Three Bond 2273E

(One-Component Epoxy Resin for Induction bonding)

Three Bond 2273E is a heat curing, one-component epoxy resin without solvent. This resin is specially developed for the instant induction curing with HF-coils and can be excellently used for bonding and fixing materials such as ferrite and steel.

1. Features

- Extremely simple application by means of automatic dispensing systems as the product is one-component and free from solvents (no weighing, stirring or mixing required).
- The fast curing of the resin allows considerable energy savings and facilitates the automation of assembly works thus enabling an integration of On-Line manufacturing processes without requiring manual works.
- As the resin contains more than 99 % of nonvolatile matters, there is only a minimal shrinkage and outgassing while curing.
- The cured resin excels in excellent electric properties as well as in a great solidity and very good chemical resistance.

2. Typical characteristics:

a. Table 1: Properties

Test Item	Result	Unit
Colour	White	
Viscosity at 25°C	70	Pa·s
Density at 25°C	1.16	g/cm³
Curing time at 150°C (in oven)	30	Min.
Shore-Hardness	84 D	
Shear strength Fe/Fe	40	MPa
Glass transition temperature (DMA, E")	120	°C
Coefficient of thermal expansion α_1 α_2	67×10^{-6} 194×10^{-6}	$°C^{-1}$ $°C^{-1}$
Water absorption (100°C x 1 h)	+ 1.8	%
Volume resistivity	6.7×10^{13}	Ω·m
Surface resistivity	7.8×10^{15}	Ω
Dielectric constant at 1 MHz	3.12	
Dielectric dissipation factor at 1 MHz	0.025	
Breakdown voltage	31	kV / mm
Shelf life at 5°C	7	months

b. Table 2: Lap shear strength after Heat Aging

Heat aging at 150°C	2273E Lap shear (MPa)		
Condition	AL/AL	Fe/Fe	Fe/ magnet
Initial	41.36	49.18	15.24
1 week	46.66	46.66	13.09
2 week	37.30	48.60	12.36
3 week	36.60	43.02	21.13
4 week	31.30	43.64	17.90
6 week	31.86	41.02	17.87

Note: Magnet broke during the testing. Lap shear strength of Fe/ magnet would have resulted in higher values.

c. Table 3: Lap shear strength after Thermal Shock

Thermal Shock 1 cycle: 120°C to -40°C for 1hour	2273E Lap shear (MPa)		
Condition	AL/AL	Fe/Fe	Fe/ magnet
Initial	41.36	49.18	15.24
4 cycle	42.77	42.53	11.80
12 cycle	45.37	45.87	15.10
16 cycle	41.37	49.00	12.95
20 cycle	44.63	45.27	9.100

Note: Magnet broke during the testing. Lap shear strength of Fe/ magnet would have resulted in higher values.

d. Table 4: Impact Strength Properties

Condition	Substrate	Impact Toughness (kgf.cm/cm^2)
Initial	Fe /Fe	**45.54**
6 week Heat Aging at 150°C		**60.27**
20 cycles Thermal Shock (1 cycle: 120°C to -40°C for 1hour)		**68.47**
Initial	Fe /Magnet	**12.86**
6 Week Heat Aging at 150°C		**9.82**
20 cycles Thermal Shock (1 cycle: 120°C to -40°C for 1hour)		**18.39**

Note: The magnets split and broke during testing, absorbing shock that would have resulted in higher values.

3. Handling

- Keep the epoxy resin tightly closed in the original container and store it in a dark, dry, sufficiently ventilated and cool place.
- Before opening the container let the product reach room temperature as otherwise the formation of dew would be resulting.
- In order to obtain optimal results remove humidity, fat and other impurities from the fitting surface.
- According to the nature of the joints (width, surface roughness, and unevennesses) apply an appropriate quantity of epoxy resin uniformly on one of the fitting surfaces and join the parts immediately, position them correctly and fix them.
- The degree of curing varies depending on the thickness of the coating, the ambient temperature and the duration of the process.
- When a precision resin is used, changes in viscosity versus the ambient temperature are to be verified.
- Resin once transferred into another container should not be returned to the original container. Excess sealant can be easily wiped off with a cloth.

4. Size Packaging

310 ml cartridges and 20 kg pail cans