## 4. Aperçu des propriétés détaillées

### 4.1. Hapa-phénol : papier bakélisé laminé utilisable jusqu'à 120°C

**Propriétés**

| *Test Method* | *Norm* | | *Sheets* | *Sheets* | *Tubes and rods* |
|---|---|---|---|---|---|
| | *(D) DIN 7735* | | *Hp 2061* | *Hp 2061.5* | *HP 2065* |
| | *EN 60893/IEC 893* | | *PF CP 201* | *PF CP 202* | *PF CP 21* |
| | *(GB) BS* | | *5102-3* | *5102-1* | |
| | *(USA) NEMA L1* | | *X.XP* | *XX* | |
| | *(F) NF C26* | | *150-PO* | *150-Pa* | |
| | *(CH) VSM* | | *S-PF-CP 1* | *S-PF-CP2* | |
| | *Resin* | | *phenol* | *phenol* | *phenol* |
| | *Reinforcement* | | *paper* | *paper* | *paper* |
| Denisity | DIN 53479 | g/cm$^3$ | 1,3-1,4 | 1,3-1,4 | 1,0-1,1 |
| Flexural strength, unproces. / 23°C | DIN 53453 | MPa | 150 | 130 | 100 |
| Impact strength a $_{n10}$ end a $_{n15}$ | DIN 53453 | kJ/m$^2$ | 20 | 20 | - |
| Notched bar impact value a $_{k10}$ | DIN 53453 | kJ/m$^2$ | 5 | 4 | - |
| Notched bar impact value a $_{k15}$ | DIN 53453 | kJ/m$^2$ | 15 | 15 | - |
| Tensile strength | DIN 53455 | MPa | 120 | 100 | 50 |
| Compressive strength | DIN 53454 | MPa | 150 | 150 | 40 |
| Split load | DIN 53463 | N | 2000 | 2000 | - |
| Modulus of elasticity-bending test | DIN 53457 | MPa | 7000 | 7000 | 6000 |
| Resistance between plugs after 24 h storage in water/23°C | DIN 53482 | Ω | - | - | $10^8$ |
| 1 minute test voltage parallel to lamination | DIN 53481 | kV | 15 | 40 | 25 |
| 1 minute test voltage perpendicular to lamination | DIN 53481 | kV | 15 | 40 | 25 |
| Dielectric loss factor | | | | | |
| 50 Hz / 96h / 105 °C | DIN 53483 | max. | - | 0,05 | - |
| 1 MHz / 24h storage in water | DIN 53483 | max. | - | - | - |
| Dielectric constant $e_r$ | DIN 53483 | >> | 5 | 5 | - |
| Tracking resistance index | IEC 112 | CTI | 100 | 100 | 100 |
| Electrolytic corrosion | DIN 53489 | max. | - | - | - |
| Arc resistance | DIN 53484 | class. | - | - | - |
| Thermal conductivity | DIN 52612 | W/m*k | 0,2 | 0,2 | - |
| Linear expansion coefficient | VDE 0304/2 | $10^{-6}$/K | 20-40 | 20-40 | - |
| Temperature index | VDE 0304/2 | °C | 120 | 120 | 120 |
| Flammability | UL 94 | class | - | - | - |
| Oxygen index | ISO 4589 | % | - | - | - |
| Insulating class | IEC Publ.85 | | E | E | - |
| Glow rod test | DIN 53459 | class | 2b | 2b | - |
| Water absorbtion, 4 mm thick. | DIN 53459 | mg | 600 | 300 | - |
| Colour | | | brown | brown | brown |