ELANTAS
Electrical Insulation

**Product Information**

Electronic Protection System

**Thick Film Coating, UV Cure**

# Bectron® PT 4606

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## Product description

Bectron® PT 4606 is solvent free, one-component, polyurethane based and transparent. It is prepared as thick film coating, cured by UV irradiation and by moisture (in shadow areas). His high viscosity and thixotropic properties allow accurate application to selected areas on the PCB (e.g. suitable for sealing and protection of components or connections on the PCB or like a dam for dam and fill applications).

The cured product is elastic with flexibility to low temperature (-40°C) and good adhesion to most substrates. Bectron® PT 4606 and provides excellent insulation properties after several wet storage conditions.
Bectron® PT 4606 satisfies the requirements of ROHS.

## Areas of application

Bectron® PT 4606 is versatile VOC-free conformal coating with excellent electrical performance, particularly suitable for electronics such as surface mount devices and hybrids. It provides good protection against moisture, corrosion and migration as well as vibration. Bectron® PT 4606 has flow properties to allow small locations to be coated without flow to other areas.

## Properties

Rapid UV curing

Moisture shadow-cure

Thermal cycling over -40°C to +120°C

Temperature resistance -40 to +120°C

Good flexibility to -40°C

Good Adhesion

Good dielectric properties

Solvent free

Highly thixotropic rheology

## Storage

In closed original containers storage for 6 months at 5-10°C. Storage at maximum 5°C is recommended to prevent an increase in viscosity. For longer storage Bectron® PT 4606 should be stored at -15 to-25°C. After longer storage a viscosity check is recommended. Containers should be sealed as the product is moisture sensitive

## Preparation

The components to be coated should be clean dry and free from grease and compatibility between the resin and all materials on a PCB should be checked prior to use. Residual water from washing the PCB can cause bubbles so low solids flux or alcohol based cleaning materials are recommended.

## Processing

Bectron® PT 4606 can be applied usually by dispensing.
An opened container should be used within 3 days.
Thinner Bectron 300 can be used to remove liquid Bectron PT 4606 and clean the equipment.

## Curing

Curing in UV light requires 5 – 30 seconds (according to UV-Intensity).
The colour change from blue to greenish indicates the degree of UV-curing. Post-curing by moisture in shadow areas takes 2 to 3 days.
Full polymerisation of the last <5 % will happen in 2 weeks time achieving full properties of the material.

## Caution

The UV reactivity is high, so sunlight or UV inspection lamps will start pre-curing, preventing the full development of the properties of the coating.

### Table 1 - Properties of materials as supplied

| **Property** | Condition | Value | Unit |
|---|---|---|---|
| Colour | | Blue | |
| Viscosity DIN 53019 | D= $10s^{-1}$, 23°C | 38.000 ± 8.000 | mPa.s |
| Density DIN EN ISO 2811-2 | 20°C | 1.12 ± 0.05 | $g/cm^3$ |
| Recommended Storage | 5-10°C | 6 | Months |

### Table 2 – Curing Conditions

| **Property** | Condition | Value | Unit |
|---|---|---|---|
| UVA | 3000 ± 1000$mJ/cm^2$ | 5 ± 2 | Sec |

### Table 3 – Thermal Properties of cured compound

| **Property** | Condition | Value | Unit |
|---|---|---|---|
| Glass transition temperature Tg IEC 61006 | penetration mode | -16 | °C |
| Linear expansions coefficient Beck M56 | above Tg | 1.8 x $10^{-4}$ | $°K^{-1}$ |
| Temperature Range | | -40 to +120 | °C |

### Table 4 - Mechanical properties of cured product

| **Property** | Condition | Value | Units |
|---|---|---|---|
| Specific Gravity (DIN 16945) | 20°C | 1.11 ± 0.05 | $g/cm^3$ |
| Hardness (ISO 868) | 23°C | 75 ± 5 | Shore A |

### Table 5 – Dielectric properties of cured compound

| **Property** | Condition | Value | Unit |
|---|---|---|---|
| Dielectric Strength IEC 60464 Part 2 | | 20 | KV/mm |
| Dielectric Constant IEC 60250 | 23°C 1KHz, | 4.2 | |
| Dielectric Dissipation, tan δ IEC 60250 | 23°C 1KHz, | 0.07 | |
| Volume resistivity IEC 60464 Part 2<br>after 7 days water storage | 20°C | 1 x $10^{11}$<br>5 x $10^{10}$ | Ω • cm<br>Ω • cm |
| Surface resistance VDE 0303 Part 3 | | 5 x $10^{11}$ | Ω |

### Table 6 - Chemical properties of cured compound

| **Property** | Condition | Value | Unit |
|---|---|---|---|
| Water absorption ISO 62 Method 1 | | 1.5 | % |

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