

HYDRO GENERATOR ENGINEERING DIVISION

DOCUMENT NO: HGG- 1904, Rev 00

Mandatory Technical Pre-Qualification Requirements (T-PQR)

Mandatory Pre-Qualification Requirements for **Injection Moulded Insulation Caps** for hydro-generators/ motors.

S. No.	Description of pre-qualification requirement	Vendor Response	
		Complied/Not complied	Supporting Documents required to accept compliance
1	Only Manufacturers can quote.		
2	Compliance to Specification SG-12719, Rev-00.		
3	Supplier Should have at least 1 purchase orders for supply of similar injection Moulded Components in last 5 years.		Copy of PO/invoice.
4	Vendor to have Manufacturing facility for Injection Molding with Capacity to produce minimum 100 Caps per day.		Confirmation.
5	Vendors who finally qualified in technical PQR have to apply for registration in BHEL vendor directory. (If not registered).		Confirmation.
6	After Placement of PO, L1 Supplier to submit 10 Nos. free samples of Insulation Cap for BHEL approval before mass manufacturing.		Confirmation.

Note:

1. Compliance to above Pre-qualification requirements are mandatory. In absence of compliance of above requirements vendor PQ application is liable to be rejected.
2. BHEL has right to verify information/ confirmation furnished, by asking additional documents proofs etc


 (Vikash Mishra)
 Sr. Engineer/HGE


 (Gopal Maheshwari)
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 AGM/HGE



PRODUCT STANDARD

SWITCHGEAR ENGINEERING DIVISION

SG 12719 REV.00

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GLASS FIBRE-REINFORCED POLYAMIDE MOULDINGS TYPE PA 66 GF 30

1.0 INTRODUCTION

Glass fibre re-inforced polyamide mouldings are used as mechanical / electrical parts such as centering rings of vacuum interrupters in the assembly of vacuum circuit breakers.

2.0 MATERIAL PROPERTIES

The basic type of this thermoplastic material is Polyamide PA 66 reinforced with a mean glass fibre content of 30 % by weight and is designated by : PA 66 GF 30 generally conforming to guideline VDI/VDE 2479 sheet 2. The reference values of the main properties of this material are :

PROPERTY	UNIT	TEST METHOD	VALUE
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- PHYSICAL :

Density	g/cubic cm	DIN53479	1.35
Glass content	%	-	30
Water Absorption (23 deg C, saturation)	%	DIN53472	5.5

- MECHANICAL

Flexural strength	N/sq mm	DIN 53452	230
Yield stress	N/sq mm	DIN 53455	190
Breaking elongation	%	DIN 53455	5
Ball pressure hardness (30s)	N/sq mm	DIN 53456	265

- ELECTRICAL

Electrical breakdown strength	KV/mm	DIN 53481	60
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- THERMAL

Melting point	Deg C	-	255
Upper temperature limits for application for a few years			
- For static loading	Deg C	-	170
- For impact loading	Deg C	-	120
- For short temperature peaks	Deg C	-	250

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REV.		PRINTS TO :-	APPROVED -		
ALTD.		SWM(P)	R. K. Shukla		
APPD.		QCX			
DATE.		MCD	PREPARED	ISSUED	DATE
		HVD	SMM	RKK	17.07.95



PRODUCT STANDARD

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Process shrinkage
(injection moulding) % 0.3 to 0.7

FLAMMABILITY

Group as per VDE 0304 VDE0304 II C
Part 3/5.10

Trade names of equivalent materials (non-reinforced) of this category are

Trade name	Manufacturer
AKULON 'R600'	M/S AKZO, NETHERLANDS
DURETHAN 'A'	M/S BAYER, GERMANY
MARANYL 'A'	M/S ICI, UK
SNIAVITRID	M/S SNIA, ITALY
TECHNYL 'A'	M/S RHONE, FRANCE
ULTRAMID 'A'	M/S BASF, GERMANY
ZYTEL 'E'	M/S DU-PONT, USA
NAILONPLAST 'A'	M/S MONTEFIBRE, SNIA, ITALY
CELANESE NYLON	M/S
CATALIN	M/S CATALIN, USA
TORAY	M/S TOYO RAYON, JAPAN

3.0 COLOUR OF MOULDINGS

Black unless otherwise specified on drawing

4.0 DIMENSIONS AND FINISH

Dimensional and finish requirements of the mouldings shall be as per the item drg.

