

**Evaluation Testing Of Cluster Block Housings Molded
Using Alternate Resins**

1. INTRODUCTION

1.1. Purpose

Testing was performed to evaluate cluster block housings part numbers 1217186-1, 360050-1 and 360051-1 molded using alternate resins, Valox 325, Celanex 2002-2, and Pocan B1305 to determine if they perform satisfactorily when compared to cluster block housings molded using Valox 310.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of cluster block housings molded from alternate resins when subjected to contact retention, dielectric withstanding voltage, weight loss, heat resistance, and chemical requirements tests specified in Product Specification 108-2008, Revision E. Testing was performed at the Harrisburg Electrical Components Test Laboratory between 09Jan09 and 03Feb09. The test file numbers for this testing are EA20090008T (contact retention), EA20090009T (dielectric withstanding voltage), EA20090011T (weight loss) and EA20090071T (heat resistance). This documentation is on file at and available from the Harrisburg Electrical Components Test Laboratory. The chemical requirements test was performed by Eltek Laboratories, 248 Hughes Lane, St. Charles (St. Louis), MO. between 20Feb09 to 27Feb09. The test file number for this testing is 090123-10-RJ.

1.3. Test Specimens

Test Group	Quantity	Part Number	Description
EA20090008T			
1	15	1217186-1	Valox 325 housing with terminals crimped to 12 AWG stranded wire
2	15	1217186-1	Celanex 2002-2 housing with terminals crimped to 12 AWG stranded wire
3	15	1217186-1	Pocan B1305 housing with terminals crimped to 12 AWG stranded wire
4	15	1217186-1	Valox 310 housing with terminals crimped to 12 AWG stranded wire
EA20090009T			
1	15	360051-1	Valox 325 housing with terminals crimped to 12 AWG stranded wire
2	15	360051-1	Celanex 2002-2 housing with terminals crimped to 12 AWG stranded wire
3	15	360051-1	Pocan B1305 housing with terminals crimped to 12 AWG stranded wire
4	15	360051-1	Valox 310 housing with terminals crimped to 12 AWG stranded wire
EA20090011T			
1	15	1217186-1	Valox 325 housing
2	15	1217186-1	Celanex 2002-2 housing
3	15	1217186-1	Pocan B1305 housing
4	15	1217186-1	Valox 310 housing

Figure 1 (continued)

Celanex is a Trademark of the Celanese Corporation
Pocan is a Trademark of the Bayer Aktiengesellschaft Corporation
Valox is a Trademark of the General Electric Company

Test Group	Quantity	Part Number	Description
EA20090071T			
1	15	360050-1	Valox 325 housing
2	15	360050-1	Celanex 2002-2 housing
3	15	360050-1	Pocan B1305 housing
4	15	360050-1	Valox 310 housing
5	15	1217186-1	Valox 325 housing
6	15	1217186-1	Celanex 2002-2 housing
7	15	1217186-1	Pocan B1305 housing
8	15	1217186-1	Valox 310 housing
090123-10-RJ			
1	15	360051-1	Valox 325 housing
2	15	360051-1	Celanex 2002-2 housing
3	15	360051-1	Pocan B1305 housing
4	15	360051-1	Valox 310 housing

Figure 1 (end)

2. SUMMARY OF TESTING

2.1. Contact Retention

All contact retention measurements were greater than 60 N [14 lbf] for high force product. Consolidated data is shown in Figure 2.

Reading	Material Type			
	Valox 325	Celanex 2002-2	Pocan B1305	Valox 310
Minimum	17.08	19.64	19.04	19.58
Maximum	22.37	23.63	23.30	23.35
Average	20.00	21.88	21.46	21.98
Standard Deviation	1.24	0.91	1.11	0.81

NOTE All values shown in N [lbf].

Figure 2

2.2. Dielectric Withstanding Voltage

No dielectric breakdown or flashover occurred.

2.3. Weight Loss

All weight loss measurements were less than 15 milligrams, the average weight loss for each resin was as follows:

- Valox 325: 0.1 mg
- Celanex 2002-2: 0.9 mg
- Pocan B1305: 0.4 mg
- Valox 310: 1.1 mg

2.4. Heat Resistance

No evidence of blistering, delamination or degradation was visible as a result of exposing the specimens to an elevated temperature.

2.5. Chemical Requirements

- A. Specimens molded using Valox 325, Pocan B1305 and Valox 310 did not exceed 3% dimensional change, form sludge in the test oil, cause the acidity of the oil to exceed 0.2 cc [.01 cu in] using 0.1 N of sodium hydroxide per 100 cc [6.1 cu in] of oil after 2 hours at room temperature, or cause the saponification number of the oil to exceed 0.01 cc [.0006 cu in].
- B. Specimens molded using Celanex 2002-2 caused the acidity of the oil to exceed 0.2 cc [.01 cu in], using 0.1 N of sodium hydroxide per 100 cc [6.1 cu in] of oil after 2 hours at room temperature. Actual reading of 0.53 cc [.03 cu in].

3. TEST METHODS

3.1. Contact Retention

The force required to remove individual contacts from the housing was measured using a tensile/compression device with a free floating fixture and a rate of travel of 25.4 mm [1 in] per minute.

3.2. Dielectric Withstanding Voltage

A test potential of 2.7 kilovolts AC was applied between adjacent contacts for 1 minute and then returned to zero.

3.3. Weight Loss

Specimens were baked at 138/160°C [280/320°F] for 6 hours to remove moisture. Immediately after removal from the oven, the specimens were placed in a desiccator containing silico aluminate zeolite and allowed to cool for 1 hour. After the 1 hour period, the specimens were weighed. The specimens were replaced in the oven and baked at 120/122°C [248/252°F] for 24 hours. Immediately after removal from the oven, the specimens were placed in a desiccator containing silico aluminate zeolite and allowed to cool for 1 hour. After the 1 hour period, the specimens were weighed and the results compared with the original recorded weights.

3.4. Heat Resistance

Specimens were subjected to a temperature of 163°C [325 °F] for 6 hours.

3.5. Chemical Requirements

Specimens were measured for overall length, width and height dimensions and then dried for 16 hours at 105°C [221°F]. After drying, specimens were placed in a vessel and immersed in 55 cc [3.36 cu in] of Trane oil 00037 to a depth of 50% and place in an atmosphere of Freon 22 (340.2 g [12 oz]) at a pressure of approximately 517.11 kPa [75 psig] and subjected to 107°C [225°F] for 100 hours. After removal from the vessel, specimens were again measured for overall length, width and height and tested for acidity and saponification.