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DESY-MAG-M-1000-B

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1. Scope:

This specification establishes the material requirements and quality assurance requirements for the compression molded parts to be used as mechanical supports and restraints in the D.E.S.Y. Luminosity upgrade magnets. These items are made of an amorphous thermoplastic copolymer with glass fiber reinforcement.

2. Applicable Documents:

2.1 Specifications:

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issue date or revision level shall be that in effect on the date of the invitation to quote:

ASTM D256	Impact Resistance of Plastics and Electrical Insulating Materials
ASTM D638	Tensile Properties of Plastics
ASTM D648	Deflection Temperature of Plastics Under Flexural Load
ASTM D695	Compressive Properties of Rigid Plastics
ASTM D696	Coefficient of Linear Thermal Expansion of Plastics
ASTM D790	Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM D955	Compressive Properties of Rigid Plastics
BNL-QA-101	BNL Seller Quality Assurance Requirements
ULT-306G (4/90)RTB	ULTEM Polyetherimide Resin, General Electric Co.

3. Requirements:

3.1 Molding Material:

The molding material to be used, shall be the following:

Resin identification:	ULTEM [®] 2300
Manufacturer/Supplier:	General Electric Co. One Plastics Ave. Pittsfield, MA 01201 (800) 845-0600 (413) 448-6341

This resin is based on a polyetherimide copolymer containing 30% fiberglass reinforcement. The molded products from this material offer high temperature resistance and high mechanical strength.

3.2 Testing, Analysis, and Certification of the Molding Material:

3.2.1 A Certificate of Chemical and Physical Analysis shall be obtained from General Electric Co., for each production lot (batch) of molding material ordered. This report shall be based on a series of lab tests performed on samples molded from each lot of material. The analysis must include the following measurements which must be within the values listed (Ref: G.E. Co. document listed previously) below unless otherwise stated:

<u>Property (as molded)</u>	<u>Test Method</u>	<u>Value</u>
Izod Impact, notched, .125 in. 23 ⁰ C	ASTM D256	1.5 ft.lb/in. minimum
Flexural Strength(Yield)	ASTM D790	32 kpsi minimum
Flexural Modulus	ASTM D790	1.2 x 10 ⁶ psi minimum
Tensile Strength, yield Type 1	ASTM D638	23,000 psi minimum

3.2.2 A copy of the Certificate of Chemical and Physical Analysis shall be provided with each shipment to Brookhaven National Laboratory.

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- 3.2.3 Lab tests shall be performed on samples molded from each lot of material and a report shall be generated indicating the results. The analysis must include the following measurements which must be within the values listed below unless otherwise stated:

<u>Property (as molded)</u>	<u>Test Method</u>	<u>Value</u>
Compressive Strength	ASTM D695	29,000 psi minimum

- 3.2.4 A copy of the test report shall be provided with each shipment to Brookhaven National Laboratory.

3.3 Process Uniformity:

Since uniformity of the mechanical and electrical characteristics of the parts specified herein is fundamentally important to the successful operation of DESY magnets, there shall be no change in manufacturing methods during the entire production run without prior written approval from the Buyer.

4. Quality Assurance Provisions:

4.1 Physical characteristics:

- 4.1.1 Material shall be free of visually detectable cracks, voids, or any other condition affecting the surface condition or affecting the material properties as outlined in paragraph 3.2.

4.2 Quality Assurance Requirements of BNL-QA-101

The following sections of BNL-QA-101 apply to this specification:

<u>BNL-QA-101</u>	<u>Subject</u>
3.1.2	Inspection system Requirements
4.15	Chemical and Physical Test Report
4.16	Certificate of Conformance
4.22	Lot or batch numbers
4.23	Material Traceability