



## **Technical Construction File**

**File No. : 0H200310.STT0055**

According to

**Regulation (EU) 2016/425 Personal protective equipment (PPE)**

related to the

**Disposable protective mask**

**Model(s): 17.5cm X 9.5cm ( $\pm 0.5$ cm)**

presented by

Sichuan Tenor Technology Co., Ltd.

50 Nanshan Road, economic development zone, Mianyang City, Sichuan Province

# Content

|   |   |
|---|---|
| <i>1. Declaration of conformity</i> .....         | 3 |
| <i>2. General description</i> .....               | 4 |
| <i>3. Variations of the series products</i> ..... | 4 |
| <i>4. Quality control system</i> .....            | 5 |
| <i>5. Assessment of conformity</i> .....          | 6 |

***1. Declaration of conformity***

***EU Declaration of conformity***

**Council Directive Regulation (EU) 2016/425 on Personal protective equipment**

***Sichuan Tenor Technology Co., Ltd.***

50 Nanshan Road, economic development zone, Mianyang City, Sichuan Province

Certify that the product described is in conformity with the Directive Regulation (EU) 2016/425 &PPE as amended

**Product Name :Disposable protective mask**

**Models: 17.5cm X 9.5cm ( $\pm 0.5$ cm)**

The product has been assessed by the application of the following standards:

EN 149:2001+A1:2009

\_\_\_\_\_  
Issue place and date

\_\_\_\_\_  
Signature of authorized personnel

## ***2. General description***

This product is a kind of disposable protective mask.

Product performance structure and composition : This product is made of non-woven fabric, BFE99, melt blown cloth and other hot pressing

Basically, this kind of product belongs to general product and with low risk when using it. All possible risks have been analysis after assessment of conformity report and been prevent by suitable ways. The main risk of this kind of product could be ignoring the type characteristics to the product.

In addition to the safety of the product mentioned above, the compliance of PPE directive is main important part of putting CE mark on the product. As for the compliance of PPE the inspection and quality control carried out. All inspection information is included in this technical construction file. In order to ensure the conformity for CE marking for these products, some main European and/or International directive and standards have been used to made assessment of conformity.

EN 149:2001+A1:2009 Respiratory protective devices — Filtering half masks to protect against particles — Requirements, testing, marking

## ***3. Variations of the series products***

Regarding the whole family of the series, they can be divided into various different groups according to their function.

All models are with the same machine structure but with some small differences as described as the following:

1. The products dimension is different.
2. The shape of the color is different.

To present the conformity of this series helmets with Personal Protective Equipment Directive, we discuss the conformity systematically with the relative Directive and standards for 17.5cm X 9.5cm as a basic evaluation in clause.

#### ***4. Quality control system***

In order to ensure the conformity of the series production, the **Sichuan Tenor Technology Co., Ltd.** has taken the related procedures mentioned below :

( 1 ) Apply for the consultant form the qualified body in Italy.

The RUNLING has applied for the consultant from Technical Inspection Certification. The complete technical construction file ( TCF ) have been established before applying for the CE marking certificate.

( 2 ) Carry out the inspection for parts and components according to the TCF

Before the assemblies of the series production, the QC engineers of Sichuan Tenor Technology Co., Ltd. has to check and inspect the technical specifications and intended functions of parts and components to ensure the correct use of them according to the contents of TCF and principle described in the related technical information.

( 3 ) Carry out the inspection & testing for the products before packing

Before packing the products, the QC engineers of Sichuan Tenor Technology Co., Ltd. have to do the necessary inspection and testing to ensure the conformity of related requirements. In particular, they should do the testing and inspection of electrical characteristics and outer feature.

( 4 ) Carry out the inspection for the package.

After finishing the necessary inspection and testing for the products, an inspection for the packing has to be done to ensure the necessary elements being included in this packing before shipment.

( 5 ) Provision for the change of design

Any change of the products described in this TCF must be checked in detail and written down again in the TCF by the designer of Sichuan Tenor Technology Co., Ltd. if the change may effects the related electrical or mechanical characteristics.

( 6 ) Provision for the Quality Assurance

For the provisions of internal control measures to ensure the conformity of series production of the machines, Sichuan Tenor Technology Co., Ltd. has built an internal quality control system in accordance with the international standard of ISO-9001.

### 5. Assessment of conformity

| Clause                                   | Requirement-Test  | Verdict and Result-Remark                            |
|--|---|--|
| ESSENTIAL HEALTH AND SAFETY REQUIREMENTS |   | Pass   |
| PRELIMINARY REMARKS                      |   | Pass   |
| 1.                                       | The essential health and safety requirements laid down in this Regulation are compulsory.   | Pass.<br>These requirements have been complied with. |
| 2.                                       | Obligations related to essential health and safety requirements apply only where the corresponding risk exists for the PPE in question.   | Pass.<br>These requirements have been complied with. |
| 3.                                       | The essential health and safety requirements are to be interpreted and applied in such a way as to take into account the state of the art and current practice at the time of design and manufacture, as well as technical and economic considerations which are consistent with a high degree of health and safety protection. | Pass.<br>These requirements have been complied with. |
| 4.                                       | The manufacturer shall carry out a risk assessment in order to identify the risks which apply to his PPE. He shall then design and manufacture it taking into account that assessment.  | Pass.<br>These requirements have been complied with. |
| 5.                                       | When designing and manufacturing the PPE, and when drafting the instructions, the manufacturer shall envisage not only the intended use of the PPE, but also the reasonably foreseeable uses. Where applicable, the health and safety of persons other than the user shall be ensured.  | Pass.<br>These requirements have been complied with. |
| 1  | GENERAL REQUIREMENTS APPLICABLE TO ALL PPE<br>PPE must provide adequate protection against all risks encountered.   | Pass.<br>These requirements have been complied with. |
| 1.1.                                     | Design principles   | Pass.  |
| 1.1.1.                                   | Ergonomics<br>PPE must be so designed and manufactured that in the foreseeable conditions of use for which it is intended the user can perform the risk-related activity normally whilst enjoying appropriate protection of the highest possible level.   | Pass.<br>These requirements have been complied with. |
| 1.1.2.                                   | Levels and classes of protection  | Pass.  |
| 1.1.2.1                                  | Highest level of protection possible<br>The optimum level of protection to be taken into account in the design is that beyond which the constraints imposed by the wearing of the PPE would prevent its effective use during the period of exposure to the risk or normal performance of the activity.                          | Pass.<br>These requirements have been complied with. |
| 1.1.2.2.                                 | Classes of protection appropriate to different levels of risk<br>Where differing foreseeable conditions of use are  | Pass.<br>These requirements have been complied with. |

| Clause  | Requirement-Test   | Verdict and Result-Remark                            |
|---------|--|--|
|         | such that several levels of the same risk can be distinguished, appropriate classes of protection must be taken into account in the design of the PPE.   |  |
| 1.2     | Innocuousness of PPE   | Pass.  |
| 1.2.1   | Absence of risks and other 'inherent' nuisance factors<br>PPE must be so designed and manufactured as to preclude risks and other nuisance factors under foreseeable conditions of use.  | Pass.<br>These requirements have been complied with. |
| 1.2.1.1 | Suitable constituent materials<br>PPE materials and parts, including any of their decomposition products, must not adversely affect user hygiene or health.  | Pass.<br>These requirements have been complied with. |
| 1.2.1.2 | Satisfactory surface condition of all PPE parts in contact with the user<br>Any PPE part in contact or in potential contact with the user when such equipment is worn must be free of roughness, sharp edges, projections and the like which could cause excessive irritation or injuries.   | Pass.<br>These requirements have been complied with. |
| 1.2.1.3 | Maximum permissible user impediment<br>Any impediment caused by PPE to movements to be made, postures to be adopted and sensory perception must be minimized; nor must PPE cause movements which endanger the user or other persons.   | Pass.<br>These requirements have been complied with. |
| 1.3     | Comfort and efficiency   | Pass.  |
| 1.3.1   | Adaptation of PPE to user morphology<br>PPE must be so designed and manufactured as to facilitate correct positioning on the user and to remain in place for the foreseeable period of use, bearing in mind ambient factors, movements to be made and postures to be adopted. For this purpose, it must be possible to optimize PPE adaptation to user morphology by all appropriate means, such as adequate adjustment and attachment systems or the provision of an adequate size range. | Pass.<br>These requirements have been complied with. |
| 1.3.2   | Lightness and design strength<br>PPE must be as light as possible without prejudicing design strength and efficiency.<br>Apart from the specific additional requirements which they must satisfy in order to provide adequate protection against the risks in question (see 3), PPE must be capable of withstanding the effects of ambient phenomena inherent under the foreseeable conditions of use.   | Pass.<br>These requirements have been complied with. |
| 1.3.3.  | Compatibility of different classes or types of PPE designed for simultaneous use<br>If the same manufacturer markets several PPE   | Pass.<br>These requirements have been complied with. |

