



Test Report

No.: T32020240434SN

Date: MAY 18, 2020

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ZHANGPU TONGBAO INDUSTRY & TRADE CO., LTD
MANAGEMENT AREA OF FIELD DEPARTMENT, DANANBAN TOWN, ZHANGPU COUNTY,
ZHANGZHOU CITY, FUJIAN PROVINCE, CHINA

The following samples were submitted and identified on behalf of the client as:

DISPOSABLE PROTECTIVE MASK

SGS Case No. : CA320202422819
 Style / Item No. : TB-01
 Ref. No. : CP20-014856
 Lot No. / Batch Code : NOT PROVIDED
 Sample Description : BLUE MASK
 Quantity Submitted : 100 PCS.
 Manufacturer : ZHANGPU TONGBAO INDUSTRY & TRADE CO., LTD
 Country of Origin : CHINA
 Country of Destination : UNITED STATES
 Sample Receiving Date : APR 20, 2020
 Test Performing Date : APR 20 TO MAY 18, 2020

Test Requested : Please refer to the result summary.

Test Method & Results : Please refer to next page(s).

Result Summary :

| Test Requested | Result Summary |
|--|----------------|
| ASTM F2100-19 Standard Specification for Performance of Materials Used in Medical Face Masks | See Result |

Signed for and on behalf of
SGS Hong Kong Ltd.

Au Kam Chi, Gigi
Technical Manager

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ASTM F2100-19 Standard Specification for Performance of Materials Used in Medical Face Masks

Scope : This specification covers testing and requirements for materials used in the construction of medical face masks that are used in providing healthcare services such as surgery and patient care. This specification provides for the classification of medical face mask material performance.

Number of Specimen : 100 pcs of complete product

| <u>Clause</u> | <u>Test Items/requirement</u> | <u>Test Result Summary</u> |
|---------------|--|---|
| 5 | <u>Classification</u> | See Table 1 |
| 6 | <u>Requirements</u> | |
| 6.1 | The properties of the medical face mask material shall conform to the specifications requirements in Table 1, as tested in accordance with Section 9. Bacterial filtration efficiency (ASTM F2101) Differential pressure (EN 14683:2019 Annex C) Sub-Micron Particulate Filtration (ASTM F2299) | > 98% < 6.0 mm H ₂ O/cm ² > 98% |
| 6.2 | Resistance to penetration by synthetic blood (ASTM F1862) Flammability 16 CFR Part 1610 | Penetration not seen at 120 mm Hg Class 1 |

Table 1 Medical Face Mask Material Requirements by Performance Level

| Characteristics | Level 1 Barrier | Level 2 Barrier | Level 3 Barrier |
|--|-----------------|-----------------|-----------------|
| Bacterial filtration efficiency, % | ≥ 95 | ≥ 98 | ≥ 98 |
| Differential pressure, mm H ₂ O/cm ² | < 5.0 | < 6.0 | < 6.0 |
| Sub-micron particulate filtration efficiency at 0.1 micron, % | ≥ 95 | ≥ 98 | ≥ 98 |
| Resistance to penetration by synthetic blood, minimum pressure in mm Hg for pass result# | 80 | 120 | 160 |
| Flame spread | Class 1 | Class 1 | Class 1 |

- An acceptable quality limit of 4,0 % is met for a single sampling plan when 29 or more of the 32 tested specimens show "pass" results.

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Result 1 Bacterial filtration efficiency ASTM F2101-19

Test Side : White Side
 Pre-Conditioning : Minimum of 4 hours at 21±5°C and 85±5% R.H.
 Dimensions of test specimen : ~ 170 mm x 160 mm
 BFE Test Area : 40 cm²
 BFE Flow Rate : 28.3 l/min
 Test bacteria : Staphylococcus aureus ATCC 6538
 Mean Particle Size : 2.8 µm
 Positive Control Average : 2.9 x 10³ CFU
 Negative Monitor Count : < 1 CFU

| Test Specimen | Percent BFE (%) |
|---------------|-----------------|
| 1 | 99.9 |
| 2 | 99.8 |
| 3 | 99.8 |
| 4 | 99.8 |
| 5 | 99.8 |

Result 2 Differential pressure EN14683:2019+AC:2019 Appendix C

Test Side : White Side
 Pre-Conditioning : Minimum of 4 hours at 21±5°C and 85±5% R.H.
 Dimensions of test specimen : ~ 170 mm x 160 mm
 Flow Rate : 8 l/min

| Test Specimen | ΔP (mm H ₂ O/cm ²) | ΔP (Pa/cm ²) |
|---------------|---|--------------------------|
| 1 | 4.0 | 39.4 |
| 2 | 4.3 | 42.5 |
| 3 | 4.1 | 40.3 |
| 4 | 4.3 | 41.9 |
| 5 | 4.2 | 41.6 |

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Result 3 Sub-Micron Particulate Filtration ASTM F2299/F2299M-03 (Reapproved 2017)

