- 3、检测环境条件：检测项目均在相应标准规定的条件下进行（有注明的除外）
- 4、抽样程序（如适用）：-----
- 5、偏离标准方法的说明（如适用）：-----
- 6、检测结果不确定度说明（如适用）：-----
- 7、分包项目及分包方（如适用）：-----

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中国认可  
国际互认  
检测  
TESTING  
CNAS L0153



# TEST REPORT

## (Translation Version)

Company: Huizhou Lexuslanche Technology Co, Ltd

Manufacturer: Huizhou Lexuslanche Technology Co, Ltd

Sample name: KN95 Protective Mask

Model and specification: -----

Test category: Entrusted testing



**广东产品质量监督检验研究院**

GUANGDONG TESTING INSTITUTE OF PRODUCT QUALITY SUPERVISION



## GUANGDONG TESTING INSTITUTE OF PRODUCT QUALITY SUPERVISION

## TEST REPORT



Report random No.: NCH1305

Page 1 of 5

Sample name	KN95 Protective Mask		Sample No.	YFZ20/002401
	Sample by sending (√)	Random sample (√)		
Trademark	---		Model and specification	---
Company	Huizhou Lexuslanse Technology Co, Ltd		Test category	Entrusted testing
Address of company	Phase A, Plant A, EelingXiechang Company, Wuyi Village, Chenjiang Street Office, Zhongkai High-tech Zone, Huizhou		Product No. / batch No	---
Manufacturer	Huizhou Lexuslanse Technology Co, Ltd		Sampling list No	---
Inspected unit	Huizhou Lexuslanse Technology Co, Ltd		Date of manufacture	---
Sampling unit	---		Number of samples	40pcs
Sampling location	---		Sampling basic number	---
Sampling date	---		Inspection location	Headquarter laboratory
Sample received date	28/2/2020		Inspection date	28/2/2020-02/03/2020
Test basis	GB 2626-2006 Respiratory protective equipment - Non-powered air-purifying particle respirator			
Judgment basis	---			
Test conclusion	7 items have been inspected and the inspected items meet the requirements of the standard			
Remarks	"--" in the report indicates that this item is not applicable, and "/" in the report indicates that this item is blank. Fz2002401 inspection report is invalid.			

Approval:

Verified:

Main inspector:

## TEST REPORT

Report random No.: NCH1305  
of 5

Page 2

Serial number	Test item [unit]	Standard clause	Standard requirement	Test result	Item conclusion	Remarks	
1	Filtration efficiency [%]	5.3	KN95 $\geq$ 95.0	Non preconditioned	99.50	PASS	/
					99.52		
					99.40		
					99.65		
					99.61		
					99.55		
					99.71		
					99.68		
					99.42		
				99.58			
				Preconditioned	99.40		
					99.45		
					99.20		
					99.77		
99.81							
Sodium chloride test (NaCl) Temperature: (25 $\pm$ 5) $^{\circ}$ C Humidity: (30 $\pm$ 10%)				Measured temperature: (23-25) $^{\circ}$ C Measured humidity: (35-37%)			
2	Inspiratory resistance [Pa]	5.5	Total Inspiratory resistance $\leq$ 350	Non preconditioned	37.3	PASS	/
					39.5		
				Preconditioned	42.7		
					43.0		
3	Expiratory resistance [PA]	5.5	Total Expiratory resistance $\leq$ 250	Non preconditioned	44.9	PASS	/
					43.2		
				Preconditioned	47.8		
					45.2		

## TEST REPORT

Report random No.: NCH1305  
of 5

Page 3

Serial number	Test item [unit]	Standard clause	Standard requirement	Test result		Item conclusion	Remarks
4	Dead space [%]	5.7	The score is expressed by volume of carbon dioxide in suction gas  Mean of results should be $\leq 1$	Average: 0.8		PASS	/
5	Headband	5.9	Each headband, buckle and other adjusting parts of the disposable mask are under 10N, No slippage or fracture is allowed during the pulling force lasting for 10s	Non preconditioned	No Slippage and fracture	PASS	/
				Preconditioned	No Slippage and fracture		
6	Connecting and connecting parts	5.10	The replaceable half mask shall be tested under specified conditions, all connections and connecting parts between replaceable filter element and mask, It shall be no slippage, fracture or deformation under the axial tension of 50N for 10s	Non preconditioned	There is no this part, this item is not inspected	---	/
				Preconditioned			
7	Flammability	5.13	Parts exposed to the flame shall not burn after being removed	Non preconditioned	No combustion	PASS	/
					No combustion		



			from the flame; if it burns, the continuous burning time shall not exceed 5S	Preconditioned	No combustion		
					No combustion		

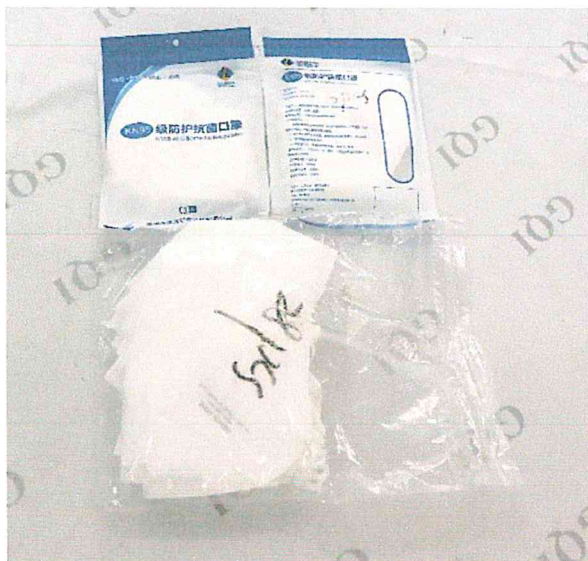
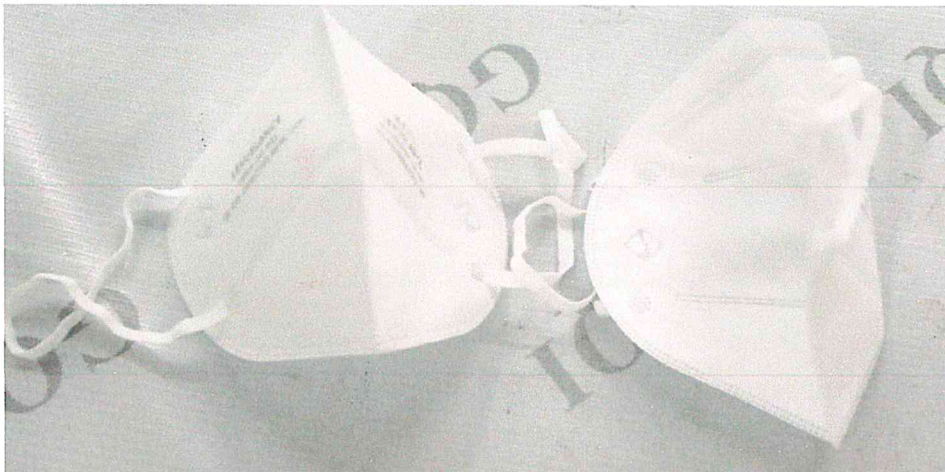
No.FZ2002401A

## TEST REPORT

Report random No.: NCH1305  
of 5

Page 4

### Pictures and description



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Sample description
/
Model, specification or other description
/

No.FZ2002401A

## TEST REPORT

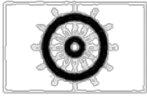
Report random No.: NCH1305  
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Page 5

Remarks:

1. Test site: 10 science Avenue ,Huangpu District, Science Road, Guangzhou
2. Address and postcode of the entrusting party: Huigu Industrial Park , Chenjiang Avenue, Zhongkai high tech Zone, Huizhou City
3. Test environmental conditions: The test shall be carried out under the conditions specified in the corresponding standards (unless otherwise noted)
4. Sampling procedure (if applicable): \_\_\_\_\_
5. Description of deviation from standard method (if applicable): \_\_\_\_\_
6. Description of uncertainty of test results (if applicable): \_\_\_\_\_
7. Subcontracted items and subcontractors (if applicable): \_\_\_\_\_





**Applicant:** HuiZhou Lexusance Technology Co., Ltd.  
**Address:** Plant A, Phase I, Eling Xiechang Company, Wuyi Village, Chenjiang Office, Zhongkai High Tech Zone, Huizhou City, Guangdong Province, China  
**Date:** April 30, 2020



**Certificate : Confirmation of processing**



To whom it may concern,



We herewith confirm that HuiZhou Lexusance Technology Co., Ltd. has submitted an application for ORDER 2020EC0522/ 2020CN0523 for EU Type examination certification according to PPE-R/02.075.