| Clause | Requirement-Test  | Verdict and Result-Remark                                       |
|--------|---|---|
|        | models of different classes or types in order to ensure the simultaneous protection of adjacent parts of the body against combined risks, these must be compatible.   |   |
| 1.4.   | <p>Information supplied by the manufacturer</p> <p>In addition to the name and address of the manufacturer and/or his authorized representative established in the Community, the notes that must be drawn up by the former and supplied when PPE is placed on the market must contain all relevant information on:</p> <p>(a) storage, use, cleaning, maintenance, servicing and disinfection. Cleaning, maintenance or disinfectant products recommended by manufacturers must have no adverse effect on PPE or users when applied in accordance with the relevant instructions;</p> <p>(b) performance as recorded during technical tests to check the levels or classes of protection provided by the PPE in question;</p> <p>(c) suitable PPE accessories and the characteristics of appropriate spare parts;</p> <p>(d) the classes of protection appropriate to different levels of risk and the corresponding limits of use;</p> <p>(e) the obsolescence deadline or period of obsolescence of PPE or certain of its components;</p> <p>(f) the type of packaging suitable for transport;</p> <p>(g) the significance of any markings (see 2.12).</p> <p>These notes, which must be precise and comprehensible, must be provided at least in the official language(s) of the Member State of destination.</p> | <p>Pass.</p> <p>These requirements have been complied with.</p> |
| 2      | ADDITIONAL REQUIREMENTS COMMON TO SEVERAL CLASSES OR TYPES OF PPE   | Pass.   |
| 2.1    | <p>PPE incorporating adjustment systems</p> <p>If PPE incorporates adjustment systems, the latter must be so designed and manufactured as not to become incorrectly adjusted without the user's knowledge under the foreseeable conditions of use.</p>  | <p>Pass.</p> <p>These requirements have been complied with.</p> |
| 2.2    | <p>PPE 'enclosing' the parts of the body to be protected</p> <p>As far as possible, PPE 'enclosing' the parts of the body to be protected must be sufficiently ventilated to limit perspiration resulting from use; if this is not the case, it must if possible be equipped with devices which absorb perspiration.</p>  | <p>Pass.</p> <p>These requirements have been complied with.</p> |
| 2.3    | <p>PPE for the face, eyes and respiratory tracts</p> <p>Any restriction of the user's field of vision or sight by PPE for the face, eyes or respiratory tract must</p>  | Not applicable  |

| Clause | Requirement-Test  | Verdict and Result-Remark                                       |
|--------|---|---|
|        | <p>be minimized.</p> <p>The degree of optical neutrality of the vision systems of these PPE classes must be compatible with the type of relatively meticulous and/or prolonged activities of the user.</p> <p>If necessary, they must be treated or provided with facilities to prevent moisture formation.</p> <p>PPE models intended for users requiring sight correction must be compatible with the wearing of spectacles or contact lenses.</p>  |   |
| 2.4    | <p>PPE subject to ageing</p> <p>If it is known that the design performances of new PPE may be significantly affected by ageing, the date of manufacture and/or, if possible, the date of obsolescence, must be indelibly inscribed on every PPE item or interchangeable component placed on the market in such a way as to preclude any misinterpretation; this information must also be indelibly inscribed on the packaging.</p> <p>If a manufacturer is unable to give an undertaking with regard to the useful life of PPE, his notes must provide all the information necessary to enable the purchaser or user to establish a reasonable obsolescence date, bearing in mind the quality level of the model and the effective conditions of storage, use, cleaning, servicing and maintenance.</p> <p>Where appreciable and rapid deterioration in PPE performance is likely to be caused by ageing resulting from the periodic use of a cleaning process recommended by the manufacturer, the latter must, if possible, affix a mark to each item of PPE placed on the market indicating the maximum number of cleaning operations that may be carried out before the equipment needs to be inspected or discarded; failing that, the manufacturer must give this information in his notes.</p> | <p>Pass.</p> <p>These requirements have been complied with.</p> |
| 2.5    | <p>PPE which may be caught up during use</p> <p>Where the foreseeable conditions of use include in particular the risk of the PPE being caught up by a moving object thereby creating a danger for the user, the PPE must possess an appropriate resistance threshold above which a constituent part will break and eliminate the danger.</p>   | <p>Pass.</p> <p>These requirements have been complied with.</p> |
| 2.6    | <p>PPE for use in explosive atmospheres</p> <p>PPE intended for use in explosive atmospheres must be so designed and manufactured that it cannot be the source of an electric, electrostatic or impact-induced arc or spark likely to cause an explosive mixture to ignite.</p>   | <p>Not applicable</p>   |

| Clause | Requirement-Test  | Verdict and Result-Remark                                       |
|--------|---|---|
| 2.7    | <p>PPE intended for emergency use or rapid installation and/or removal</p> <p>These PPE classes must be so designed and manufactured as to minimize the time required for attachment and (or) removal.</p> <p>Any integral systems permitting correct positioning on, or removal from, the user must be susceptible of rapid and easy operation.</p>  | <p>Pass.</p> <p>These requirements have been complied with.</p> |
| 2.8.   | <p>PPE for use in very dangerous situations</p> <p>The information notes supplied by the manufacturer together with PPE for use in the very dangerous situations referred to in Article 8 (4) (a) must include, in particular, data intended for the exclusive use of competent trained individuals who are qualified to interpret them and ensure their application by the user.</p> <p>They must also describe the procedure to be adopted in order to verify that PPE is correctly adjusted and functional when worn by the user.</p> <p>If PPE incorporates an alarm which is activated in the absence of the level of protection normally provided, this must be so designed and accommodated as to be perceived by the user in the conditions of use for which the PPE is marketed.</p> | <p>Not applicable</p>   |
| 2.9.   | <p>PPE incorporating components which can be adjusted or removed by the user</p> <p>Any PPE components which can be adjusted or removed by the user for the purpose of replacement must be so designed and manufactured as to facilitate adjustment, attachment and removal without tools.</p>  | <p>Pass.</p> <p>These requirements have been complied with.</p> |
| 2.10.  | <p>PPE for connection to another, external complementary device</p> <p>If PPE incorporates a system permitting connection to another, complementary, device, the attachment mechanism must be so designed and manufactured as to enable it to be mounted only on appropriate equipment.</p>   | <p>Pass.</p> <p>These requirements have been complied with.</p> |
| 2.11.  | <p>PPE incorporating a fluid circulation system</p> <p>If PPE incorporates a fluid circulation system, the latter must be so chosen, or designed, and incorporated as to permit adequate fluid renewal in the vicinity of the entire part of the body to be protected, irrespective of user gestures, posture or movement under the foreseeable conditions of use.</p>  | <p>Pass.</p> <p>These requirements have been complied with.</p> |
| 2.12.  | <p>PPE bearing one or more identification or recognition marks directly or indirectly relating to health and safety</p> <p>The identification or recognition marks directly or</p>  | <p>Pass.</p> <p>These requirements have been complied with.</p> |

| Clause   | Requirement-Test   | Verdict and Result-Remark                            |
|----------|--|--|
|          | indirectly relating to health and safety affixed to these types or classes of PPE must preferably take the form of harmonized pictograms or ideograms and must remain perfectly legible throughout the foreseeable useful life of the PPE. In addition, these marks must be complete, precise and comprehensible so as to prevent any misinterpretation; in particular, when such marks incorporate words or sentences, the latter must appear in the official language(s) of the Member State where the equipment is to be used. If PPE (or a PPE component) is too small to allow all or part of the necessary marking to be affixed, the relevant information must be mentioned on the packing and in the manufacturer's notes. |  |
| 2.13.    | PPE in the form of clothing capable of signalling the user's presence visually<br>PPE in the form of clothing intended for foreseeable conditions of use in which the user's presence must be visibly and individually signalled must have one (or more) judiciously positioned means of or devices for emitting direct or reflected visible radiation of appropriate luminous intensity and photometric and colorimetric properties.  | Pass.<br>These requirements have been complied with. |
| 2.14.    | 'Multi-risk' PPE<br>All PPE designed to protect the user against several potentially simultaneous risks must be so designed and manufactured as to satisfy, in particular, the basic requirements specific to each of those risks (see 3).   | Pass.<br>These requirements have been complied with. |
| 3.       | ADDITIONAL REQUIREMENTS SPECIFIC TO PARTICULAR RISKS   | Pass.  |
| 3.1.     | Protection against mechanical impact   | Pass   |
| 3.1.1.   | Impact caused by falling or projecting objects and collision of parts of the body with an obstacle<br>Suitable PPE for this type of risk must be sufficiently shock-absorbent to prevent injury resulting, in particular, from the crushing or penetration of the protected part, at least up to an impact-energy level above which the excessive dimensions or mass of the absorbing device would preclude effective use of the PPE for the foreseeable period of wear.   | Pass.<br>These requirements have been complied with. |
| 3.1.2.   | Falls  | Pass   |
| 3.1.2.1. | Prevention of falls due to slipping<br>The outsoles for footwear designed to prevent slipping must be so designed, manufactured or equipped with added elements as to ensure satisfactory adhesion by grip and friction having   | Pass.<br>These requirements have been complied with. |

