

## **MULTI-FUNCTION POWERED AIR PURIFYING RESPIRATORS (PAPR's)**

Centurion Safety Products is a U.K based manufacturer of Personal Protective Equipment, offering head, face, hearing and respiratory protection to wearers. It has been manufacturing this equipment for 124 years, and selling it's products Worldwide. It is pleased to be offered the opportunity to submit both verbal and written comments to the meeting which forms part of the research NIOSH is conducting to enable it to review and modify applicable standards for the above products.

Centurion Safety Products has a design philosophy that provides products against known and expected risks in the industrial work place. This philosophy provides the correct equipment for the correct hazard. Highly visible in the design process is consideration of the wearers' comfort and the wearers' acceptance of the equipment.

Centurion Safety Products has a testing philosophy that respiratory protection is so vital to the wearer that the effectiveness of the complete ensemble (hood, filter, seals, etc) should be tested together and thereby can provide more consistent respiratory protection than testing the various parts in isolation.

These two philosophies have enabled Centurion Safety Products to provide equipment worldwide that offers acceptable respiratory protection at an affordable price to the purchaser that does not alienate the wearer.

Centurion Safety believes that NIOSH has the power to issue "Temporary Licence Mandates" to recognise the acceptability of respiratory products approved by other respected/recognised approval bodies. The benefit of this would be to enable the specifier and wearer quicker and easier access to a wider more acceptable, comfortable and user friendly range of respiratory products. However, Centurion Safety believe that NIOSH has not at this time been presented with a sufficiently persuasive argument to utilise these powers. Centurion believe that there are now pressing market needs that warrant the issue of relevant temporary licence mandates for certain respiratory products. With the completion of the revision and republication of 42 CFR Part 84 these temporary licence mandates could be withdrawn if the products did not comply with the revised legislation.

In mind of the above-proposed radical approach Centurion Safety would like to submit that the following points be taken into consideration when revising the testing and in use performance requirements: -

1. That the revision of 42 CFR Part 84 should not seek to provide aspirational performance requirements that will take years to deliver. It therefore submits that the revisions should be such that they allow authorisation and approval of equipment, which exists now and would provide real benefits to wearers now.

2. That because no one respiratory protection device offers the luxury of being capable of protecting against all risks that the standards are modified to allow devices to be approved against specific risks. (If such all encompassing devices were technically feasible they would be extremely cumbersome and unacceptably interfere with the wearer whilst they tried to carry out their duties. This is certainly true for industrial workers who are required to wear respiratory equipment for considerable periods of time.)

3. That negative pressure devices, PAPR's and SCBA devices should be approved to different performance requirements in different sections of the CFR.

4. That there are currently no recognised standards for such things as communications or wearability. Therefore NIOSH should not allow the development of these to slow down the revision of the respiratory requirements of 42 CFR, and rather than delay publication of revised respiratory performance requirements that these are revised soonest to allow acceptable respiratory product into the market.

5. That NIOSH should restrict its performance requirements to those of respiratory protection. There are already in existence well-respected performance standards, both North American based and elsewhere in the World for vision, hearing and head protection. These should be cited in applicable Regulations and policies rather than NIOSHs own requirements being written.

6. That NIOSH should constrain itself to areas where there are currently no respiratory standards or unacceptable standards exist.

7. That NIOSH accept 3<sup>rd</sup> party approvals (e.g. ANSI, EN) etc for eye, head and hearing protection to enable good PAPRs to be approved.

8. That NIOSH consider 3<sup>rd</sup> party approvals for respiratory protection where products can be proven to meet an efficiency standard for the protection needed for a particular application.

9. That NIOSH consider classifying PAPRs by the level of protection offered, considering their suitability for purpose.

10. That NIOSH considers implementing a mechanism whereby 42 CFR Part 84 is regularly updated. Updating of the rules and or test methods to keep abreast of technology would enable inclusion of better and modern technology as and when it is developed.

11. That NIOSH, facilitates the introduction of revised standards by, utilising test methods for determining performance efficiency that are proven and recognised in published standards originating from 3<sup>rd</sup> parties (e.g. EN, etc.)