Please note that the application is currently in progress. Upon full compliance with the requirements of PPE-R/02.075 the certificate will be issued for **EU TYPE EXAMINATION in compliance with what is stated in Regulation (EU) 2016/425 and in agreement with the applicable tests procedures and technical specifications. Destined for respiratory protection, according to standards PPE/R-02.075.**



This confirmation is valid in 1 month. It cannot be renewed and cannot be used as a certificate replacement.

Best regards,





SIMON LI  
AITEX ShangHai Office





<b>TEST REPORT</b> <b>EN 149:2001+A1:2009</b> <b>Respiratory protective devices — Filtering half masks to protect against particles — Requirements, testing, marking</b>	
Report reference No.....	68.5.13.10.2800.2890
Tested by (name+signature).....	Peter Chen 
Approved by (name+signature).....	Steve Li 
Date of issue .....	2020-03-16
<b>Testing Laboratory name</b> .....	ACT Testing Technology Co., Ltd.
Address.....	Floor 5, Huaming Bldg., Chebei Rd., Zhongshan Dadao, Guangzhou, China
Applicant's Name .....	Huizhou Lexuslance Technology Co.Ltd
Address .....	Phase I Plant,EilingXiechang Company,Wuyi Village,Chenjiang Sub-district Office,Zhongkai High-tech Zone,Huizhou City,Guangdong Province,China.
<b>Test specification</b>	
Standard .....	EN 149:2001 +A1:2009
Test procedure .....	ACT
Procedure deviation .....	N/A
Non-standard test method .....	N/A
<b>Test Report Form</b>	EN 149:2001 +A1:2009
TRF originator. ....	ACT
Master TRF (date) .....	2020-03
<b>Test item description</b> .....	KN95 Protective Mask
Trademark .....	N/A
Model and/or type reference .....	LK-003
Manufacturer .....	Huizhou Lexuslance Technology Co.Ltd
Address .....	Phase I Plant,EilingXiechang Company,Wuyi Village,Chenjiang Sub-district Office,Zhongkai High-tech Zone,Huizhou City,Guangdong Province,China.
Factory .....	Huizhou Lexuslance Technology Co.Ltd
Address .....	Phase I Plant,EilingXiechang Company,Wuyi Village,Chenjiang Sub-district Office,Zhongkai High-tech Zone,Huizhou City,Guangdong Province,China.
Rating(s) .....	FFP2

**Copy of marking plate:**

Huizhou Lexuslance Technology Co.Ltd KN95 Protective Mask Model: LK-003 FFP2 EN 149:2001 +A1:2009 2020/03	 
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**Summary of test results:**

The test samples was found to comply with the equipments of EN 149:2001 +A1:2009

**Test case verdicts**

Test case does not apply to the test object :	N/A
Test item does meet the requirement :	P(ass)
Test item does not meet the requirement :	F(ail)

**Testing**

Date of receipt of test item :	2020-03-07
Date(s) of performance of test :	2020-03-07 to 2020-03-16

**General remarks**

**This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECCE 02.**

The test results presented in this report relate only to the object tested.  
 This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

"(see Enclosure #)" refers to additional information appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

**General informations:**

EN 149:2001+A1:2009			
Clause	Requirement - Test	Result - Remark	Verdict
<b>3</b>	<b>Terms and definitions</b>		—
	For the purposes of this European Standard the definitions given in EN 132 and the nomenclature given in EN 134 apply together with the following:		—
<b>3.1</b>	<b>re-useable particle filtering half mask</b> particle filtering half mask intended to be used for more than a single shift		—
<b>4</b>	<b>Description</b>		—
	A particle filtering half mask covers the nose and mouth and the chin and may have inhalation and/or exhalation valve(s). The half mask consists entirely or substantially of filter material or comprises a facepiece in which the main filter(s) form an inseparable part of the device.	Not the exhalation valve(s)	—
	It is intended to provide adequate sealing on the face of the wearer against the ambient atmosphere, when the skin is dry or moist and when the head is moved.		—
	Air enters the particle filtering half mask and passes directly to the nose and mouth area of the facepiece or, via an inhalation valve(s) if fitted. The exhaled air flows through the filter material and/or an exhalation valve (if fitted) directly to the ambient atmosphere.	Not the exhalation valve(s)	—
	These devices are designed to protect against both solid and liquid aerosols.		—
<b>5</b>	<b>Classification</b>		—
	Particle filtering half masks are classified according to their filtering efficiency and their maximum total inward leakage. There are three classes of devices: FFP1, FFP2 and FFP3. The protection provided by an FFP2 - or FFP3 - device includes that provided by the device of lower class or classes. In addition, particle filtering half masks are classified as single shift use only or as re-useable (more than one shift).	FFP2	—
<b>6</b>	<b>Designation</b>		—
	Particle filtering half masks meeting the requirements of this European Standard shall be designated in the following manner: Particle filtering half mask EN 149, year of publication, classification, option (where "D" is an option for a non re-useable particle filtering half mask and mandatory for re-useable particle filtering half mask).		—



EN 149:2001+A1:2009			
Clause	Requirement - Test	Result - Remark	Verdict

<b>7</b>	<b>Requirements</b>		P
<b>7.1</b>	<b>General</b>		P
	In all tests all test samples shall meet the requirements.		P
<b>7.2</b>	<b>Nominal values and tolerances</b>		P
	Unless otherwise specified, the values stated in this European Standard are expressed as nominal values. Except for temperature limits, values which are not stated as maxima or minima shall be subject to a tolerance of $\pm 5\%$ . Unless otherwise specified, the ambient temperature for testing shall be $(16 - 32)^\circ\text{C}$ , and the temperature limits shall be subject to an accuracy of $\pm 1^\circ\text{C}$ .		—
<b>7.3</b>	<b>Visual inspection</b>	Meet the requirements	P
	The visual inspection shall also include the marking and the information supplied by the manufacturer.		P
<b>7.4</b>	<b>Packaging</b>	Meet the requirements	P
	Particle filtering half masks shall be offered for sale packaged in such a way that they are protected against mechanical damage and contamination before use. Testing shall be done in accordance with 8.2		P
<b>7.5</b>	<b>Material</b>	Meet the requirements	P
	Materials used shall be suitable to withstand handling and wear over the period for which the particle filtering half mask is designed to be used. After undergoing the conditioning described in 8.3.1 none of the particle filtering half masks shall have suffered mechanical failure of the facepiece or straps.		P
	Three particle filtering half masks shall be tested.		P
	When conditioned in accordance with 8.3.1 and 8.3.2 the particle filtering half mask shall not collapse.		P
	Any material from the filter media released by the air flow through the filter shall not constitute a hazard or nuisance for the wearer. Testing shall be done in accordance with 8.2.		P
<b>7.6</b>	<b>Cleaning and disinfecting</b>		N/A

EN 149:2001+A1:2009			
Clause	Requirement - Test	Result - Remark	Verdict
	If the particle filtering half mask is designed to be re-usable, the materials used shall withstand the cleaning and disinfecting agents and procedures to be specified by the manufacturer.	Not applicable	N/A
	Testing shall be done in accordance with 8.4 and 8.5.		N/A
	With reference to 7.9.2, after cleaning and disinfecting the re-usable particle filtering half mask shall satisfy the penetration requirement of the relevant class. Testing shall be done in accordance with 8.11.		N/A
<b>7.7</b>	<b>Practical performance</b>	No imperfection	P
	The particle filtering half mask shall undergo practical performance tests under realistic conditions.		P
	These general tests serve the purpose of checking the equipment for imperfections that cannot be determined by the tests described elsewhere in this standard.		P
	Where practical performance tests show the apparatus has imperfections related to wearer's acceptance, the test house shall provide full details of those parts of the practical performance tests which revealed these imperfections. Testing shall be done in accordance with 8.4.		P
<b>7.8</b>	<b>Finish of parts</b>	No sharp edges or burrs	P
	Parts of the device likely to come into contact with the wearer shall have no sharp edges or burrs. Testing shall be done in accordance with 8.2.		P
<b>7.9</b>	<b>Leakage</b>		P
<b>7.9.1</b>	<b>Total inward leakage</b>		P
	The laboratory tests shall indicate that the particle filtering half mask can be used by the wearer to protect with high probability against the potential hazard to be expected.		P
	The total inward leakage consists of three components: face seal leakage, exhalation valve leakage (if exhalation valve fitted) and filter penetration.	Not the exhalation valve(s)	P