| Clause   | Requirement-Test   | Verdict and Result-Remark                                    |
|----------|--|--|
|          | regard to the nature or state of the surface.  |  |
| 3.1.2.2. | <p>Prevention of falls from a height<br/> PPE designed to prevent falls from a height or their effects must incorporate a body harness and an attachment system which can be connected to a reliable anchorage point. It must be designed so that under the foreseeable conditions of use the vertical drop of the user is minimized to prevent collision with obstacles and the braking force does not, however, attain the threshold value at which physical injury or the tearing or rupture of any PPE component which might cause the user to fall can be expected to occur.</p> <p>It must also ensure that after braking the user is maintained in a correct position in which he may await help if necessary.</p> <p>The manufacturer's notes must specify in particular all relevant information relating to:</p> <ul style="list-style-type: none"> <li>- the characteristics required for the reliable anchorage point and the necessary minimum clearance below the user,</li> <li>- the proper way of putting on the body harness and of connecting the attachment system to the reliable anchorage point.</li> </ul> | <p>Pass<br/> These requirements have been complied with.</p> |
| 3.1.3.   | <p>Mechanical vibration<br/> PPE designed to prevent the effects of mechanical vibrations must be capable of ensuring adequate attenuation of harmful vibration components for the part of the body at risk.</p> <p>Under no circumstances must the effective value of the accelerations transmitted to the user by those vibrations exceed the limit values recommended in the light of the maximum foreseeable daily exposure of the part of the body at risk.</p>   | Not applicable   |
| 3.2.     | <p>Protection against (static) compression of part of the body<br/> PPE designed to protect part of the body against (static) compressive stress must be sufficiently capable of attenuating its effects to prevent serious injury or chronic complaints.</p>  | <p>Pass<br/> These requirements have been complied with.</p> |
| 3.3.     | <p>Protection against physical injury (abrasion, perforation, cuts, bites)<br/> PPE constituent materials and other components designed to protect all or part of the body against superficial injury caused by machinery, such as abrasion, perforation, cuts or bites, must be so chosen or designed and incorporated as to ensure that these PPE classes provide sufficient resistance to abrasion, perforation and gashing (see also 3.1)</p>  | <p>Pass<br/> These requirements have been complied with.</p> |

| Clause | Requirement-Test   | Verdict and Result-Remark                                       |
|--------|--|---|
|        | under the foreseeable conditions of use.   |   |
| 3.4.   | <p>Prevention of drowning (lifejackets, armbands and lifesaving suits)</p> <p>PPE designed to prevent drowning must be capable of returning to the surface as quickly as possible, without danger to his health, a user who may be exhausted or unconscious after falling into a liquid medium, and of keeping him afloat in a position which permits breathing while awaiting help.</p> <p>PPE may be wholly or partially inherently buoyant or may be inflated either by gas which can be manually or automatically released or orally.</p> <p>Under the foreseeable conditions of use:</p> <ul style="list-style-type: none"> <li>- PPE must, without prejudice to its satisfactory operation, be capable of withstanding the effects of impact with the liquid medium and the environmental factors inherent in that medium,</li> <li>- inflatable PPE must be capable of inflating rapidly and fully.</li> </ul> <p>Where particular foreseeable conditions of use so require, certain types of PPE must also satisfy one or more of the following additional requirements:</p> <ul style="list-style-type: none"> <li>- it must have all the inflation devices referred to in the second subparagraph, and/or a light or sound-signalling device,</li> <li>- it must have a device for hitching and attaching the body so that the user may be lifted out of the liquid medium,</li> <li>- it must be suitable for prolonged use throughout the period of activity exposing the user, possibly dressed, to the risk of falling into the liquid medium or requiring his immersion in it.</li> </ul> | Not applicable  |
| 3.4.1. | <p>Buoyancy aids</p> <p>Clothing which will ensure an effective degree of buoyancy, depending on its foreseeable use, which is safe when worn and which affords positive support in water. In foreseeable conditions of use, this PPE must not restrict the user's freedom of movement but must enable him, in particular, to swim or take action to escape from danger or rescue other persons.</p>   | Not applicable.   |
| 3.5.   | <p>Protection against the harmful effects of noise</p> <p>PPE designed to prevent the harmful effects of noise must be capable of attenuating the latter to such an extent that the equivalent sound levels perceived by the user do not under any circumstances exceed the daily limit values laid down by Council Directive 86/188/EEC of 12 May 1986 on the protection of workers from the risks</p>  | <p>Pass.</p> <p>These requirements have been complied with.</p> |

| Clause | Requirement-Test  | Verdict and Result-Remark                                      |
|--------|---|--|
|        | <p>related to exposure to noise at work (;).</p> <p>All PPE must bear labelling indicating the noise attenuation level and the value of the comfort index provided by the PPE; should this not be possible, the labelling must be fixed to the packaging.</p>   |  |
| 3.6.   | <p>Protection against heat and/or fire</p> <p>PPE designed to protect all or part of the body against the effects of heat and/or fire must possess thermal insulation capacity and mechanical strength appropriate to foreseeable conditions of use.</p>  | <p>Pass</p> <p>These requirements have been complied with.</p> |
| 3.6.1. | <p>PPE constituent materials and other components</p> <p>Constituent materials and other components suitable for protection against radiant and convective heat must possess an appropriate coefficient of transmission of incident heat flux and be sufficiently incombustible to preclude any risk of spontaneous ignition under the foreseeable conditions of use.</p> <p>Where the outside of these materials and components must be reflective, its reflective power must be appropriate to the intensity of the heat flux due to radiation in the infra-red range.</p> <p>Materials and other components of equipment intended for brief use in high-temperature environments and of PPE which may be splashed by hot products such as large quantities of molten material must also possess sufficient thermal capacity to retain most of the stored heat until after the user has left the danger area and removed his PPE.</p> <p>PPE materials and other components which may be splashed by large amounts of hot products must also possess sufficient mechanical-impact absorbency (see 3.1).</p> <p>PPE materials and other components which may accidentally come into contact with flame and those used in the manufacture of fire-fighting equipment must also possess a degree of non-flammability corresponding to the risk class associated with the foreseeable conditions of use. They must not melt when exposed to flames nor contribute to flame propagation.</p> | <p>Pass</p> <p>These requirements have been complied with.</p> |
| 3.6.2. | <p>Complete PPE ready for use</p> <p>Under the foreseeable conditions of use:</p> <p>1. the quantity of heat transmitted by PPE to the user must be sufficiently low to prevent the heat accumulated during wear in the part of the body at risk from attaining, under any circumstances, the</p>   | <p>Pass</p> <p>These requirements have been complied with.</p> |

