PERFORMANCE TEST RESULTS AGAINST DEPARTMENT OF TRADE, INDUSTRY AND COMPETITION RECCOMMENDED GUIDELINES FOR:

FABRIC FACE MASK WITH FILTER

VERSION 24th APRIL 2020

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PRODUCT DESCRIPTION

IPU D15

Reusable Polyester Face Mask

CUSTOMER Sapphire Corporate Solutions (Pty) Ltd

DATE 15th June 2020

FABRIC FACE MASK AND FILTERS TEST INFORMATION

The recommended guidelines from the DTIC have been incorporated and interpreted to form the basis of the test requirements. Wherever possible, the vague statements of requirements in the guidelines, have been converted to minimum requirements to enable face masks or filters to be tested against recognised standards.

The guidelines have not specified a definite requirement in terms of a number of mask characteristics and as a result, various technical experts in the textile industry were consulted to obtain reasonable values that could be used as an interpretation of the DTIC requirements. Unless there is a minimum standard, it is difficult to develop a compliance standard for face masks and filters.

Permeability – Section 3 (d) refers to ease of breathing. The mask with a filter must not restrict breathing. In order to measure ease of breathing an airflow reading is required. Using the average area of a mask at 0,02m² and an average of 8 litres of air breathed by an adult per minute, it would be fair to assume that the mask test result should be a permeability of at least 75% of this at 125Pa. The assumption is that there will be at least 15 -25% leakage in most textile masks. A minimum permeability level of 300 liter/second/m² (60cfm) is therefore reasonable to assume. This test report only examines the influence of the filter, hence the airflow specification being adjusted upwards to a minimum of 700cfm.

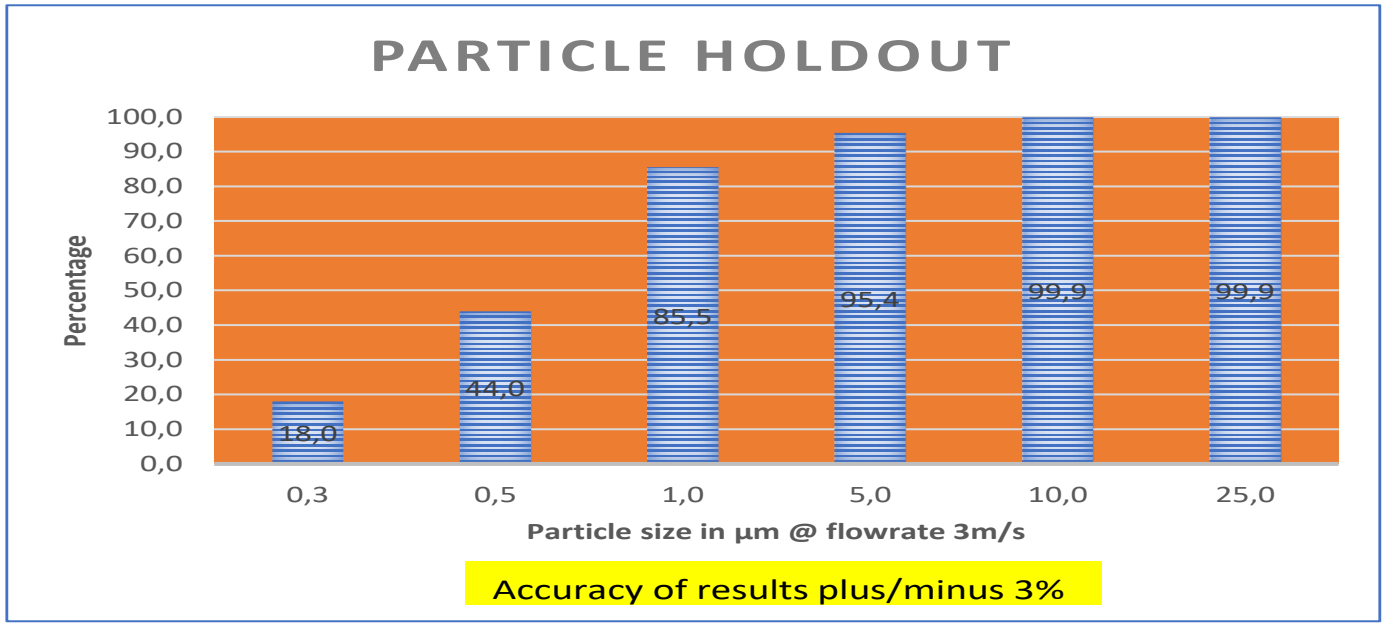
Breathability or Moisture vapour transmission rate – Section 3 (e) refers to comfort while wearing. Mask breathability and heat load on the face can be measured by recording the moisture vapour transmission rate. Most laminated or coated breathable rainwear products for workwear applications need a minimum of 3000g/m²/24hrs. As this is not a workwear or military item, it is believed that a value of 2500 g/m²/24hrs would be sufficient to maintain a manageable heat load on the face.

Particle Holdout – Section 3 (b and c) and Section 4.1.2 (a and b) and Section 4.1.4 (i) refer to a minimum requirement of 75% holdout of 5µm and upwards respiratory particle size. Section 3c refers to the higher the holdout capability of the filter and the mask, the better. Testing is done against the 5µm requirement, but there is also a graph that show filter holdout efficiency against 0,3µm particle size up to 25µm particle size. Test result accuracy on the modified ISO 14644 method is plus/minus 3%.

Disclaimer

These test results are only applicable to filters for Public Masks as indicated by the DTIC guidelines. Any masks or filters tested under this specification are not qualified to be used in or for Medical Masks. Medical mask requirements are aligned to FFP2 and FFP3 or N95 standards. The test facilities used for the particle holdout results are a modified ISO 14644 method. This method is not suitable for the evaluation of medical masks. Medical PPE have much higher performance requirements that what can be achieved by public mask test facilities and need to be evaluated against SANS 1866.

Test Characteristic	Method	Measurement	Requirement	Results	Pass/Fail
Number of Layers (Range)	Visual	Visual	2 or 3	3	Pass
Mask Air Permeability (Minimum)	ASTM D737	cfm @ 125Pa	60	196	Pass
Breathability (Minimum)	SANS 6163	Grms/m²/24hrs	2500	5876	Pass
Inner Layer Spray rating surface wetting	ISO 4920	Rating 1 - 5	< 3	2	Pass
Filter Airflow Restriction (Maximum)	ASTM D737	cfm @ 125Pa	<25%	12%	Pass
Mask Particle Holdout (Minimum)	Mod ISO 14644-1	Particle Holdout percentage 5,0µm	75%	95,4%	Pass



NOTES

The Sapphire Corporate Solutions IPU D15 Reusable Polyester Face mask complies with the performance requirements as stated in the DTIC Fabric Facemask Guidelines as published on 24th April 2020.

SIGNED