EN 149:2001+A1:2009																	
Clause	Requirement - Test	Result - Remark	Verdict														
	For particle filtering half masks fitted in accordance with the manufacturer's information, at least 46 out of the 50 individual exercise results (i.e. 10 subjects x 5 exercises) for total inward leakage shall be not greater than 25 % for FFP1 11 % for FFP2 5 % for FFP3	total inward leakage: 1,95%	P														
	and, in addition, at least 8 out of the 10 individual wearer arithmetic means for the total inward leakage shall be not greater than 22 % for FFP1 8 % for FFP2 2 % for FFP3. Testing shall be done in accordance with 8.5.	total inward leakage: 1,98%	P														
<b>7.9.2</b>	<b>Penetration of filter material</b>		P														
	The penetration of the filter of the particle filtering half mask shall meet the requirements of Table 1.	FFP2 (See Page 26 Test Result)	P														
	<p style="text-align: center;"><b>Table 1 — Penetration of filter material</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Classification</th> <th colspan="2">A<sub>1</sub> Maximum penetration of test aerosol A<sub>1</sub></th> </tr> <tr> <th>Sodium chloride test 95 l/min % max.</th> <th>Paraffin oil test 95 l/min % max.</th> </tr> </thead> <tbody> <tr> <td>FFP1</td> <td style="text-align: center;">20</td> <td style="text-align: center;">20</td> </tr> <tr> <td>FFP2</td> <td style="text-align: center;">6</td> <td style="text-align: center;">6</td> </tr> <tr> <td>FFP3</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> </tr> </tbody> </table>		Classification	A <sub>1</sub> Maximum penetration of test aerosol A <sub>1</sub>		Sodium chloride test 95 l/min % max.	Paraffin oil test 95 l/min % max.	FFP1	20	20	FFP2	6	6	FFP3	1	1	—
Classification	A <sub>1</sub> Maximum penetration of test aerosol A <sub>1</sub>																
	Sodium chloride test 95 l/min % max.	Paraffin oil test 95 l/min % max.															
FFP1	20	20															
FFP2	6	6															
FFP3	1	1															
	A total of 9 samples of particle filtering half masks shall be tested for each aerosol.		P														
	Testing in accordance with 8.11 using the Penetration test according to EN 13274-7, shall be performed on: - 3 samples as received; - 3 samples after the simulated wearing treatment described in 8.3.1.		P														
	Testing in accordance with 8.11 using the Exposure test with a specified mass of test aerosol of 120 mg, and for particle filtering devices claimed to be re-usable additionally the Storage test, according to EN 13274-7, shall be performed:		P														
	for non-re-usable devices on: - 3 samples after the test for mechanical strength in accordance with 8.3.3 followed by temperature conditioning in accordance with 8.3.2.		P														
<b>7.10</b>	<b>Compatibility with skin</b>	No influence	P														



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Clause	Requirement - Test	Result - Remark	Verdict
	Materials that may come into contact with the wearer's skin shall not be known to be likely to cause irritation or any other adverse effect to health.		P
	Testing shall be done in accordance with 8.4 and 8.5.		P
<b>7.11</b>	<b>Flammability</b>		P
	The material used shall not present a danger for the wearer and shall not be of highly flammable nature.		P
	When tested, the particle filtering half mask shall not burn or not to continue to burn for more than 5 s after removal from the flame. The particle filtering half mask does not have to be usable after the test. Testing shall be done in accordance with 8.6.	continue to burn for 2s	P
<b>7.12</b>	<b>Carbon dioxide content of the inhalation air</b>		P
	The carbon dioxide content of the inhalation air (dead space) shall not exceed an average of 1,0 % (by volume). Testing shall be done in accordance with 8.7.	0,10%	P
<b>7.13</b>	<b>Head harness</b>	Meet the requirements	P
	The head harness shall be designed so that the particle filtering half mask can be donned and removed easily.		P
	The head harness shall be adjustable or self-adjusting and shall be sufficiently robust to hold the particle filtering half mask firmly in position and be capable of maintaining total inward leakage requirements for the device. Testing shall be done in accordance with 8.4 and 8.5.		P
<b>7.14</b>	<b>Field of vision</b>		P
	The field of vision is acceptable if determined so in practical performance tests. Testing shall be done in accordance with 8.4.		P
<b>7.15</b>	<b>Exhalation valve(s)</b>	Not The Exhalation Valve(s)	N/A

EN 149:2001+A1:2009																									
Clause	Requirement - Test	Result - Remark	Verdict																						
	<p>A particle filtering half mask may have one or more exhalation valve(s), which shall function correctly in all orientations.</p> <p>Testing shall be done in accordance with 8.2 and 8.9.1.</p> <p>If an exhalation valve is provided it shall be protected against or be resistant to dirt and mechanical damage and may be shrouded or may include any other device that may be necessary for the particle filtering half mask to comply with 7.9.</p> <p>Testing shall be done in accordance with 8.2.</p> <p>Exhalation valve(s), if fitted, shall continue to operate correctly after a continuous exhalation flow of 300 l/min over a period of 30 s.</p> <p>Testing shall be done in accordance with 8.3.4.</p> <p>When the exhalation valve housing is attached to the faceblank, it shall withstand axially a tensile force of 10 N applied for 10 s.</p> <p>Testing shall be done in accordance with 8.8.</p>		N/A																						
<b>7.16</b>	<b>Breathing resistance</b>	See Page 26 Test Result	P																						
	<p>The breathing resistances apply to valved and valveless particle filtering half masks and shall meet the requirements of Table 2.</p> <p>Testing shall be done in accordance with 8.9.</p>		P																						
	<p style="text-align: center;"><b>Table 2 — Breathing resistance</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="3">Classification</th> <th colspan="3">Maximum permitted resistance (mbar)</th> </tr> <tr> <th colspan="2">inhalation</th> <th>exhalation</th> </tr> <tr> <th>30 l/min</th> <th>95 l/min</th> <th>160 l/min</th> </tr> </thead> <tbody> <tr> <td>FFP1</td> <td>0,6</td> <td>2,1</td> <td>3,0</td> </tr> <tr> <td>FFP2</td> <td>0,7</td> <td>2,4</td> <td>3,0</td> </tr> <tr> <td>FFP3</td> <td>1,0</td> <td>3,0</td> <td>3,0</td> </tr> </tbody> </table>		Classification	Maximum permitted resistance (mbar)			inhalation		exhalation	30 l/min	95 l/min	160 l/min	FFP1	0,6	2,1	3,0	FFP2	0,7	2,4	3,0	FFP3	1,0	3,0	3,0	—
Classification	Maximum permitted resistance (mbar)																								
	inhalation			exhalation																					
	30 l/min	95 l/min	160 l/min																						
FFP1	0,6	2,1	3,0																						
FFP2	0,7	2,4	3,0																						
FFP3	1,0	3,0	3,0																						
<b>7.17</b>	<b>Clogging</b>		P																						
<b>7.17.1</b>	<b>General</b>		P																						
	<p>For single shift use devices, the clogging test is an optional test. For re-usable devices the test is mandatory.</p>		N/A																						
	<p>Devices designed to be resistant to clogging, shown by a slow increase of breathing resistance when loaded with dust, shall be subjected to the treatment described in 8.10.</p>		N/A																						
	<p>The specified breathing resistances shall not be exceeded before the required dust load of 833 mg h/m<sup>3</sup> is reached.</p>		N/A																						