12. That rather than testing the discrete components e.g. filter, face seal etc. 42 CFR Part 84 could greatly benefit if performance requirements were based on complete equipment testing. This could involve utilising panels of "real" people with a non-toxic test aerosol.

Notwithstanding the above Centurion Safety Products submits comments to be incorporated into the revision of 42 CFR Part 84 1995 with respect to powered particulate filtering respirators only.

The attached proposed changes to 42 CFR Part 84 which if adopted with reasonable speed would enable a more comprehensive and effective range of acceptable respiratory devices to be available for selection by the appropriate specifiers and users.

Centurion Safety Products has proposals to make only on the following clauses;-

Subpart KK 84.1100d Scope,  
Subpart KK 84.1142 Isoamyl tightness test,  
Subpart KK 84.1151 DOP filter test,  
Subpart KK 84.1152 Silica dust loading test.

Centurion has the following specific comments to make about the revision of 42 CFR Part 84: -

Item	Clause	Comments	Proposal	Justification
1	Subpart KK Scope	Centurion Safety believes that powered respirators should not be restricted to only high efficiency (HEPA) as per 84.130(a)(4)	We suggest that powered respirators should be categorised into 3 levels based on the filter categorisation. (See 84.1151 below)	This specific category 84.130(a)(4) is targeted at low levels of highly toxic substances (below 0.05mg/m3). In modern industry contaminants are generally less toxic, but respiratory equipment can offer protection from much less toxic contaminants over a long time period. By forcing manufacturers to design to this requirement is imposing excessive design constraints and additional burdens on the user. This is likely to manifest itself in bigger more expensive, more resistive filters that clog quicker, as well as larger, heavier batteries to power more substantial motors. Hence reinforcing the commonly held view that respirators are cumbersome and uncomfortable.
2	84.1142 Isoamyl tightness test.	Centurion Safety believes that this test is impractical for certain types of product and that it is not specific enough in determining the suitability of the product.	We suggest that this test be replaced with a quantitative test using the filters that are intended for use with the power unit. This test might for example be similar to the Total Inward Leakage Tests employed in EN146 or EN12941/2 with limits based on the filter classification as per 84.1151 (i.e. 95%, 99% and 99.97%)	The requirement for the respirator to accept a similar size, similar resistance carbon filter for this test restricts the design of the unit and hampers the designer in producing filters of small size and low resistance. In particular designers using novel shaped low resistance filters will not be able to provide an equivalent carbon filter. The test is also subjective, depending on the test subject and does not give a quantitative indication of the performance of the system. We would recommend this test be replaced.
3	84.1151 DOP filter test	Centurion Safety believes that powered respirators should not be restricted to only high efficiency (HEPA) as per 84.130(a)(4). Additionally since the majority of applications are never likely to involve oil mists consideration should be given to the test aerosols used.	We suggest that the filter classifications and test methods used for negative pressure filters N,R & P 95, 99 & 100 (clause 84.179) are adopted for powered respirator filters with appropriately adjusted flow-rates.	See Item 1 above. The justification for different classifications for filters has already been accepted for negative pressure filters, we would argue that there is no justification not to extend this to powered respirator filters.

Item	Clause	Comments	Proposal	Justification
4	84.1152 Silica dust loading test. ( and other clauses detailing flow rates )	Centurion Safety believes there should be more flexibility in allowing manufacturers to determine the minimum design flow rate of the powered respirator.	We suggest that either the minimum flow rate requirements for a loose fitting hood is dropped completely or reduced to 120 l/min. The total inward leakage test as described in Item 2 above would be conducted at the manufacturers declared minimum design flow rate thus demonstrating that the airflow is sufficient and the product effective.	The requirement of a minimum airflow of 170 l/min for loose fitting hoods can result in several negative effects on the user. The additional airflow results in more expensive filter medium and has consequential effects on the motor and power requirements. This results in a heavier and more expensive piece of equipment. The additional power needed requires larger heavier batteries and the extra airflow can cause both irritation and physical damage and to the user. In a well designed powered hood/helmet system 170 l/min is not necessary and the effectiveness of the equipment can be demonstrated by conducting a Total Inward Leakage type test as described in Item 2 above.

**Other Comments**

- 5 Table 12  
Table 12 references a Pressure Tightness Test. This test is not mentioned anywhere in the text.