

Insulation Components of Oil-immersed Transformer

Main Property Standard Value

Insulating components are made of 100% Electrical-grade pulp through special designed moulds and processing methods or professional machines, which can ensure application in oil-immersed power transformers for good mechanical strength and insulation property.

Both of electrical and mechanical properties of insulating components depend on raw materials quality and manufacturing methods. Different manufacturing methods will result in different performance on final products. According to the diversities of producing methods and techniques, insulation components can be classified into three main categories: (1) special-shape parts molded by hands, (2) Molded components by pressing and framing on machinery, (3) mechanical kits/components. Special-shape parts are more complicated on shape-designs, such as Lead exits; Components pressed & moulded by machinery, like clamps, angle rings, are made by molds without adding any adhesive and additive; Mechanical kits/components are made through processing of laminated boards into different parts.

The quality of insulation components should be conformed with the following standards:

1、 Requirements on appearance

The dimension should be in conformity with design drawings;

The inside and outside surfaces of moulded parts should be flat and free of delamination, cracks, ruptures, convex-concave, polluted spots, bubbles and holes. and its transverse section should be smooth and free of burrs and carbonization.

The surface of Mechanical kits/components must be smooth and free of defects like convex-concave, bubbles, polluted spots, etc; and the glue or adhesive must be even and free of bursting, bubble, degumming and delaminations. All processed sections must be smooth, no convex-concave and cracks more than 0.2mm, no carbonization, no color difference due to density and processing.

Color of components should be natural as raw material, but part of shades deviation caused by repairing under 30square millimeter per area are allowed. Burling depth is not exceeding 30% of the thickness. No burling marks on components with thickness less than 2 mm.

2、 Requirements on machining property

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The components should be durable to mechanical process, such as shearing, drilling and milling . They should be free of cracks, ruptures and carbonizing discolor caused by processing.

3、 Requirements on binding/adhesive agent

During the production process, the binding/adhesive agent required must perform very well in adhesiveness, thermal resistance, aging resistance and compatibility with transformer oil meanwhile be free of pollution to transformer oil.

4、 Physics and chemistry property of components should conform to the standard as follow:

| 序号 No | 项目名称 Property | | 单位 Unit | 指标值 Value | | | 试验方法 Means of Test |
|----------|--|------------------------|-------------------|--------------------------|---------------------------|------------------------|------------------------|
| | | | | 异型件 Hand-molded parts | 模压件 Press-Molded parts | 结构件 Structure parts | |
| 1 | 紧度 Apparent density | | g/cm ³ | 0.70-1.00 | 1.00-1.25 | 1.10-1.35 | GB/T451.2 GB/T451.3 |
| 2 | 水分 Moisture content | | % | <6.0 | | ≤4.0 | GB/T462 |
| 3 | 灰分 Ash content | | % | <1.0 | | ≤0.6 | GB/T463 |
| 4 | 水抽出物电导率 Conductivity of aqueous extract | | ms/m | <8.0 | | | GB/T7976 |
| 5 | 水抽出物PH值 PH of aqueous extract | | - | 5.5-9.0 | | | GB/T1545.2 |
| 6 | 收缩率 Shrinkage | 厚度方向 Thickness | % | <5.0 | | ≤4.0 | GB/T451.2 GB/T452.1 |
| | | 其他方向 Otherwise | % | <1.0 | | ≤1.0 | |
| 7 | 电气强度 Electrical strength | 1-2mm | 空气中 In air | >8.0 | | | GB/T1408 IEC763-2 |
| | | | 油中 In oil | | | | |
| | | 2mm 以上 | 空气中 In air | >8.0 | | | |
| | | | 油中 In oil | >20 | | | |
| 8 | 吸油率 Oil absorption | | % | ≥9 | | IEC763-2 | |
| 9 | 弯曲强度 Flexural strength | 垂直层向 Vertical Sheet | 纵向 MD | N/mm ² | | ≥100 | IEC763-2 |
| | | | 横向 CMD | | | | |