| Clause | Requirement-Test   | Verdict and Result-Remark                                       |
|--------|--|---|
|        | <p>pain or health impairment threshold;</p> <p>2. PPE must if necessary prevent liquid or steam penetration and must not cause burns resulting from contact between its protective integument and the user.</p> <p>If PPE incorporates refrigeration devices for the absorption of incident heat by means of liquid evaporation or solid sublimation, their design must be such that any volatile substances released are discharged beyond the outer protective integument and not towards the user.</p> <p>If PPE incorporates a breathing device, the latter must adequately fulfil the protective function assigned to it under the foreseeable conditions of use.</p> <p>The manufacturer's notes accompanying each PPE model intended for brief use in high-temperature environments must in particular provide all relevant data for the determination of the maximum permissible user exposure to the heat transmitted by the equipment when used in accordance with its intended purpose.</p> |   |
| 3.7.   | <p>Protection against cold</p> <p>PPE designed to protect all or part of the body against the effects of cold must possess thermal insulating capacity and mechanical strength appropriate to the foreseeable conditions of use for which it is marketed.</p>  | <p>Pass.</p> <p>These requirements have been complied with.</p> |
| 3.7.1. | <p>PPE constituent materials and other components</p> <p>Constituent materials and other components suitable for protection against cold must possess a coefficient of transmission of incident thermal flux as low as required under the foreseeable conditions of use. Flexible materials and other components of PPE intended for use in a low-temperature environment must retain the degree of flexibility required for the necessary gestures and postures. PPE materials and other components which may be splashed by large amounts of cold products must also possess sufficient mechanical-impact absorbency (see 3.1).</p>  | <p>Pass</p> <p>These requirements have been complied with.</p>  |
| 3.7.2. | <p>Complete PPE ready for use</p> <p>Under the foreseeable conditions of use:</p> <p>1. the flux transmitted by PPE to the user must be sufficiently low to prevent the cold accumulated during wear at any point on the part of the body being protected, including the tips of fingers and toes in the case of hands or feet, from attaining, under any circumstances, the pain or</p>   | <p>Pass</p> <p>These requirements have been complied with.</p>  |

| Clause | Requirement-Test   | Verdict and Result-Remark                                      |
|--------|--|--|
|        | <p>health-impairment threshold;</p> <p>2. PPE must as far as possible prevent the penetration of such liquids as rain water and must not cause injuries resulting from contact between its cold protective integument and the user. If PPE incorporates a breathing device, this must adequately fulfil the protective function assigned to it under the foreseeable conditions of use. The manufacturer's notes accompanying each PPE model intended for brief use in low-temperature environments must provide all relevant data concerning the maximum permissible user exposure to the cold transmitted by the equipment.</p>  |  |
| 3.8.   | <p>Protection against electric shock</p> <p>PPE designed to protect all or part of the body against the effects of electric current must be sufficiently insulated against the voltages to which the user is likely to be exposed under the most unfavourable foreseeable conditions. To this end, the constituent materials and other components of these PPE classes must be so chosen or designed and incorporated as to ensure that the leakage current measured through the protective integument under test conditions at voltages correlated with those likely to be encountered in situ is minimized and, at all events, below a maximum conventional permissible value which correlates with the tolerance threshold. Together with their packaging, PPE types intended exclusively for use during work or activities in electrical installations which are or may be under tension must bear markings indicating, in particular, their protection class and (or) corresponding operating voltage, their serial number and their date of manufacture; a space must also be provided outside the protective integument of such PPE for the subsequent inscription of the date of entry into service and those of the periodic tests or inspections to be periodic tests or inspections to be conducted. The manufacturer's notes must indicate, in particular, the exclusive use for which these PPE types are intended and the nature and frequency of the dielectric tests to which they are to be subjected during their useful life.</p> | <p>Pass</p> <p>These requirements have been complied with.</p> |
| 3.9.   | Radiation protection   | Not applicable   |
| 3.9.1. | <p>Non-ionizing radiation</p> <p>PPE designed to prevent acute or chronic eye-damage from sources of non-ionizing radiation</p>  | Not applicable   |

| Clause   | Requirement-Test   | Verdict and Result-Remark |
|----------|--|---------------------------|
|          | <p>must be capable of absorbing or reflecting the majority of the energy radiated in the harmful wavelengths without unduly affecting the transmission of the innocuous part of the visible spectrum, the perception of contrasts and the ability to distinguish colours where required by the foreseeable conditions of use.</p> <p>To this end, protective glasses must be so designed and manufactured as to possess, for each harmful wave, a spectral transmission factor such that the radiant-energy illumination density capable of reaching the user's eye through the filter is minimized and, under no circumstances, exceeds the maximum permissible exposure value.</p> <p>Furthermore, the glasses must not deteriorate or lose their properties as a result of the effects of radiation emitted under the foreseeable conditions of use and all marketed specimens must bear the protection-factor number corresponding to the spectral distribution curve of their transmission factor.</p> <p>Glasses suitable for radiation sources of the same type must be classified in the ascending order of their protection factors and the manufacturer's notes must indicate, in particular, the transmission curves which make it possible to select the most appropriate PPE bearing in mind such inherent factors of the effective conditions of use as distance to source and the spectral distribution of the energy radiated at that distance.</p> <p>The relevant protection-factor number must be marked on all specimens of filtering glasses by the manufacturer.</p> |                           |
| 3.9.2    | Ionizing radiation   | Not applicable            |
| 3.9.2.1. | <p>Protection against external radioactive contamination</p> <p>PPE constituent materials and other components designed to protect all or part of the body against radioactive dust, gases, liquids or mixtures thereof must be so chosen or designed and incorporated as to ensure that this equipment effectively prevents the penetration of the contaminants under the foreseeable conditions of use.</p> <p>Depending on the nature or condition of these contaminants, the necessary leak-tightness can be provided by the impermeability of the protective integument and/or by any other appropriate means, such as ventilation and pressurization systems designed to prevent the back-scattering of these</p>  | Not applicable            |

| Clause   | Requirement-Test   | Verdict and Result-Remark                                   |
|----------|--|---|
|          | <p>contaminants.<br/>Any decontamination measures to which PPE is subject must not prejudice its possible re-use during the foreseeable useful life of these classes of equipment.</p>   |   |
| 3.9.2.2. | <p>Limited protection against external irradiation<br/>PPE intended to provide complete user protection against external irradiation or, failing this, adequate attenuation thereof, must be designed to counter only weak electron (e.g. beta) or weak photon (e.g. X, gamma) radiation.<br/>The constituent materials and other components of these PPE classes must be so chosen or designed and incorporated as to provide the degree of user protection required by the foreseeable conditions of use without leading to an increase in exposure time as a result of the impedance of user gestures, posture or movement (see 1.3.2).<br/>PPE must bear a mark indicating the type and thickness of the constituent material(s) suitable for the foreseeable conditions of use.</p>   | Not applicable  |
| 3.10.    | Protection against dangerous substances and infective agents   | Pass  |
| 3.10.1.  | <p>Respiratory protection<br/>PPE intended for the protection of the respiratory tract must make it possible to supply the user with breathable air when the latter is exposed to a polluted atmosphere and/or an atmosphere having inadequate oxygen concentration.<br/>The breathable air supplied to the user by the PPE must be obtained by appropriate means, for example after filtration of the polluted air through the protective device or appliance or by a piped supply from an unpolluted source.<br/>The constituent materials and other components of these PPE classes must be so chosen or designed and incorporated as to ensure appropriate user respiration and respiratory hygiene for the period of wear concerned under the foreseeable conditions of use.<br/>The leak-tightness of the facepiece and the pressure drop on inspiration and, in the case of the filtering devices, purification capacity must be such as to keep contaminant penetration from a polluted atmosphere low enough not to be prejudicial to the health or hygiene of the user.<br/>The PPE must bear the manufacturer's identification mark and details of the specific characteristics of that type of equipment which, in</p> | <p>Pass<br/>These requirements have been complied with.</p> |

| Clause  | Requirement-Test  | Verdict and Result-Remark                                      |
|---------|---|--|
|         | <p>conjunction with the instructions for use, will enable a trained and qualified user to employ the PPE correctly.</p> <p>The manufacturer's notes must also in the case of filtering devices, indicate the deadline for the storage of filters as new and kept in their original packaging.</p>   |  |
| 3.10.2. | <p>Protection against cutaneous and ocular contact PPE intended to prevent the surface contact of all or part of the body with dangerous substances and infective agents must be capable of preventing the penetration or diffusion of such substances through the protective integument under the foreseeable conditions of use for which the PPE is placed on the market.</p> <p>To this end, the constituent materials and other components of these PPE classes must be so chosen, or designed and incorporated as to ensure, as far as possible, complete leak-tightness, which will allow where necessary prolonged daily use or, failing this, limited leak-tightness necessitating a restriction of the period of wear.</p> <p>Where, by virtue of their nature and the foreseeable conditions of their use, certain dangerous substances or infective agents possess high penetrative power which limits the duration of the protection provided by the PPE in question, the latter must be subjected to standard tests with a view to their classification on the basis of efficiency. PPE which is considered to be in conformity with the test specifications must bear a mark indicating, in particular, the names or, failing this, the codes of the substances used in the tests and the corresponding standard period of protection. The manufacturer's notes must also contain, in particular, an explanation of the codes (if necessary), a detailed description of the standard tests and all appropriate information for the determination of the maximum permissible period of wear under the different foreseeable conditions of use.</p> | <p>Pass</p> <p>These requirements have been complied with.</p> |
| 3.11.   | <p>Diving equipment</p> <p>The breathing equipment must make it possible to supply the user with a breathable gaseous mixture, under foreseeable conditions of use and taking account in particular of the maximum depth of immersion.</p> <p>Where the foreseeable conditions of use so require, the diving equipment must comprise the following:</p>   | <p>Not applicable</p>  |

| Clause | Requirement-Test   | Verdict and Result-Remark |
|--------|--|---------------------------|
|        | (a)a suit which protects the user against cold (see point 3.7) and/or pressure resulting from the depth of immersion (see point 3.2);<br>(b)an alarm designed to give the user prompt warning of an approaching failure in the supply of breathable gaseous mixture (see point 2.8);<br>(c)a lifesaving device enabling the user to return to the surface (see point 3.4.1). |                           |