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Clause	Requirement - Test	Result - Remark	Verdict
<b>7.17.2</b>	<b>Breathing resistance</b>		P
<b>7.17.2.1</b>	<b>Valved particle filtering half masks</b>	Not The Exhalation Valve(s)	N/A
	After clogging the inhalation resistances shall not exceed FFP1: 4 mbar FFP2: 5 mbar FFP3: 7 mbar at 95 l/min continuous flow;		N/A
	The exhalation resistance shall not exceed 3 mbar at 160 l/min continuous flow. Testing shall be done in accordance with 8.9.		N/A
<b>7.17.2.2</b>	<b>Valveless particle filtering half masks</b>		P
	After clogging the inhalation and exhalation resistances shall not exceed FFP1: 3 mbar FFP2: 4 mbar FFP3: 5 mbar at 95 l/min continuous flow. Testing shall be done in accordance with 8.9	2.7mbar	P
<b>7.17.3</b>	<b>Penetration of filter material</b>	Meet the requirements	P
	All types (valved and valveless) of particle filtering half masks claimed to meet the clogging requirement shall also meet the requirements given in 7.9.2, for the Penetration test according to EN 13274-7, after the clogging treatment. Testing shall be done in accordance with 8.11 using EN 13274-7		P
<b>7.18</b>	<b>Demountable parts</b>		N/A
	All demountable parts (if fitted) shall be readily connected and secured, where possible by hand. Testing shall be done in accordance with 8.2.		
<b>8</b>	<b>Testing</b>		—
<b>8.1</b>	<b>General</b>		P
	If no special measuring devices and methods are specified, commonly used devices and methods shall be used. NOTE For a summary of testing, see Table 4. Before performing tests involving human subjects account should be taken of any national regulations concerning the medical history, examination or supervision of the test subjects.		—

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Clause	Requirement - Test	Result - Remark	Verdict
<b>8.2</b>	<b>Visual inspection</b> The visual inspection is carried out where appropriate by the test house prior to laboratory or practical performance tests.		P
<b>8.3</b>	<b>Conditioning</b>		P
<b>8.3.1</b>	<b>Simulated wearing treatment</b>		P
	Conditioning by simulated wearing treatment shall be carried out by the following process.		—
	A breathing machine is adjusted to 25 cycles/min and 2,0 l/stroke. The particle filtering half mask is mounted on a Sheffield dummy head. For testing, a saturator is incorporated in the exhalation line between the breathing machine and the dummy head, the saturator being set at a temperature in excess of 37 ° C to allow for the cooling of the air before it reaches the mouth of the dummy head. The air shall be saturated at $(37 \pm 2) ^\circ \text{C}$ at the mouth of the dummy head. In order to prevent excess water spilling out of the dummy' s mouth and contaminating the particle filtering half mask the head shall be inclined so that the water runs away from the mouth and is collected in a trap.		—
	The breathing machine is brought into operation, the saturator switched on and the apparatus allowed to stabilize. The particle filtering half mask under test shall then be mounted on the dummy head. During the test time at approximately 20 min intervals the particle filtering half mask shall be completely removed from the dummy head and refitted such that during the test period it is fitted ten times to the dummy head		—
<b>8.3.2</b>	<b>Temperature conditioning</b>		P
	Expose the particle filtering half masks to the following thermal cycle:		—
	a) for 24 h to a dry atmosphere of $(70 \pm 3) ^\circ \text{C}$ ;		—
	b) for 24 h to a temperature of $(-30 \pm 3) ^\circ \text{C}$ ; and allow to return to room temperature for at least 4 h between exposures and prior to subsequent testing.		—
	The conditioning shall be carried out in a manner which ensures that no thermal shock occurs.		—
<b>8.3.3</b>	<b>Mechanical strength</b>		P



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Clause	Requirement - Test	Result - Remark	Verdict
	Conditioning shall be done in accordance with EN 143.		—
<b>8.3.4</b>	<b>Flow conditioning</b>		P
	A total of 3 valved particle filtering half masks shall be tested, one as received and two temperature conditioned in accordance with 8.3.2.		—
<b>8.4</b>	<b>Practical performance</b>		P
<b>8.4.1</b>	<b>General</b>		—
	A total of 2 particle filtering half masks shall be tested: both as received. All tests shall be carried out by two test subjects at ambient temperature and the test temperature and humidity shall be recorded. Prior to the test there shall be an examination to assure that the particle filtering half mask is in good working condition and that it can be used without hazard. Examination shall be done in accordance with 8.2.		—
<b>8.4.2</b>	<b>Walking test</b>		P
	The subjects wearing normal working clothes and wearing the particle filtering half mask shall walk at a regular rate of 6 km/h on a level course. The test shall be continuous, without removal of the particle filtering half mask, for a period of 10 min.		—
<b>8.4.3</b>	<b>Work simulation test</b>		P
	The particle filtering half mask shall be tested under conditions which can be expected during normal use. During this test the following activities shall be carried out in simulation of the practical use of the particle filtering half mask. The test shall be completed within a total working time of 20 min.		—
	The sequence of activities is at the discretion of the test house. The individual activities shall be arranged so that sufficient time is left for the comments prescribed.		—
	a) walking on the level with headroom of (1,3 ± 0,2) m for 5 min;		—
	b) crawling on the level with headroom of (0,70 ± 0,05) m for 5 min;		—

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Clause	Requirement - Test	Result - Remark	Verdict
	c) filling a small basket (see Figure 1, approximate volume = 8 l) with chippings or other suitable material from a hopper which stands 1,5 m high and has an opening at the bottom to allow the contents to be shovelled out and a further opening at the top where the basket full of chippings is returned.		—
	The subject shall stoop or kneel as he wishes and fill the basket with chippings. He shall then lift the basket and empty the contents back into the hopper. This shall be done 20 times in 10 min.		—
<b>8.5</b>	<b>Leakage</b>		P
<b>8.5.1</b>	<b>General test procedure</b>		—
<b>8.5.1.1</b>	<b>Total inward leakage</b>		—
	A total of 10 test specimens shall be tested: 5 as received and 5 after temperature conditioning in accordance with 8.3.2.		—
	The total inward leakage shall be tested using sodium chloride aerosol.		—
	Prior to the test there shall be an examination to ensure that the particle filtering half mask is in good working condition and that it can be used without hazard. Examination shall be done in accordance with 8.2.		—
	For the test, persons shall be selected who are familiar with using such or similar equipment.		—
	A panel of ten clean-shaven persons (without beards or sideburns) shall be selected covering the spectrum of facial characteristics of typical users (excluding significant abnormalities). It is to be expected that exceptionally some persons cannot be satisfactorily fitted with a particle filtering half mask. Such exceptional subjects shall not be used for testing particle filtering half masks. In the test report the faces of the ten test subjects shall be described (for information only) by the four facial dimensions (in mm) illustrated in Figure 2.		—
<b>8.5.1.2</b>	<b>Test equipment</b>		—

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Clause	Requirement - Test	Result - Remark	Verdict
	The test atmosphere shall preferably enter the top of the enclosure through a flow distributor, and be directed downwards over the head of the test subject at a minimum flow rate of 0,12 m/s. The concentration of the test agent inside the effective working volume shall be checked to be homogeneous. The flow rate should be measured close to the subject's head.		—
	A level treadmill is required capable of working at 6 km/h.		—
<b>8.5.1.3</b>	<b>Test procedure</b>		—
	Ask the test subjects to read the manufacturer's fitting information and if more than one size of particle filtering half mask is manufactured, ask the test subject to select the size deemed by him to be the most appropriate. If necessary the test supervisor shall show the test subjects how to fit the particle filtering half mask correctly in accordance with the fitting information.		—
	Inform the test subjects that if they wish to adjust the particle filtering half mask during the test they may do so. However if this is done, repeat the relevant section of the test, having allowed the system to resettle.		—
	The test subjects shall have no indication of the results as the test proceeds.		—
	After fitting the particle filtering half mask, ask each test subject 'Does the mask fit?'. If the answer is 'Yes', continue the test. If the answer is 'No', take the test subject off the panel, report the fact and replace with another test subject.		—
	The test sequence shall be as follows:		—
	a) Ensure the test atmosphere is OFF.		—
	b) Place the test subject in the enclosure. Connect up the facepiece sampling probe. Have the test subject walk at 6 km/h for 2 min. Measure the test agent concentration inside the particle filtering half mask to establish the background level.		—
	c) Obtain a stable reading.		—
	d) Turn the test atmosphere ON.		—
	e) The subject shall continue to walk for a further 2 min or until the test atmosphere has stabilized.		—