Test Side : Blue Side
 Pre-Conditioning : Minimum of 4 hours at 21±3°C and 30-50±5% R.H.
 Test Condition : 23 °C and 23% R.H.
 Test Area : 91.5 cm²
 Particle Size : 0.1 µm
 Average Filtration Efficiency : 98.72%
 Standard Deviation : 0.69

| Test Specimen | Test Article Counts | Average Control Counts | Filtration Efficiency (%) |
|---------------|---------------------|------------------------|---------------------------|
| 1 | 92 | 12,309 | 99.25 |
| 2 | 208 | 12,144 | 98.3 |
| 3 | 280 | 11,953 | 97.7 |
| 4 | 92 | 11,798 | 99.22 |
| 5 | 101 | 11,776 | 99.14 |

Result 4 Resistance to penetration by synthetic blood ASTM F1862/F1862M-17

Test Side : Blue Color (Outside)
 Pre-Conditioning : Minimum of 4 hours at 21±5°C and 85±5% R.H.
 Test Condition : 20.5 °C and 22% R.H.
 Test Pressure : 120 mmHg
 No of Test Specimen Tested : 32
 No of Test Specimen Passed : 32

| Test Specimen # | Synthetic Blood Penetration |
|-----------------|-----------------------------|
| 1-32 | None Seen |

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Result 5 Flammability Test of Clothing Textiles (16 CFR Part 1610 - October 20, 2008 Edition)

Sample : Fabric cut from submitted sample
Fabric Surface : Plain (Face)
Test Specimen Direction : Length

| As Received | | |
|-------------------------------------|----------------------------|------------------|
| | <u>Flame Spread (sec.)</u> | <u>Burn Code</u> |
| (1) | -- | IBE |
| (2) | -- | IBE |
| (3) | -- | IBE |
| (4) | -- | IBE |
| (5) | -- | IBE |
| Flammability Classification: | | Class 1 |
| Requirement: | | Class 1 |

Remarks:

- Class 1 – Normal Flammability**
 Class 1 textiles exhibit normal flammability and are acceptable for use in clothing.
 Test Criteria for plain surface textile fabric:
 - There are no burn times; or
 - There is only one burn time and it is equal to or greater than 3.5 seconds; or
 - The average burn time of two or more specimens is equal to or greater than 3.5 seconds.
- Disposable fabrics and garments shall not apply to be refurbished before testing.

Burn Code Description:

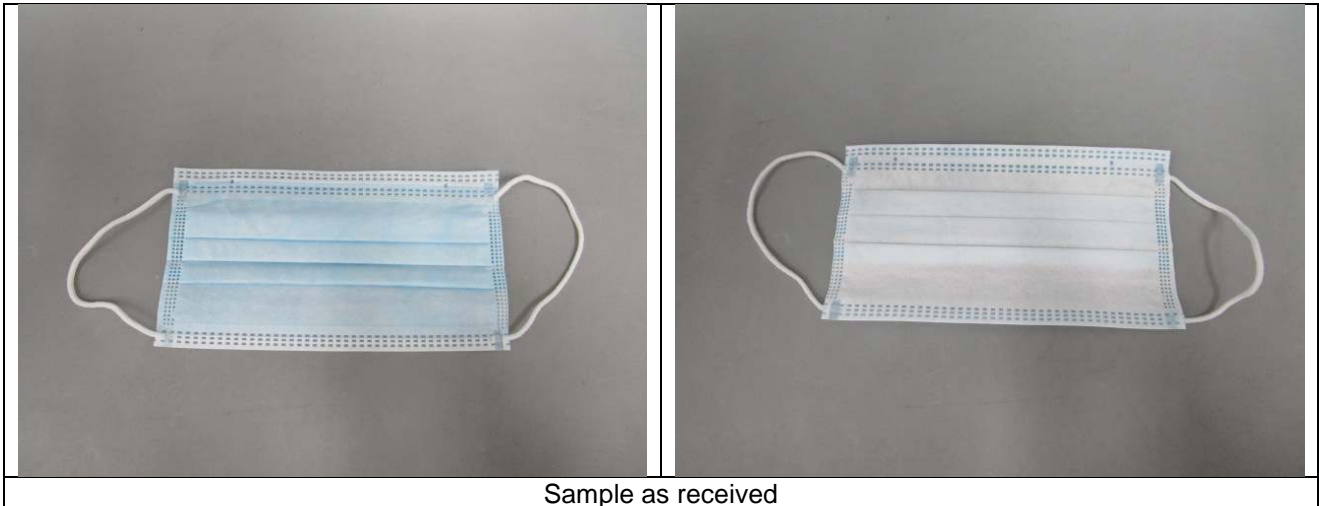
IBE = Ignited, but extinguished

Note : All the test results except Flammability test contained in this Test Report was conducted by a SGS assessed competent subcontractor laboratory

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Photo Appendix



Sample as received

*** End of Report ***

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