Confirmed By: *Downey Xue*

Date: 2020-03-08

# TEST REPORT

## EN 149:2001+A1:2009 Respiratory protective devices — Filtering half masks to protect against particles — Requirements, testing, marking

**Report**

Report reference No. .... : 0H200310.STT0055

Tested by(+ signature).....: *Downay Xue*

Reviewed by(+ signature).....: *Erno Shijiang*

Date of issue ..... : 2020-03-08

Number of pages (Report) ..... : 26

**Manufacturer:**

Name .....:Sichuan Tenor Technology Co., Ltd.

Address.....:50 Nanshan Road, economic development zone, Mianyang  
City, Sichuan Province

**Test specification**

Standard ..... : EN 149:2001+A1:2009

Test procedure ..... : CE-PPE

Procedure deviation ..... : N.A.

Non-standard test method ..... : N.A.

**General descriptions**

This product is a kind of Disposable Protective Mask.

Product performance structure and composition : This product is made of non-woven fabric, BFE99, melt blown cloth and other hot pressing.

Brief description of the tested sample(s):

Ambient temperature: 22°C

humidity: 60%

Complete test was conducted on RL-002.

**Conclusion**

The machine met these requirements of EN 149:2001+A1:2009 standard.

| Clause | Requirement-Test   | Verdict and Result-Remark                            |
|--------|--|--|
| 5.     | The essential health and safety requirements laid down in this Regulation are compulsory.  | Pass.  |
|        | Particle filtering half masks are classified according to their filtering efficiency and their maximum total inward leakage. There are three classes of devices:<br>FFP1, FFP2 and FFP3.<br>The protection provided by an FFP2 - or FFP3 - device includes that provided by the device of lower class or classes.<br>!In addition, particle filtering half masks are classified as single shift use only or as re-usable (more than one shift) | Pass.<br>FFP2  |
| 6.     | Designation  | Pass.  |
|        | Particle filtering half masks meeting the requirements of this European Standard shall be designated in the following manner:<br>!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)."  | Pass.<br>These requirements have been complied with. |
| 7.     | Requirements   | Pass.  |
| 7.1    | Genera   | Pass.  |
|        | In all tests all test samples shall meet the requirements  | Pass.  |
| 7.2    | Nominal values and tolerances  | Pass.  |
|        | 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) °C, and the temperature limits shall be subject to an accuracy of $\pm 1$ °C.  | Pass.<br>These requirements have been complied with. |
| 7.3    | Visual inspection  | Pass.  |
|        | The visual inspection shall also include the marking and the information supplied by the manufacturer.   | Pass.<br>These requirements have been complied with. |
| 7.4    | Packaging  | Pass.  |
|        | 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.<br>Testing shall be done in accordance with 8.2.  | Pass.<br>These requirements have been complied with. |
| 7.5    | Material   | Pass.  |

| Clause | Requirement-Test  | Verdict and Result-Remark                                       |
|--------|---|---|
|        | <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> <p>Three particle filtering half masks shall be tested. When conditioned in accordance with 8.3.1 and 8.3.2 the particle filtering half mask shall not collapse.</p> <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.</p> <p>Testing shall be done in accordance with 8.2.</p> | <p>Pass.</p> <p>These requirements have been complied with.</p> |
| 7.6    | Cleaning and disinfecting   | Pass.   |
|        | <p>!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."</p> <p>Testing shall be done in accordance with 8.4 and 8.5.</p> <p>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.</p> <p>Testing shall be done in accordance with 8.11."</p>   | <p>Pass.</p> <p>These requirements have been complied with.</p> |
| 7.7    | Practical performance   | Pass.   |
|        | <p>The particle filtering half mask shall undergo practical performance tests under realistic conditions.</p> <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> <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.</p> <p>Testing shall be done in accordance with 8.4.</p>  | <p>Pass.</p> <p>These requirements have been complied with.</p> |
| 7.8    | Finish of parts   | Pass.   |
|        | <p>Parts of the device likely to come into contact with the wearer shall have no sharp edges or burrs.</p> <p>Testing shall be done in accordance with 8.2.</p>   | <p>Pass.</p> <p>These requirements have been complied with.</p> |
| 7.9    | Leakage   | Pass.   |
| 7.9.1  | Total inward leakage  | Pass.   |
|        | <p>The laboratory tests shall indicate that the particle filtering half mask can be used by the wearer to</p>   | <p>Pass.</p> <p>These requirements have been</p>                |

| Clause         | Requirement-Test   | Verdict and Result-Remark                            |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
|----------------|--|--|--|--|--|---|------|----|----|------|---|---|------|---|---|---------------|
|                | protect with high probability against the potential hazard to be expected.<br>The total inward leakage consists of three components: face seal leakage, exhalation valve leakage (if exhalation valve fitted) and filter penetration.  | complied with.                                       |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
| 7.9.2          | Penetration of filter material   | Pass   |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
|                | The penetration of the filter of the particle filtering half mask shall meet the requirements of Table 1.<br><table border="1" data-bbox="331 584 970 741"> <caption>Table 1 — Penetration of filter material</caption> <thead> <tr> <th rowspan="2">Classification</th> <th colspan="2">E) Maximum penetration of test aerosol (%)</th> </tr> <tr> <th>Sodium chloride test 95 l/min<br/>%<br/>max.</th> <th>Paraffin oil test 95 l/min<br/>%<br/>max.</th> </tr> </thead> <tbody> <tr> <td>FFP1</td> <td>20</td> <td>20</td> </tr> <tr> <td>FFP2</td> <td>6</td> <td>6</td> </tr> <tr> <td>FFP3</td> <td>1</td> <td>1</td> </tr> </tbody> </table> | Classification                                       | E) Maximum penetration of test aerosol (%) |  | Sodium chloride test 95 l/min<br>%<br>max. | Paraffin oil test 95 l/min<br>%<br>max. | FFP1 | 20 | 20 | FFP2 | 6 | 6 | FFP3 | 1 | 1 | Pass.<br>FFP2 |
| Classification | E) Maximum penetration of test aerosol (%)   |  |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
|                | Sodium chloride test 95 l/min<br>%<br>max.   | Paraffin oil test 95 l/min<br>%<br>max.              |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
| FFP1           | 20   | 20   |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
| FFP2           | 6  | 6  |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
| FFP3           | 1  | 1  |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
| 7.10           | Compatibility with skin  | Pass   |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
|                | 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.<br>Testing shall be done in accordance with 8.4 and 8.5.  | Pass.<br>These requirements have been complied with. |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
| 7.11           | Flammability   | Pass.  |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
|                | The material used shall not present a danger for the wearer and shall not be of highly flammable nature.<br>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.<br>The particle filtering half mask does not have to be usable after the test.<br>Testing shall be done in accordance with 8.6.  | Pass.<br>These requirements have been complied with. |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
| 7.12           | Carbon dioxide content of the inhalation air   | Pass   |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
|                | The carbon dioxide content of the inhalation air (dead space) shall not exceed an average of 1,0 % (by volume).<br>Testing shall be done in accordance with 8.7.   | Pass.<br>These requirements have been complied with. |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
| 7.13           | Head harness   | Pass.  |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
|                | The head harness shall be designed so that the particle filtering half mask can be donned and removed easily.<br>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.<br>Testing shall be done in accordance with 8.4 and 8.5.  | Pass.<br>These requirements have been complied with. |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
| 7.14           | Field of vision  | Pass.  |  |  |  |   |      |    |    |      |   |   |      |   |   |               |
|                | The field of vision is acceptable if determined so in practical performance tests.   | Pass.<br>These requirements have been                |  |  |  |   |      |    |    |      |   |   |      |   |   |               |