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Clause	Requirement - Test	Result - Remark	Verdict
	f) Whilst still walking the subject shall perform the following exercises: 1) walking for 2 min without head movement or talking; 2) turning head from side to side (approx. 15 times), as if inspecting the walls of a tunnel for 2 min; 3) moving the head up and down (approx. 15 times), as if inspecting the roof and floor for 2 min; 4) reciting the alphabet or an agreed text out loud as if communicating with a colleague for 2 min; 5) walking for 2 min without head movement or talking.		—
	g) Record 1) enclosure concentration; 2) the leakage over each exercise period.		—
	h) Turn off the test atmosphere and when the test agent has cleared from the enclosure remove the subject.		—
	After each test, replace the particle filtering half mask by a new sample.		—
<b>8.5.2</b>	<b>Method</b>		<b>P</b>
<b>8.5.2.1</b>	<b>Principle</b>		—
	The subject wearing the particle filtering half mask under test walks on a treadmill over which is an enclosure.		—
	Through this enclosure flows a constant concentration of NaCl aerosol. The air inside the particle filtering half mask is sampled and analysed during the inhalation phase of the respiratory cycle to determine the NaCl content. The sample is extracted by punching a hole in the particle filtering half mask and inserting a probe through which the sample is drawn. The pressure variation inside the particle filtering half mask is used to actuate a change-over valve so that inhaled air only is sampled. A second probe is inserted for this purpose.		—
<b>8.5.2.2</b>	<b>Test equipment (see Figure 3)</b>		—
<b>8.5.2.2.1</b>	<b>Aerosol generator</b>		—

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Clause	Requirement - Test	Result - Remark	Verdict
	The NaCl aerosol shall be generated from a 2 % solution of reagent grade NaCl in distilled water. An atomizer equivalent to the type described should be used (see Figure 4). This requires an air flow rate of 100 l/min at a pressure of 7 bar. The atomizer and its housing shall be fitted into a duct through which a constant flow of air is maintained. It may be necessary to heat or dehumidify the air in order to obtain complete drying of the aerosol particles.		—
<b>8.5.2.2.2</b>	<b>Test agent</b>		—
	The mean NaCl concentration within the enclosure shall be $(8 \pm 4)$ mg/m <sup>3</sup> and the variation throughout the effective working volume shall be not more than 10 %. The particle size distribution shall be 0,02 μm to 2 μm equivalent aerodynamic diameter with a mass median diameter of 0,6 μm.		—
<b>8.5.2.2.3</b>	<b>Flame photometer</b>		—
	A flame photometer shall be used to measure the concentration of NaCl inside the particle filtering half mask. Essential performance characteristics for a suitable instrument are:		—
	a) It should be a flame photometer specifically designed for the direct analysis of NaCl aerosol;		—
	b) It should be capable of measuring concentrations of NaCl aerosol between 15 mg/m <sup>3</sup> and 5 ng/m <sup>3</sup> ;		—
	c) The total aerosol sample required by the photometer should not be greater than 15 l/min;		—
	d) The response time of the photometer, excluding the sampling system, should not be greater than 500 ms;		—
	e) It is necessary to reduce the response to other elements, particularly carbon, the concentration of which will vary during the breathing cycle. This will be achieved by ensuring that the band pass width of the interference filter is no greater than 3 nm and that all necessary side-band filters are included		—
<b>8.5.2.2.4</b>	<b>Sample selector</b>		—
	A system is required which will switch the sample to the photometer only during the inhalation phase of the respiratory cycle.		—



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Clause	Requirement - Test	Result - Remark	Verdict
	During the exhalation phase clean air shall be fed to the photometer. The essential elements of such a system are:		—
	a) An electrically operated valve with a response time of the order of 100 ms. The valve should have the minimum possible dead space compatible with straight-through, unrestricted flow when open;		—
	b) A pressure sensor which is capable of detecting a minimum pressure change of approx. 0,05 mbar and which can be connected to a probe inserted in the cavity of the particle filtering half mask. The sensor shall have an adjustable threshold and be capable of differential signalling when the threshold is crossed in either direction. The sensor shall work reliably when subjected to the accelerations produced by the head movements of the subject;		—
	c) An interfacing system to actuate the valve in response to a signal from the pressure sensor;		—
	d) timing device to record the proportion of the total respiratory cycle during which sampling took place.		—
<b>8.5.2.2.5</b>	<b>Sampling probe</b>		—
	The probe shall be fitted securely in an airtight manner to the particle filtering half mask as near as possible to the centre line of the particle filtering half mask. A multiple hole sampling probe is strongly recommended		—
	Measures shall be taken to prevent the influence of condensation in the sampling probe on the measurement (by supplying dry air). Figure 5 shows a design that has been found suitable. The probe is adjusted so that it just touches the wearer's lips.		—
	Care shall be taken to ensure that the probe does not disturb the normal fit or shape of the mask.		—
<b>8.5.2.2.6</b>	<b>Sample pump</b>		—
	If no pump is incorporated into the photometer an adjustable flow pump is used to withdraw an air sample from the particle filtering half mask under test. This pump is so adjusted as to withdraw a constant flow of 1 l/min from the sample probe. Dependent on the type of photometer it may be necessary to dilute the sample with clean air.		—

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Clause	Requirement - Test	Result - Remark	Verdict
<b>8.5.2.2.7</b>	<b>Sampling of enclosure concentration</b> The enclosure aerosol concentration is monitored during the tests using a separate sampling system, to avoid contamination of the particle filtering half mask sampling lines. It is preferable to use a separate flame photometer for this purpose. If a second photometer is not available, sampling of the enclosure concentration using a separate sampling system and the same photometer may be made. However, time will then be required to allow the photometer to return to a clean background.		—
<b>8.5.2.2.8</b>	<b>Pressure detection probe</b>		—
	A second probe is fitted near to the sample probe and is connected to the pressure sensor.		—
<b>8.5.2.3</b>	<b>Expression of results</b>		—
	The leakage P shall be calculated from measurements made over the last 100 s of each of the exercise periods to avoid carry over of results from one exercise to the other. $P(\%) = \frac{C_2}{C_1} \times \left( \frac{t_{IN} + t_{EX}}{t_{IN}} \right) \times 100$ where C <sub>1</sub> is the challenge concentration C <sub>2</sub> is the measured mean concentration in the breathing zone of the test subject t <sub>IN</sub> is the total duration of inhalation t <sub>EX</sub> is the total duration of exhalation Measurement of C <sub>2</sub> is preferably made using an integrating recorder.		—
<b>8.6</b>	<b>Flammability</b>		P
	A total of four particle filtering half masks shall be tested: two in the state as received and two after temperature conditioning in accordance with 8.3.2.		—
	The single burner test is carried out according to the following procedure.		—
	The facepiece is put on a metallic dummy head which is motorized such that it describes a horizontal circle with a linear speed, measured at the tip of the nose, of (60 ± 5) mm/s.		—

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Clause	Requirement - Test	Result - Remark	Verdict
	Failure to meet the temperature requirement indicates that a fault such as a partially blocked burner exists. This shall be rectified before testing.		—
	The head is set in motion and the effect of passing the facepiece once through the flame shall be noted.		—
	The test shall be repeated to enable an assessment to be made of all materials on the exterior of the device. Any one component shall be passed through the flame once only.		—
<b>8.7</b>	<b>Carbon dioxide content of the inhalation air</b>		P
	A total of 3 particle filtering half masks shall be tested: all 3 as received.		—
	The apparatus consists essentially of a breathing machine with solenoid valves controlled by the breathing machine, a connector, a CO <sub>2</sub> flowmeter and a CO <sub>2</sub> analyser.		—
	The apparatus subjects the particle filtering half mask to a respiration cycle by the breathing machine.		—
	For this test the particle filtering half mask shall be fitted securely in a leak-tight manner but without deformation to a Sheffield dummy head (see Figure 6).		—
	Air shall be supplied to it from a breathing machine adjusted to 25 cycles/min and 2,0 l/stroke and the exhaled air shall have a carbon dioxide content of 5 % by volume.		—
	A typical test arrangement is shown in Figure 7. If the design of the test equipment causes a CO <sub>2</sub> build-up a CO <sub>2</sub> absorber shall be used in the inhalation branch between solenoid valve and breathing machine.		—
	The CO <sub>2</sub> is fed into the breathing machine via a control valve, a flowmeter, a compensating bag and two non-return valves.		—
	Immediately before the solenoid valve a small quantity of exhaled air is preferably continuously withdrawn through a sampling line and then fed into the exhaled air via a CO <sub>2</sub> analyser.		—

