



# Description of industry standard for silicone rubber coated fiberglass fabric

## 1 Summary

Silicone rubber coated fiberglass cloth, which the glass fiber cloth as the substrate, coated silicone rubber glass fiber fabric, with single side coating and double sides coating, the coating process is impregnating, rolling, scraping and so on. Silicone rubber coated glass fiber cloth with high tensile strength, stable size, excellent electrical insulation properties and chemical resistance and weather resistance, meanwhile, silicone rubber can improve the folding performance and wear resistance of glass fiber. Silicone rubber coated fiberglass fabric can be widely used in the following areas: ① Electrical insulation: Silicone rubber coated fiberglass membrane structure material, with high electrical insulation level, can withstand high voltage, it can be made of insulating cloth, sleeving and other products. ② Fabric expansion joint: fabric expansion joint as a flexible connecting devices of pipeline, which can solve the thermal expansion and contraction of the pipeline. Silicone rubber coated fiberglass membrane structure material as a flexible expansion joint of the substrate, has a high temperature, corrosion resistance and anti-aging properties, flexibility and excellent flexibility, and it's widely used in petroleum, chemical, cement, Steel, energy and other fields. ③ Anti-corrosion: silicone rubber coated fiberglass fabric, can be used as inside and outside the anti-corrosion layer of pipes, tanks, with excellent corrosion resistance, high temperature, high strength, and it's ideal anti-corrosion material. ④ Other fields: silicone rubber coated fiberglass membrane structure materials can be applied to building membrane, sealing materials, high temperature corrosion conveyor belt, packaging materials and other fields.

## 2 The principles and basis for standard setting

### 2.1 Standards

- (1) ASTM D 1458-01 "Test method for fully cured silicone rubber coated glass fiber cloth and glass fiber tape for electrical insulation"
- (2) ASTM D 1459-93 (2003) "Silicone coated fiberglass cloth and fiberglass tapes for electrical insulation"
- (3) ASTM D 1931-99 "Completely vulcanized silicone coated fiberglass cloth and fiberglass tapes for electrical insulation"
- (4) GB/T 532-1997 "Vulcanized rubber or thermoplastic rubber and fabric adhesive strength determination"
- (5) GB/T 2679.5-1995 "Determination of the folding endurance of paper and paperboard"





(MIT folding method)"

- (6) GB/T 19089-2003 "Determination of abrasion resistance of rubber or plastics coated fabrics by Martindale method"
- (7) GJB 983.3-90 "Military rubber film test method of air tightness test and pressure test"
- (8) HG / T 305-1989 (1997) "Determination of adhesive strength of coating on rubber or plastic coated fabrics"

## 2.2 The principles and basis for standard setting

As wide application of silicone rubber cloth more, if listed according to different requirements will make the standard more lengthy, is not conducive to use. Therefore, this standard provides a number of basic technical indicators, if the users have special requirements, they can ask from the manufacturer.

## 3 The description of standard technical content.

### 3.1 Product classification

As the silicone rubber coated fiberglass cloth production process updated constantly, the usage is expanding, in order to avoid restrictions on the new process and the new usages, the coating products are divided into single-side coating and double-side coating, and it is divided into two types of ordinary type and flame retardant type according to the combustion performance.

### 3.2 Thickness

There are many factors influencing the thickness of glass fiber products, there are two current standards to measure the thickness, one is GB7689.1-2001, the diameter of presser foot is 56.43mm, the pressure weight is 5000cN, the test time is 30s. The other is JC / T170-2002 Appendix A, the provisions of the presser foot diameter is 16mm, pressure weight of 2kg, test time is 2~3s, we will make comparison experiment of two kinds of single side-coated silicone rubber cloth, 1.385mm /1.434mm and 1.265mm/1.331mm, there is large difference between them. Taking the users' using habitat into consideration, we use the JC / T 170-2002 Appendix A test method, This method is consistent with JC / T176 "Test Method for Glass Fiber Products"

### 3.3 Mass per unit area

Silicone glass fiber cloth is widely used, and there are varieties kinds of fiberglass fabric and silicone rubber, there is also a great difference in the amount of coating, different requirements of coating amount for different application. Due to the benefit of buyer and supplier, the provisions of this part of the unit area





measured value of the mass is not less than the nominal value proposed by the supplier.