| Clause         | Requirement-Test   | Verdict and Result-Remark                           |                                     |  |  |            |  |            |          |          |           |      |     |     |     |      |     |     |     |      |     |     |     |  |
|----------------|--|---|-------------------------------------|--|--|------------|--|------------|----------|----------|-----------|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|-----|--|
|                | Testing shall be done in accordance with 8.4.  | complied with.                                      |                                     |  |  |            |  |            |          |          |           |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 7.15           | Exhalation valve(s)  | Not applicable                                      |                                     |  |  |            |  |            |          |          |           |      |     |     |     |      |     |     |     |      |     |     |     |  |
|                | A particle filtering half mask may have one or more exhalation valve(s), which shall function correctly in all orientations.<br>Testing shall be done in accordance with 8.2 and 8.9.1.<br>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.<br>Testing shall be done in accordance with 8.2.          | Not applicable<br>No Exhalation valve(s)            |                                     |  |  |            |  |            |          |          |           |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 7.16           | Breathing resistance   | Pass  |                                     |  |  |            |  |            |          |          |           |      |     |     |     |      |     |     |     |      |     |     |     |  |
|                | The breathing resistances apply to valved and valveless particle filtering half masks and shall meet the requirements of Table 2.<br>Testing shall be done in accordance with 8.9.<br><b>Table 2 — Breathing resistance</b>  | Pass.<br>FFP2                                       |                                     |  |  |            |  |            |          |          |           |      |     |     |     |      |     |     |     |      |     |     |     |  |
|                | <table border="1"> <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                                 |  |  |            |  |            |          |          |           |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 7.17           | Clogging   | Pass  |                                     |  |  |            |  |            |          |          |           |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 7.17.1         | General  | Pass.   |                                     |  |  |            |  |            |          |          |           |      |     |     |     |      |     |     |     |      |     |     |     |  |
|                | For single shift use devices, the clogging test is an optional test. For re-usable devices the test is mandatory.<br>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.<br>The specified breathing resistances shall not be exceeded before the required dust load of 833 mg h/m <sup>3</sup> is reached.  | Pass<br>These requirements have been complied with. |                                     |  |  |            |  |            |          |          |           |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 7.17.2         | Breathing resistance   | Pass  |                                     |  |  |            |  |            |          |          |           |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 7.17.2.1       | Valved particle filtering half masks   | Not applicable                                      |                                     |  |  |            |  |            |          |          |           |      |     |     |     |      |     |     |     |      |     |     |     |  |
|                | After clogging the inhalation resistances shall not exceed<br>FFP1: 4 mbar<br>FFP2: 5 mbar<br>FFP3: 7 mbar<br>at 95 l/min continuous flow;<br>The exhalation resistance shall not exceed 3 mbar at 160 l/min continuous flow.<br>Testing shall be done in accordance with 8.9.   | Not applicable                                      |                                     |  |  |            |  |            |          |          |           |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 7.17.2.2       | Valveless particle filtering half masks  | Pass  |                                     |  |  |            |  |            |          |          |           |      |     |     |     |      |     |     |     |      |     |     |     |  |
|                | After clogging the inhalation and exhalation   | Pass  |                                     |  |  |            |  |            |          |          |           |      |     |     |     |      |     |     |     |      |     |     |     |  |

| Clause | Requirement-Test  | Verdict and Result-Remark                           |
|--------|---|---|
|        | resistances shall not exceed<br>FFP1: 3 mbar<br>FFP2: 4 mbar<br>FFP3: 5 mbar<br>at 95 l/min continuous flow.<br>Testing shall be done in accordance with 8.9.   | These requirements have been complied with.         |
| 7.17.3 | Penetration of filter material  | Pass.   |
|        | 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.<br>Testing shall be done in accordance with 8.11 using EN 13274-7"  | Pass<br>These requirements have been complied with. |
| 7.18   | Demountable parts   | Pass  |
|        | All demountable parts (if fitted) shall be readily connected and secured, where possible by hand.<br>Testing shall be done in accordance with 8.2.  | Pass<br>These requirements have been complied with. |
| 8      | Testing   | Pass.   |
| 8.1    | General   | Pass  |
|        | If no special measuring devices and methods are specified, commonly used devices and methods shall be used.<br>NOTE For a summary of testing, see Table 4.<br>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.   | Pass<br>These requirements have been complied with. |
| 8.2    | Visual inspection   | Pass  |
|        | The visual inspection is carried out where appropriate by the test house prior to laboratory or practical performance tests.  | Pass<br>These requirements have been complied with. |
| 8.3    | Conditioning  | Pass  |
| 8.3.1  | Simulated wearing treatment   | Pass  |
|        | Conditioning by simulated wearing treatment shall be carried out by the following process.<br>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 ± 2) °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 | Pass<br>These requirements have been complied with. |

| Clause | Requirement-Test  | Verdict and Result-Remark                           |
|--------|---|---|
|        | 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.   |   |
| 8.3.2  | Temperature conditioning  | Pass  |
|        | Expose the particle filtering half masks to the following thermal cycle:<br>a) for 24 h to a dry atmosphere of $(70 \pm 3) ^\circ\text{C}$ ;<br>b) for 24 h to a temperature of $(-30 \pm 3) ^\circ\text{C}$ ;<br>and allow to return to room temperature for at least 4 h between exposures and prior to subsequent testing.<br>The conditioning shall be carried out in a manner which ensures that no thermal shock occurs.  | Pass  |
| 8.3.3  | Mechanical strength   | Pass  |
|        | Conditioning shall be done in accordance with EN 143.   | Pass<br>These requirements have been complied with. |
| 8.3.4  | Flow conditioning   | Not applicable                                      |
|        | 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.  | Not applicable                                      |
| 8.4    | Practical performance   | Pass  |
| 8.4.1  | General   | Pass  |
|        | A total of 2 particle filtering half masks shall be tested: both as received.<br>All tests shall be carried out by two test subjects at ambient temperature and the test temperature and humidity shall be recorded.<br>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.<br>Examination shall be done in accordance with 8.2.<br>For the test, persons shall be selected who are familiar with using such or similar equipment. | Pass<br>These requirements have been complied with. |
| 8.4.2  | Walking test  | Pass  |
|        | 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.   | Pass<br>These requirements have been complied with. |

| Clause  | Requirement-Test   | Verdict and Result-Remark                                      |
|---------|--|--|
| 8.4.3   | Work simulation test   | Pass   |
|         | <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.</p> <p>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.</p> <p>a) walking on the level with headroom of <math>(1,3 \pm 0,2)</math> m for 5 min;</p> <p>b) crawling on the level with headroom of <math>(0,70 \pm 0,05)</math> m for 5 min;</p> <p>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.</p> <p>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.</p> | <p>Pass</p> <p>These requirements have been complied with.</p> |
| 8.5     | Leakage  | Pass   |
| 8.5.1   | General test procedure   | Pass   |
| 8.5.1.1 | Total inward leakage   | Pass   |
|         | <p>A total of 10 test specimens shall be tested: 5 as received and 5 after temperature conditioning in accordance with 8.3.2.</p> <p>The total inward leakage shall be tested using sodium chloride aerosol.</p> <p>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.</p> <p>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.</p>   | <p>Pass</p> <p>These requirements have been complied with.</p> |
| 8.5.1.2 | Test equipment   | Pass   |
|         | <p>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</p>  | <p>Pass</p> <p>These requirements have been complied with.</p> |

| Clause    | Requirement-Test  | Verdict and Result-Remark                                      |
|-----------|---|--|
|           | <p>homogeneous. The flow rate should be measured close to the subject's head.</p> <p>A level treadmill is required capable of working at 6 km/h.</p>  |  |
| 8.5.1.3   | Test procedure  | Pass   |
|           | <p>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.</p> <p>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.</p> <p>The test subjects shall have no indication of the results as the test proceeds.</p> <p>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.</p> <p>After each test, replace the particle filtering half mask by a new sample.</p> | <p>Pass</p> <p>These requirements have been complied with.</p> |
| 8.5.2     | Method  | Pass   |
| 8.5.2.1   | Principle   | Pass   |
|           | <p>The subject wearing the particle filtering half mask under test walks on a treadmill over which is an enclosure.</p> <p>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.</p> <p>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.</p>  | <p>Pass</p> <p>These requirements have been complied with.</p> |
| 8.5.2.2   | Test equipment (see Figure 3)   |  |
| 8.5.2.2.1 | Aerosol generator   |  |
|           | <p>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</p>  |  |