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Clause	Requirement - Test	Result - Remark	Verdict
	To measure the CO <sub>2</sub> content of the inhaled air, 5 % of the stroke volume of the inhalation phase of the breathing machine is drawn off at the marked place by an auxiliary lung and fed to a CO <sub>2</sub> analyser. The total dead space of the gas path (excluding the breathing machine) of the test installation should not exceed 2000 ml.		—
	Measure the carbon dioxide content of the inhaled air and record continuously.		—
	Test conditions are ambient atmospheric conditions.		—
	The ambient carbon dioxide level is measured 1 m in front of and level with the tips of the nose of the dummy head. The ambient level is measured once a stabilized level for carbon dioxide in the inhalation air has been attained.		—
	Alternatively, the ambient level of carbon dioxide may be measured at the sampling tube with the carbon dioxide supply turned off.		—
	Results are deemed acceptable only if the measured value of the ambient level of carbon dioxide is less than 0,1 %.		—
	The laboratory ambient carbon dioxide level shall be subtracted from the measured value. The air flow from the front shall be 0,5 m/s. For test arrangement see Figure 8.		—
	The test shall be performed until a constant carbon dioxide content in the inhalation air is achieved.		—
	Air shall be supplied to it from a breathing machine adjusted to 25 cycles/min and 2,0 l/stroke and the exhaled air shall have a carbon dioxide content of 5 % by volume.		—
	A typical test arrangement is shown in Figure 7. If the design of the test equipment causes a CO <sub>2</sub> build-up a CO <sub>2</sub> absorber shall be used in the inhalation branch between solenoid valve and breathing machine.		—
	The CO <sub>2</sub> is fed into the breathing machine via a control valve, a flowmeter, a compensating bag and two non-return valves.		—
	Immediately before the solenoid valve a small quantity of exhaled air is preferably continuously withdrawn through a sampling line and then fed into the exhaled air via a CO <sub>2</sub> analyser.		—



EN 149:2001+A1:2009			
Clause	Requirement - Test	Result - Remark	Verdict
	To measure the CO <sub>2</sub> content of the inhaled air, 5 % of the stroke volume of the inhalation phase of the breathing machine is drawn off at the marked place by an auxiliary lung and fed to a CO <sub>2</sub> analyser. The total dead space of the gas path (excluding the breathing machine) of the test installation should not exceed 2000 ml.		—
<b>8.8</b>	<b>Strength of attachment of exhalation valve housing</b>	Not the exhalation valve(s)	N/A
	A total of three particle filtering half masks shall be tested: one as received, one temperature conditioned in accordance with 8.3.2 and one after the test described for mechanical strength in EN 143.		—
	Mount the particle filtering half mask securely to a fixture as shown in Figure 9. Apply an axial tensile force of 10 N to the valve (housing) for 10 s, and note the results.		—
<b>8.9</b>	<b>Breathing Resistance</b>		P
<b>8.9.1</b>	<b>Test samples and fixture</b>		—
<b>8.9.1.1</b>	<b>Valveless particle filtering half masks™</b>		—
	A total of 9 valveless particle filtering™ half masks shall be tested: 3 as received, 3 after temperature conditioning in accordance with 8.3.2 and 3 after the test for simulated wearing in accordance with 8.3.1		—
<b>8.9.1.2</b>	<b>Valved particle filtering half masks™</b>		N/A
	A total of 12 valved particle filtering half masks shall be tested: 3 as received, 3 after temperature conditioning in accordance with 8.3.2, 3 after the test for simulated wearing in accordance with 8.3.1 and 3 after the flow conditioning in accordance with 8.3.4.		N/A
	The particle filtering half mask shall be fitted securely in a leaktight manner but without deformation on the Sheffield dummy head.		N/A
	The flow rate at which the resistance is measured shall be corrected to 23°C and 1 bar absolute.		N/A
<b>8.9.2</b>	<b>Exhalation resistance</b>		—

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Clause	Requirement - Test	Result - Remark	Verdict
	Seal the particle filtering half mask on the Sheffield dummy head. Measure the exhalation resistance at the opening for mouth of the dummy head using the adapter shown in Figure 6 and a breathing machine adjusted to 25 cycles/min and 2.0 l/stroke or a continuous flow 160 l/min. Use a suitable pressure transducer.		—
	Measure the exhalation resistance with the dummy head successively placed in 5 defined positions:		—
	facing directly ahead		—
	facing vertically upwards		—
	facing vertically downwards		—
	lying on the left side		—
	lying on the right side		—
<b>8.9.3</b>	<b>Inhalation resistance</b>		—
	Test the inhalation resistance at 30 l/min and 95 l/min continuous flow.		—
<b>8.10</b>	<b>Clogging</b>		P
<b>8.10.1</b>	<b>Principle</b>		—
	The test aerosol shall be dolomite. A total of 3 particle filtering half masks shall be tested: 1 as received and 2 after temperature conditioning in accordance with 8.3.2.		—
	The test consists of subjecting the particle filtering half mask to a sinusoidal breathing simulation, whilst the sample is surrounded by a known concentration of dolomite dust in air. Following the exposure, the breathing resistance and the filter penetration of the sample particle filtering half mask are measured.		—
<b>8.10.2</b>	<b>Test equipment</b>		—
	A scheme of a typical apparatus is given in Figure 10. The working area of the test chamber has a suggested square section of 650 mm · 650 mm.		—

EN 149:2001+A1:2009																																																			
Clause	Requirement - Test	Result - Remark	Verdict																																																
	The breathing machine has a displacement of 2,0 l/stroke. The exhaled air shall pass a humidifier in the exhaled air circuit, such that the exhaled air temperature, measured at the position of the sample particle filtering half mask is $(37 \pm 2) ^\circ \text{C}$ and 95 % R.H. minimum.		—																																																
<b>8.10.3</b>	<b>Test conditions</b>		—																																																
	Dust: DRB 4/15 dolomite The size distribution of dolomite dust is given in Table 3.		—																																																
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	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Coulter counter</th> <th colspan="2">Sedimentation analysis</th> </tr> <tr> <th>Size (equivalent spherical diameter)</th> <th>% Number particles oversize</th> <th>Size (Stokes diameter)</th> <th>% weight oversize</th> </tr> <tr> <th><math>\mu\text{m}</math></th> <th></th> <th><math>\mu\text{m}</math></th> <th></th> </tr> </thead> <tbody> <tr> <td>0,7</td> <td>100</td> <td>1</td> <td>99,5</td> </tr> <tr> <td>1</td> <td>80</td> <td>2</td> <td>97,5</td> </tr> <tr> <td>2</td> <td>30</td> <td>3</td> <td>95</td> </tr> <tr> <td>3</td> <td>17</td> <td>5</td> <td>85</td> </tr> <tr> <td>5</td> <td>7</td> <td>8</td> <td>70</td> </tr> <tr> <td></td> <td></td> <td>10</td> <td>50</td> </tr> <tr> <td>9</td> <td>2</td> <td>12</td> <td>26</td> </tr> <tr> <td></td> <td></td> <td>14</td> <td>10</td> </tr> <tr> <td>12</td> <td>1</td> <td>18</td> <td>1</td> </tr> </tbody> </table>		Coulter counter		Sedimentation analysis		Size (equivalent spherical diameter)	% Number particles oversize	Size (Stokes diameter)	% weight oversize	$\mu\text{m}$		$\mu\text{m}$		0,7	100	1	99,5	1	80	2	97,5	2	30	3	95	3	17	5	85	5	7	8	70			10	50	9	2	12	26			14	10	12	1	18	1	
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	The particle size distribution of the airborne dust at the working area of the dust chamber is given in Figure 11.		—																																																
	This characteristic is an essential parameter, which shall be verified especially if the geometry of the test chamber is somewhat different from the model described as follows:		—																																																