### 3. 4 Tensile breaking strength

There are many specifications for the standard of silicone rubber coated glass fiber cloth, the thickness is 0.30 to 1.79mm, while there new specifications will be in the future, so it is impossible to specify specific strength indicators to each specification. Therefore, this standard is to determine the thickness of the classification method to determine the strength:

- (1) According to the enterprise standards, the theoretical calculation is base on the thickness, mass of the unit area, yarn number and density of the base fabric.
- (2) With reference to the relevant requirements of international enterprise standards, make appropriate adjustments of the indicators.
- (3) Test the typical specifications.

Table 1 Tensile breaking strength of silicone rubber fabric from international enterprises.

| Specification/mm       | Standar d | CSHyde Company | TACONIC       | BISCOR  |
|------------------------|-----------|----------------|---------------|---------|
| 0.30 One side coated   | 850       |                |               | 350/313 |
| 0.356 Two sides coated | 800       | 112            |               |         |
| 0.381 Two sides coated | 800       |                | 1647/120<br>2 |         |
| 0.44 One side coated   | 1100      |                |               | 500/375 |
| 0.457 One side coated  | 1100      | 2336           |               |         |
| 0.49 Two sides coated  |           |                |               | 450/338 |
| 0.508 One side coated  | 1300      | 2336           |               |         |
| 0.559 Two sides coated | 1200      |                | 1602/138<br>0 |         |
| 0.584 One side coated  | 1300      |                | 1602/138<br>0 |         |
| 0.584 Two sides coated | 1200      | 2336           |               |         |
| 0.635 Two sides coated | 1400      | 2336           |               |         |
| 0.762 Two sides coated | 1600      |                | 1602/138<br>0 |         |
| 0.93 Two sides coated  | 2000      |                |               | 875/800 |
| 1.016 Two sides coated | 2200      | 4672           | 2003/155<br>8 |         |
| 1.067 One side coated  | 2300      | 4672           |               |         |
| 1.524 One side coated  | 3300      | 7007           |               |         |





### 3.5 Combustion performance

Some users use this product in the field of fire retardant, material combustion performance is divided into A-level, B1, B2, B3 level of GB8624, this standard based on user requirements and production to determine the technical requirements of the product is B1 (Textiles), and there are four indicators: continued burning time, smoldering time, damage length, oxygen index.

### 3.6 Tear strength

Tear strength is a technical index that reflects the shear resistance of products, and it's an important mechanical property.

### 3.7 Folding performance

The fabric expansion joints will reciprocate during operation, the silicone rubber coated glass fiber cloth of the fabric expansion joint will be folded, there will be media leakage since the sealing materials breaks. This standard tests the folding performance of silicone rubber coated glass fiber cloth that used for sealing layers, it's also to verify the reliability of the material.

### 3.8 Temperature performance

There will be high temperature media and low temperature media during the operation of silicone rubber cloth, thus, high temperature and low temperature stability are very important properties. This standard takes the observation of high temperature and low temperature of the appearance changes to judge the temperature performance. Some manufacturers impose the low price silicone rubber to good silicone rubber, and damage the benefit of users, thus, the provisions of the temperature performance will affect the fact.

### 3.9 Sealing performance

Sealing performance take the standard of GJB983.3-90, the standard does not make the provisions of the test fixture, and the sampling method is for rubber film. While This standard specifies test fixtures and sampling methods.

### 3.10 Adhesion strength

Because of the low strength of the silicone rubber, the coating is not easy to be stripped from the fabric, this standard specifies the alternative methods used in clause 1 to compare by the users.

### 3.11 Sulfurous acid resistance

The technical indicators mainly for the occasion of acid corrosion silicone rubber





cloth, by comparing the changes of mass, strength, sealing performance before and after the acid treatment. The strength test is a destructive test, the sample can not be the same before and after the acid treatment, to ensure the comparability of the results, the yarn of samples are the same.

### 3.12 Combustible Content

There are many users want to add the index of combustible content, but there are much residue of the silicone rubber itself after the high temperature treatment, so it can not truly reflect the amount of silicone rubber coating, and some substances in the residue can improve the performance of silicone rubber, and some reduce the performance of silicone rubber, so the combustible content does not reflect the performance of the product. Many of the performance of this standard, such as folding performance, acid resistance and sealing performance will be affected by the coating amount. As an industry standard, the final performance of the product as a basis for judging is proper, and the amount of coating as a corporate internal control index is more appropriate.