| Clause    | Requirement-Test  | Verdict and Result-Remark                           |
|-----------|---|---|
|           | 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.   |   |
| 8.5.2.2.2 | Test agent  | Pass  |
|           | 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.   | Pass<br>These requirements have been complied with. |
| 8.5.2.2.3 | Flame photometer  | Pass  |
|           | 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:<br>a) It should be a flame photometer specifically designed for the direct analysis of NaCl aerosol;<br>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> ;<br>c) The total aerosol sample required by the photometer should not be greater than 15 l/min;<br>d) The response time of the photometer, excluding the sampling system, should not be greater than 500 ms;<br>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. | Pass<br>These requirements have been complied with. |
| 8.5.2.2.4 | Sample selector   | Pass  |
|           | A system is required which will switch the sample to the photometer only during the inhalation phase of the respiratory cycle. During the exhalation phase clean air shall be fed to the photometer. The essential elements of such a system are:<br>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;<br>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   | Pass<br>These requirements have been complied with. |

| Clause    | Requirement-Test  | Verdict and Result-Remark                           |
|-----------|---|---|
|           | <p>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;</p> <p>c) An interfacing system to actuate the valve in response to a signal from the pressure sensor;</p> <p>d) timing device to record the proportion of the total respiratory cycle during which sampling took place.</p>  |   |
| 8.5.2.2.5 | Sampling probe  | Pass  |
|           | <p>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.</p> <p>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.</p> <p>Care shall be taken to ensure that the probe does not disturb the normal fit or shape of the mask.</p> | Pass<br>These requirements have been complied with. |
| 8.5.2.2.6 | Sample pump   |   |
|           | <p>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.</p>  |   |
| 8.5.2.2.7 | Sampling of enclosure concentration   |   |
|           | <p>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.</p> <p>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.</p>  |   |
| 8.5.2.2.8 | Pressure detection probe  | Pass  |
|           | A second probe is fitted near to the sample probe and is connected to the pressure sensor.  | Pass<br>These requirements have been                |

| Clause  | Requirement-Test  | Verdict and Result-Remark                                      |
|---------|---|--|
|         |   | complied with.   |
| 8.5.2.3 | Expression of results   | Pass   |
|         | <p>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> $P(\%) = \frac{C_2}{C_1} \times \left( \frac{t_{IN} + t_{EX}}{t_{IN}} \right) \times 100$ <p>where</p> <p><math>C_1</math> is the challenge concentration</p> <p><math>C_2</math> is the measured mean concentration in the breathing zone of the test subject</p> <p><math>t_{IN}</math> is the total duration of inhalation</p> <p><math>t_{EX}</math> is the total duration of exhalation</p> <p>Measurement of <math>C_2</math> is preferably made using an integrating recorder.</p>  | <p>Pass</p> <p>These requirements have been complied with.</p> |
| 8.6     | Flammability  |  |
|         | <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.</p> <p>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 <math>(60 \pm 5)</math> mm/s.</p> <p>The head is arranged to pass over a propane burner the position of which can be adjusted. By means of a suitable gauge, the distance between the top of the burner, and the lowest part of the facepiece (when positioned directly over the burner) shall be set to <math>(20 \pm 2)</math> mm.</p> <p>A burner described in ISO 6941 has been found suitable.</p> |  |
| 8.7     | Carbon dioxide content of the inhalation air  | Pass   |
|         | <p>A total of 3 particle filtering half masks shall be tested: all 3 as received.</p> <p>The apparatus consists essentially of a breathing machine with solenoid valves controlled by the breathing machine, a connector, a CO2 flowmeter and a CO2 analyser.</p> <p>The apparatus subjects the particle filtering half mask to a respiration cycle by the breathing machine.</p> <p>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).</p> <p>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</p>  | <p>Pass</p> <p>These requirements have been complied with.</p> |

| Clause  | Requirement-Test  | Verdict and Result-Remark                           |
|---------|---|---|
|         | content of 5 % by volume.<br>A typical test arrangement is shown in Figure 7.   |   |
| 8.8     | Strength of attachment of exhalation valve housing  | Not applicable                                      |
|         | 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.<br>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.   | Not applicable                                      |
| 8.9     | Breathing Resistance  | Pass  |
| 8.9.1   | Test samples and fixture  | Pass  |
| 8.9.1.1 | ~Valveless particle filtering half masks™   | Pass  |
|         | A total of 9 ~valveless particle filtering™ half masks shall be tested:<br>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   | Pass<br>These requirements have been complied with. |
| 8.9.1.2 | ~Valved particle filtering half masks™  | Not applicable                                      |
|         | 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.<br>The particle filtering half mask shall be fitted securely in a leaktight manner but without deformation on the Sheffield dummy head.<br>The flow rate at which the resistance is measured shall be corrected to 23oC and 1 bar absolute.   | Not applicable                                      |
| 8.9.2   | Exhalation resistance   | Pass  |
|         | 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.<br>Measure the exhalation resistance with the dummy head successively placed in 5 defined positions:<br>- facing directly ahead<br>- facing vertically upwards<br>- facing vertically downwards<br>- lying on the left side<br>- lying on the right side | Pass<br>These requirements have been complied with. |
| 8.9.3   | Inhalation resistance   | Pass  |

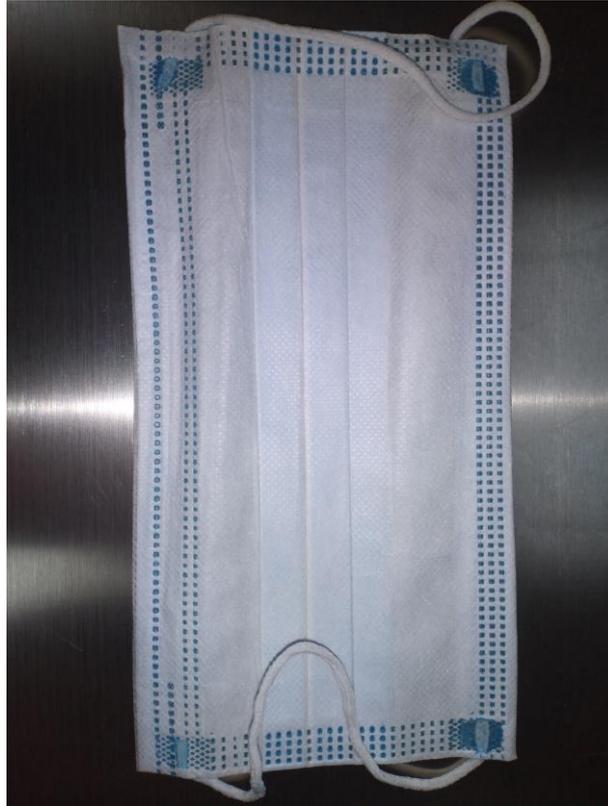
| Clause                               | Requirement-Test  | Verdict and Result-Remark                           |                   |                        |  |                                      |                             |                        |                   |               |  |               |  |     |     |   |      |   |    |   |      |   |    |   |    |   |    |   |    |   |   |   |    |  |  |    |    |   |   |    |    |  |  |    |    |    |   |    |   |   |
|--------------------------------------|---|---|-------------------|------------------------|--|--------------------------------------|-----------------------------|------------------------|-------------------|---------------|--|---------------|--|-----|-----|---|------|---|----|---|------|---|----|---|----|---|----|---|----|---|---|---|----|--|--|----|----|---|---|----|----|--|--|----|----|----|---|----|---|---|
|                                      | Test the inhalation resistance at 30 l/min and 95 l/min continuous flow.  | Pass<br>These requirements have been complied with. |                   |                        |  |                                      |                             |                        |                   |               |  |               |  |     |     |   |      |   |    |   |      |   |    |   |    |   |    |   |    |   |   |   |    |  |  |    |    |   |   |    |    |  |  |    |    |    |   |    |   |   |
| 8.10                                 | Clogging  | Pass  |                   |                        |  |                                      |                             |                        |                   |               |  |               |  |     |     |   |      |   |    |   |      |   |    |   |    |   |    |   |    |   |   |   |    |  |  |    |    |   |   |    |    |  |  |    |    |    |   |    |   |   |
| 8.10.1                               | Principle   | Pass  |                   |                        |  |                                      |                             |                        |                   |               |  |               |  |     |     |   |      |   |    |   |      |   |    |   |    |   |    |   |    |   |   |   |    |  |  |    |    |   |   |    |    |  |  |    |    |    |   |    |   |   |
|                                      | <p>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.</p> <p>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.</p>  | Pass<br>These requirements have been complied with. |                   |                        |  |                                      |                             |                        |                   |               |  |               |  |     |     |   |      |   |    |   |      |   |    |   |    |   |    |   |    |   |   |   |    |  |  |    |    |   |   |    |    |  |  |    |    |    |   |    |   |   |
| 8.10.2                               | Test equipment  | Pass  |                   |                        |  |                                      |                             |                        |                   |               |  |               |  |     |     |   |      |   |    |   |      |   |    |   |    |   |    |   |    |   |   |   |    |  |  |    |    |   |   |    |    |  |  |    |    |    |   |    |   |   |
|                                      | <p>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.</p> <p>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 <math>(37 \pm 2) ^\circ\text{C}</math> and 95 % R.H. minimum.</p>  | Pass<br>These requirements have been complied with. |                   |                        |  |                                      |                             |                        |                   |               |  |               |  |     |     |   |      |   |    |   |      |   |    |   |    |   |    |   |    |   |   |   |    |  |  |    |    |   |   |    |    |  |  |    |    |    |   |    |   |   |
| 8.10.3                               | Test conditions   | Pass  |                   |                        |  |                                      |                             |                        |                   |               |  |               |  |     |     |   |      |   |    |   |      |   |    |   |    |   |    |   |    |   |   |   |    |  |  |    |    |   |   |    |    |  |  |    |    |    |   |    |   |   |
|                                      | <p>Dust: DRB 4/15 dolomite</p> <p>The size distribution of dolomite dust is given in Table 3.</p> <p style="text-align: center;"><b>Table 3 — Size distribution of dolomite dust</b></p> <table border="1" data-bbox="336 1406 975 1861"> <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 | Pass<br>These requirements have been complied with. |
| 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                 |                        |  |                                      |                             |                        |                   |               |  |               |  |     |     |   |      |   |    |   |      |   |    |   |    |   |    |   |    |   |   |   |    |  |  |    |    |   |   |    |    |  |  |    |    |    |   |    |   |   |
| 8.10.4                               | Test procedure  | Pass  |                   |                        |  |                                      |                             |                        |                   |               |  |               |  |     |     |   |      |   |    |   |      |   |    |   |    |   |    |   |    |   |   |   |    |  |  |    |    |   |   |    |    |  |  |    |    |    |   |    |   |   |
|                                      | <p>Convey dust from the distributor to the dust chamber where it is dispersed into the air stream of 60 m<sup>3</sup>/h.</p> <p>Fit the sample particle filtering half mask in a</p>  | Pass<br>These requirements have been complied with. |                   |                        |  |                                      |                             |                        |                   |               |  |               |  |     |     |   |      |   |    |   |      |   |    |   |    |   |    |   |    |   |   |   |    |  |  |    |    |   |   |    |    |  |  |    |    |    |   |    |   |   |