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Clause	Requirement - Test	Result - Remark	Verdict
	Continuous flow through the dust chamber: 60 m <sup>3</sup> /h, linear velocity 4 cm/s;		—
	Sinusoidal flow through the particle filtering half mask is delivered by a breathing machine adjusted to 15 cycles/min and 2,0 l/stroke; the exhaled air shall be saturated in humidity;		—
	Concentration of the dust: (400 ± 100) mg/m <sup>3</sup> ;		—
	Temperature of the air: (23 ± 2) ° C;		—
	Relative humidity of the air: (45 ± 15) %;		—
	Testing time: Until the product of measured dust concentration and exposure time is 833 mg h/m <sup>3</sup> or until:		—
	1) for valved particle filtering half masks the peak inhalation resistance (corresponding to a continuous flow of 95 l/min) has reached 4 mbar for class FFP1 or 5 mbar for class FFP2 or 7 mbar for class FFP3, or until the peak exhalation resistance has reached a 1,8 mbar (corresponding to 3 mbar at a continuous flow of 160 l/min);		—
	2) for valveless particle filtering half masks the peak inhalation or the peak exhalation resistance has reached 3 mbar for class FFP1 or 4 mbar for class FFP2 or 5 mbar for class FFP3. NOTE 833 mg h/m <sup>3</sup> corresponds to inhaling a total volume of air laden with 1,5 g of dust. This is represented for example by a dust concentration of 400 mg/m <sup>3</sup> and an exposure time of 125 min. Because of the dust losses on exhalation, the cumulative weight of dust collected on the particle filtering half mask will probably be less than 1,5 g. For this reason there is no purpose in weighing the sample particle filtering half mask.		—
<b>8.10.4</b>	<b>Test procedure</b>		—
	Convey dust from the distributor to the dust chamber where it is dispersed into the air stream of 60 m <sup>3</sup> /h.		—
	Fit the sample particle filtering half mask in a leaktight manner to a dummy head or a suitable filter holder located in the dust chamber. Connect the breathing machine and humidifier to the sample and operate for the specified testing time.		—
	The concentration of dust in the test chamber may be measured by drawing air at 2 l/min through a sampling probe equipped with a pre-weighed, high efficiency filter (open face, diameter 37 mm) located near the test sample, as shown in Figure 10.		—



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Clause	Requirement - Test	Result - Remark	Verdict
	Calculate the dust concentration from the weight of dust collected, the flow rate through the filter and the time of collection.		—
	Other suitable means may be used.		—
<b>8.10.5</b>	<b>Assessment of clogging</b>		—
	Following the exposure, measure the breathing resistance of the particle filtering half mask using clean air. Then measure the filter penetration in accordance with 8.11.		—
<b>8.11</b>	<b>Penetration of filter material</b>		P
	The device shall be mounted in a leak tight manner on a suitable adaptor and subjected to the test(s), ensuring that components of the device that could affect filter penetration values such as valves and harness attachment points are exposed to the challenge aerosol.		—
	Testing of penetration, exposure and storage shall be done in accordance with EN 13274-7.		—
<b>9</b>	<b>Marking</b>		—
<b>9.1</b>	<b>Packaging</b>	Meet the requirements	P
	The following information shall be clearly and durably marked on the smallest commercially available packaging or legible through it if the packaging is transparent.		P
<b>9.1.1</b>	The name, trademark or other means of identification of the manufacturer or supplier.		P
<b>9.1.2</b>	Type-identifying marking.		P
<b>9.1.3</b>	Classification		P
	The appropriate class (FFP1, FFP2 or FFP3) followed by a single space and then: "NR" if the particle filtering half mask is limited to single shift use only. Example: FFP3 NR, or "R" if the particle filtering half mask is re-usable. Example: FFP2 R D."		P
<b>9.1.4</b>	The number and year of publication of this European Standard.	Meet the requirements	P
<b>9.1.5</b>	At least the year of end of shelf life. The end of shelf life may be informed by a pictogram as shown in Figure 12a, where yyyy/mm indicates the year and month.	Meet the requirements	P
<b>9.1.6</b>	The sentence 'see information supplied by the manufacturer', at least in the official language(s) of the country of destination, or by using the pictogram as shown in Figure 12b.	Meet the requirements	P

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Clause	Requirement - Test	Result - Remark	Verdict
9.1.7	The manufacturer's recommended conditions of storage (at least the temperature and humidity) or equivalent pictogram, as shown in Figures 12c and 12d.	Meet the requirements	P
9.1.8	The packaging of those particle filtering half masks passing the dolomite clogging test shall be additionally marked with the letter "D". !This letter shall follow the classification marking preceded by a single space. Example FFP2 R D"	Meet the requirements	P
9.2	<b>Particle filtering half mask</b>	Meet the requirements	P
	Particle filtering half masks complying with this European Standard shall be clearly and durably marked with the following:	Meet the requirements	P
9.2.1	The name, trademark or other means of identification of the manufacturer or supplier.	Meet the requirements	P
9.2.2	Type-identifying marking.	Meet the requirements	P
9.2.3	The number and year of publication of this European Standard.	Meet the requirements	P
9.2.4	Classification The appropriate class (FFP1, FFP2 or FFP3) followed by a single space and then: "NR" if the particle filtering half mask is limited to single shift use only. Example: FFP3 NR, or "R" if the particle filtering half mask is re-usable. Example: FFP2 R D."	Meet the requirements	P
9.2.5	If appropriate the letter D (dolomite) in accordance with clogging performance. This letter shall follow the classification marking preceded by a single space (see 9.2.4). Examples FFP3 NR D, FFP2 R D"	Meet the requirements	P

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Clause	Requirement - Test	Result - Remark	Verdict

**TEST RESULT:**

7.92	Penetration of filter material		Result
Model	Sodium chloride test 95 l/min (%)	Paraffin oil test 95 l/min (%)	
LK-003	2.58	2.66	P

7.16	Breathing resistance(mbar)			Result
Model	inhalation		exhalation	
	30 l/min	95 l/min	160 l/min	
LK-003	0,66	2,05	2,25	P

Details of: LK-003

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View:

general

front

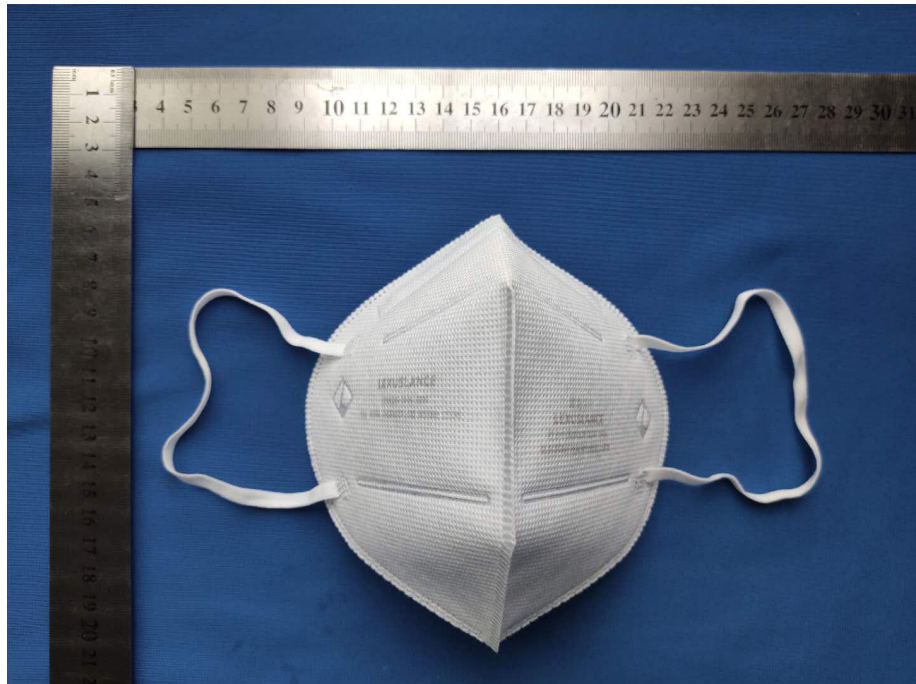
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Details of: General View