5.0 SUPPLIER APPROVAL PROCEDURE :

Supplier shall send few samples of the mouldings ordered before bulk supply for dimension verification and assembly trials. Also Test certificate / Guarantee certificate / Proof of using equivalent grade material shall be submitted along-with samples for approval of materials used during mfg. After the sample approval only the bulk supplies shall be made.

6.0 ACCEPTANCE CRITERION

SUPPLIER'S TEST CERTIFICATE : Supplier shall send a Test Certificate of material properties / Guarantee Certificate for use of approved material grade.

CHECKS AT BHEL : Tests for density, Glass content, water absorption and Hardness shall be conducted on the component and the values shall be as per para 2.

7.0 IDENTIFICATION OF MARKINGS

Supplier's name/logo, mfg batch no. shall be etched / marked on the flat face of the moulding surface.

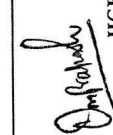
8.0 PACKING : The mouldings shall be packed suitably to protect against damages during transit and atmospheric effects.

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QUALITY ASSURANCE PLAN

QA PLAN FOR - INSULATION CAP (INJECTION MOULDED)										SHEET- 1 OF 1	
QA PLAN NO.- QSP/IQ/565 REV -00										P.I. NO.-	
DT - 18-03-2019											
SL. NO.	COMPONENT/ASSY/OPERATION	CHARACTERISTICS	CLASS	TYPE	QUANTUM OF CHECK	REF. DOC.	RECORD FORMAT	INSPECTION		REMARKS	
								P	W		
1.0	Inspection at supplier's works										
1.1	Material Identification.	Identification w. r. t. lot no./batch no.	Maj	Review	100%	SG12719	Supp. QC record	1	-	Record Reviewed By BHEL/TPIA	
1.2	Insulation cap	(a) Visual & dimensional checks .	Maj	V & D	Sample	BHEL Drawing	Supp. QC record	1	2		
		(b) Specific Gravity Test	Maj	Physical	Sample	SG12719	Supp. QC record	1	2	Witness on 5 % of Random selected samples.	
		(c) HV Test	Maj	Elect	Sample	BHEL Drawing	Supp. TC	1	2		
		(d) Finish Color	Maj	Visual	Sample	BHEL Drawing	Supp. QC record	1	2		
		(e) Marking, Packing & Dispatch	Maj	Visual	100%	BHEL drawing	Supp. QC record	1	-		
Certification - Supplier shall furnish number of copies of test certificates as called in P.O. duly countersigned by BHEL or its authorised representative incorporating the following before dispatch:- (a) Lot / Batch identification. (b) Test results for physical, chemical, electrical, proof test. (c) Dimensional record.											
Abbreviations - P- Perform, W- Witness, R- Review, 1- Supplier, 2- BHEL/TPIA, Maj- Major, V -Visual, D- Dimension, CH - Critical , TC- Test Certificate, Supp- Supplier, Mech- Mechanical, Elect- Electrical , QC- Quality Control.											
 HGE  M. Gopal  A. Dixit  NARENDRA AGRAWAL  AADHAR SHARMA QA-HYDRO आधार शर्मा / AADHAR SHARMA वरि. अभियंता (क्यू डीसी) / Sr. Asst. Engr. (QWD) गुणता नियंत्रण-जल टरबिन / Quality Control-WTM बी.एच.ई.एल. मोहन / BHEL Mohan / BHEL MOHAN											