

EN

Preliminary Technical Data Sheet

**Bectron®****PK 5542 FLZ**

Electronic Protection System

Modified Polyurethane - One Component - Heat Cure  
Thick Film Conformal Coating - Elastic

**ELANTAS Europe Sales offices:**

Collecchio (PR) 43044 - Italy  
Strada Antolini n° 1 loc. Lemignano  
Tel +39 0521 304777 Fax +39 0521 804410

Hamburg 20539 - Germany  
Großmannstrasse. 105  
Tel +49 40 78946 0 Fax +49 40 78946 349

Quattordio (AL) 15028 - Italy  
Via San Martino, 6  
Tel +39 0131 773870 Fax +39 0131 773875

[bectron.elantas.europe@altana.com](mailto:bectron.elantas.europe@altana.com)  
[www.elantas.com/europe](http://www.elantas.com/europe)



## Description

Bectron® PK 5542 FLZ is a one-component black resin system which cures to form a soft polyurethane duroplastic with high thermal resistance. It comprises a liquid polyol system with a dispersed solid encapsulated polyisocyanate and a pigment combination selected to provide controlled rheology including some thixotropic character while maintaining superior temperature resistance & stability. It is suitable for inspection of coated areas under UV light.

Heating the resin releases the encapsulated polyisocyanate resulting in a polyaddition reaction to give a soft duroplastic cured material.

## Areas of application

The cured Bectron® PK 5542 FLZ is a black soft duroplastic suitable for chemical, shock and vibration protection of delicate components exposed to high temperature conditions.

Bectron® PK 5542 FLZ is used for the partial or selective coating of SMDs and other components groups on printed circuit boards and ceramic substrates. It can also be applied as a casting/potting resin for electronic components and sensors, automotive electronics, plugs etc, up to temperature of 150°C.

The viscosity is moderate with slight thixotropic properties for selective thick coating of components or potting of PCB's or hybrids in housings.

## Properties of cured product

Recommended curing temperature is:

- 30 minutes at 90°C

For volume production the application of infrared (IR) radiation on thick coating leads to a considerable reduction of curing times, e.g. values of <10 minutes are attainable.

## Storage and stability

Containers filled with Bectron® PK 5542 FLZ should be stored at a temperature of -10°C to +25°C and kept closed to protect the resin against humidity.

During longer storage periods of the containers, some settling of the pigments can occur and it is advisable to homogenise the resin by rotation of the containers prior to filling storage or service tanks.

## Preparation

Prior to processing the resin compound in a storage tank should again be stirred well, e.g. 10 minutes at 20 rpm. Vacuum is not needed, but a nitrogen atmosphere is advisable to protect from humidity.

To ensure satisfactory adhesion on the PCB surface the following should be checked:

- Use of residue-free flux
- Ensure dry surfaces
- Check compatibility of the coating resin with the solder resist and solder paste.

## Processing methods

Bectron® PK 5542 FLZ can be applied with dispenser or similar dispensing equipment. The lower viscosity of Bectron® PK 5542 FLZ allows coating of large areas of a PCB by with suitable nozzles and for potting of electronic components and sensors.

Rapid selective coating of PCBs with a thick film can be achieved with suitable proprietary nozzles in a robot controlled applicator.

## Curing/Post-curing

The cured material displays high elasticity and strength. Bectron® PK 5542 FLZ is suitable for brief exposure up to 150°C. The material shows very good short time temperature cycling behavior within the range of -40°C to +150°C as well as resistance to vibration.

Bectron® PK 5542 FLZ has excellent chemical resistance to a wide range of aggressive liquids common in automotive applications.

Bectron® PK 5542 FLZ has good adhesion on almost all materials used in the field of electronics. Even after several temperature cycles there is no loss of adhesion mechanical and electrical properties.

- Satisfies ROHS Directive

## Handling precautions

Refer to the safety data sheet and comply with regulations relating to industrial health and waste disposal.

## Sales specifications

| Properties         | Conditions         | Test Method                       | Value       | M/U     |
|--------------------|--------------------|-----------------------------------|-------------|---------|
| Viscosity          | 23 °C - Z3, D=15/s | DIN 53019 (Internal Test V18/b/c) | 4000 ÷ 6000 | mPa·s   |
| Hardness Shore A/1 | 23 °C              | ISO 868 (Internal Test M30b)      | 60 ÷ 80     | Shore A |
| Gel time           | 90 °C              | DIN 16945 (Internal Test H17B1)   | 3,0 ÷ 7,0   | min     |

## Typical system properties

| Properties | Conditions       | Test Method                    | Value       | M/U    |
|------------|------------------|--------------------------------|-------------|--------|
| Shelf life | -10 °C to +25 °C | Internal Test                  | 6           | months |
| Density    | 23 °C            | ISO 2811-2 (Internal Test S11) | 1,35 ÷ 1,45 | g/cm³  |
| Curing     | 90 °C            | Internal Test                  | 25 ÷ 35     | min    |

## Typical thermal properties of the cured product

| Properties                        | Conditions    | Test Method             | Value     | M/U     |
|-----------------------------------|---------------|-------------------------|-----------|---------|
| Thermal conductivity              | 50 °C         | ASTM D5470-12           | 0,5 ÷ 0,6 | W/(m·K) |
| Glass transition temperature (Tg) |               | TMA (Internal Test M56) | -60 ÷ -50 | °C      |
| Coefficient of thermal expansion  | -40 to 150 °C | TMA (Internal Test M56) | 170 ÷ 220 | ppm/K   |

## Typical dielectric properties of the cured product

| Properties             | Conditions                     | Test Method                     | Value              | M/U   |
|------------------------|--------------------------------|---------------------------------|--------------------|-------|
| Tracking Index         |                                | IEC 60112                       | > 600 C            | CTI   |
| Dielectric Strength    | 23 °C                          | IEC 60455-2 (Internal Test M31) | >20                | kV/mm |
| Dielectric constant    | 23 °C, 10 kHz                  | IEC 60250 (Internal Test M3b)   | 5,5 ÷ 7,0          |       |
| Volume resistivity     | Initial Value, RT              | IEC 60455 Part 2                | > 10 <sup>11</sup> | Ω·cm  |
|                        | after 7 days water storage, RT |                                 | > 10 <sup>10</sup> | Ω·cm  |
|                        | 155 °C                         |                                 | > 10 <sup>8</sup>  | Ω·cm  |
| Dielectric Dissipation | 23 °C, 10 kHz                  | IEC 60250                       | 0,030 ÷ 0,045      |       |

## Typical chemical properties of cured compound

| Properties       | Conditions     | Test Method                          | Value     | M/U |
|------------------|----------------|--------------------------------------|-----------|-----|
| Water Absorption | 24 h / 23 °C   | DIN EN ISO 62 (Internal Test M09a/b) | 150 ÷ 300 | mg  |
|                  | 0,5 h / 100 °C |                                      | 100 ÷ 250 | mg  |

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