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View:

general

front

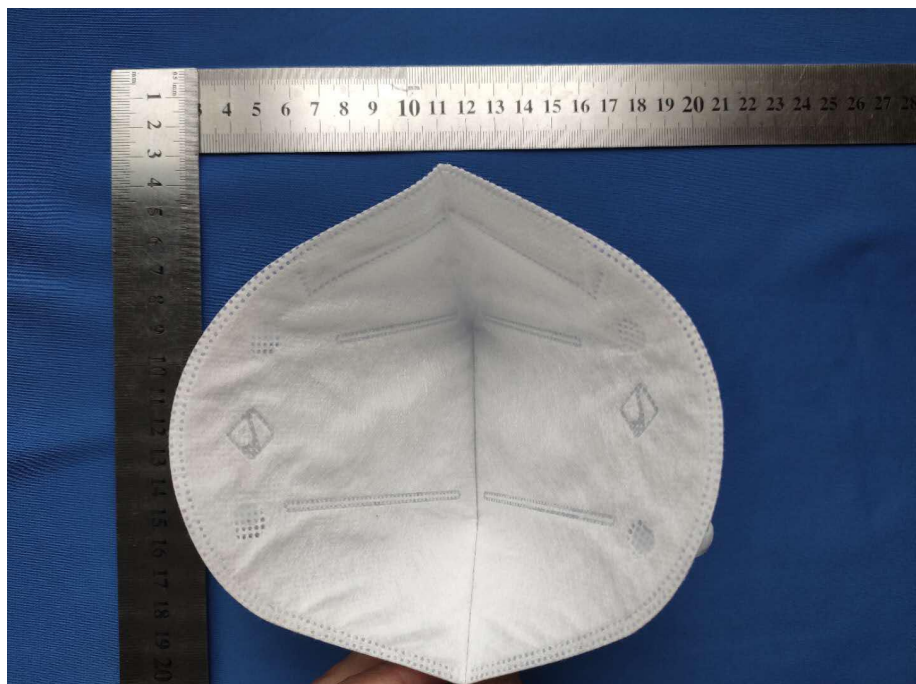
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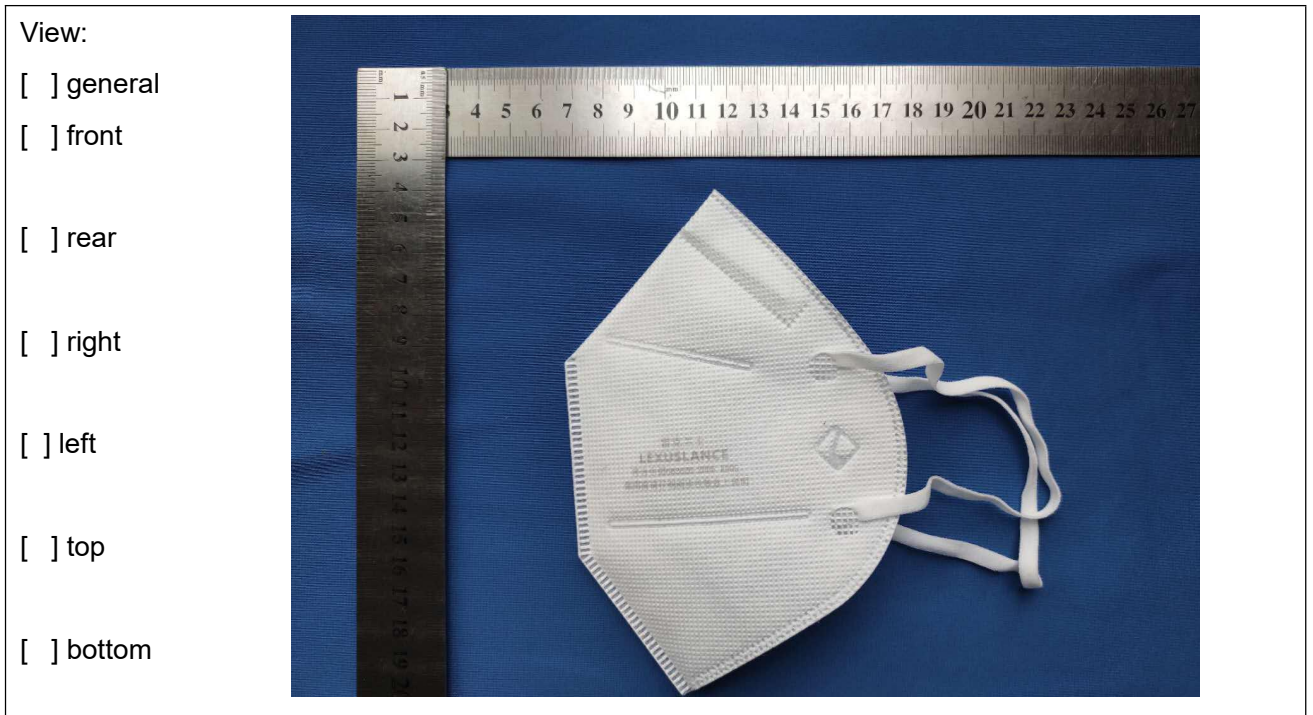
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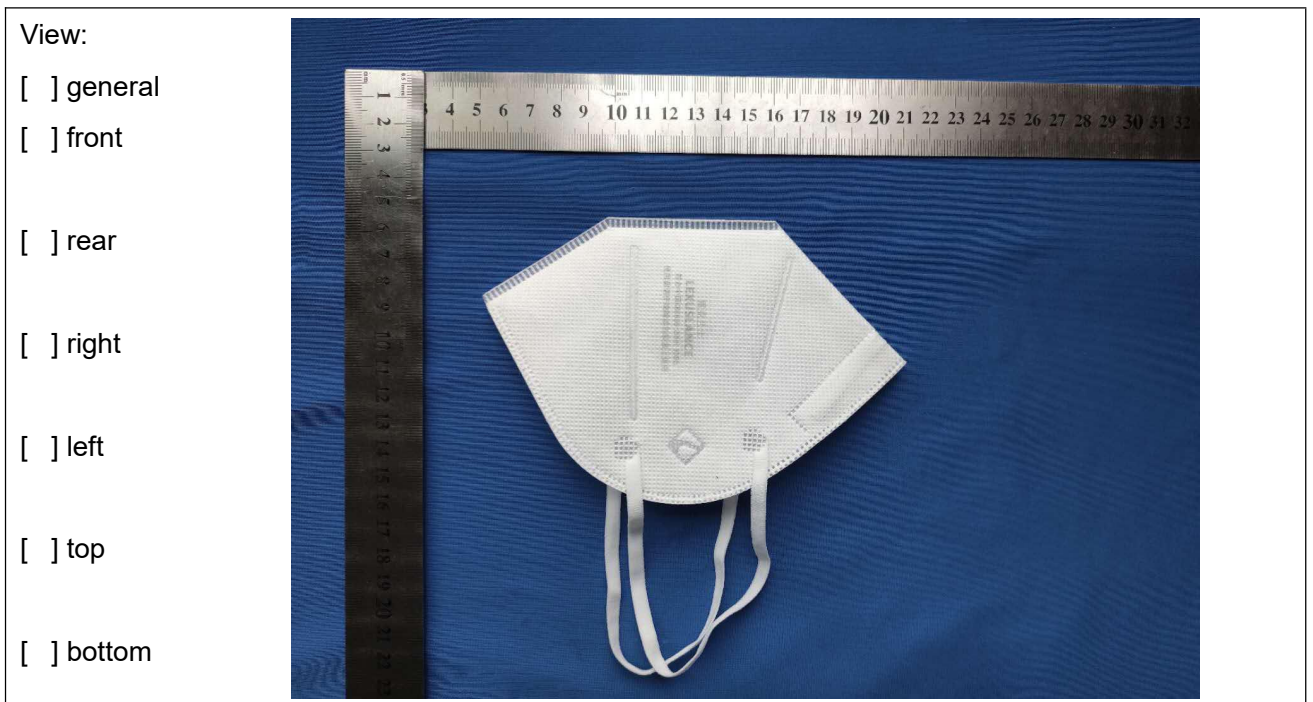
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Details of: General View



Details of: General View



---The end of report---