| Clause | Requirement-Test   | Verdict and Result-Remark                           |
|--------|--|---|
|        | <p>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.</p> <p>Calculate the dust concentration from the weight of dust collected, the flow rate through the filter and the time of collection.</p> <p>Other suitable means may be used.</p>   |   |
| 8.10.5 | Assessment of clogging   | Pass  |
|        | 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.   | Pass<br>These requirements have been complied with. |
| 8.11   | Penetration of filter material   | Not applicable                                      |
|        | <p>The device shall be mounted in a leaktight 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.</p> <p>Testing of penetration, exposure and storage shall be done in accordance with EN 13274-7.</p>  | Not applicable                                      |
| 9      | Marking  | Pass  |
| 9.1    | Packaging  | Pass  |
|        | <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> <p>9.1.1 The name, trademark or other means of identification of the manufacturer or supplier.</p> <p>9.1.2 Type-identifying marking.</p> <p>9.1.3 Classification</p> <p>The appropriate class (FFP1, FFP2 or FFP3) followed by a single space and then:</p> <p>"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> <p>9.1.4 The number and year of publication of this European Standard.</p> <p>9.1.5 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</p> | Pass<br>These requirements have been complied with. |

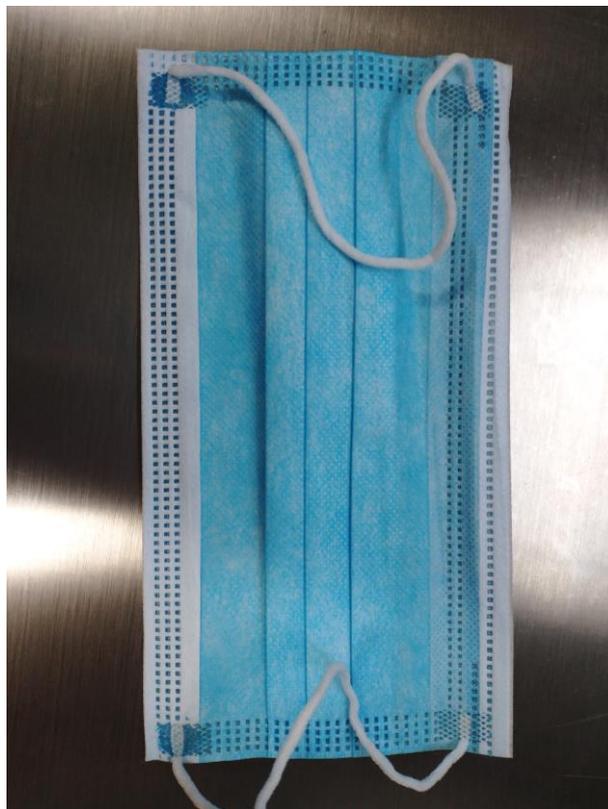
| Clause | Requirement-Test  | Verdict and Result-Remark                                      |
|--------|---|--|
|        | <p>the year and month.</p> <p>9.1.6 The sentence 'see information supplied by the manufacturer', at least in the official language(s) of the country of destination, or by using the pictogram as shown in Figure 12b.</p> <p>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.</p> <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.<br/>Example FFP2 R D</p>  |  |
| 9.2    | Particle filtering half mask  | Pass   |
|        | <p>Particle filtering half masks complying with this European Standard shall be clearly and durably marked with the following:</p> <p>9.2.1 The name, trademark or other means of identification of the manufacturer or supplier.</p> <p>9.2.2 Type-identifying marking.</p> <p>9.2.3 The number and year of publication of this European Standard.</p> <p>9.2.4 Classification<br/>The appropriate class (FFP1, FFP2 or FFP3) followed by a single space and then:<br/>"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.<br/>Example: FFP2 R D.</p> <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).<br/>Examples FFP3 NR D, FFP2 R D"</p> <p>9.2.6 Sub-assemblies and components with considerable bearing on safety shall be marked so that they can be identified.</p> | <p>Pass</p> <p>These requirements have been complied with.</p> |
| 10     | Information to be supplied by the manufacturer  | Pass   |
| 10.1   | Information supplied by the manufacturer shall accompany every smallest commercial available package.   | <p>Pass</p> <p>These requirements have been complied with.</p> |
| 10.2   | Information supplied by the manufacturer shall be at least in the official language(s) of the country of destination.   | <p>Pass</p> <p>These requirements have been complied with.</p> |

| Clause | Requirement-Test   | Verdict and Result-Remark                                   |
|--------|--|---|
| 10.3   | <p>The information supplied by the manufacturer shall contain all information necessary for trained and qualified persons on</p> <ul style="list-style-type: none"> <li>– application/limitations;</li> <li>– the meaning of any colour coding;</li> <li>– checks prior to use;</li> <li>– donning, fitting;</li> <li>– use;</li> <li>– maintenance (e.g. cleaning, disinfecting), if applicable;</li> <li>– storage;</li> <li>– the meaning of any symbols/pictograms used of the equipment.</li> </ul> | <p>Pass<br/>These requirements have been complied with.</p> |
| 10.4   | <p>The information shall be clear and comprehensible. If helpful, illustrations, part numbers, marking shall be added.</p>   | <p>Pass<br/>These requirements have been complied with.</p> |
| 10.5   | <p>Warning shall be given against problems likely to be encountered, for example:</p> <ul style="list-style-type: none"> <li>– fit of particle filtering half mask (check prior to use);</li> <li>– it is unlikely that the requirements for leakage will be achieved if facial hair passes under the face seal;</li> <li>– air quality (contaminants, oxygen deficiency);</li> <li>– use of equipment in explosive atmosphere.</li> </ul>   | <p>Pass<br/>These requirements have been complied with.</p> |
| 10.6   | <p>The information shall provide recommendations as to when the particle filtering half mask shall be discarded.</p>   | <p>Pass<br/>These requirements have been complied with.</p> |
| 10.7   | <p>For devices marked "NR", a warning shall be given that the particle filtering half mask shall not be used for more than one shift."</p>   | <p>Pass<br/>These requirements have been complied with.</p> |

### Testing photos



P1



P2