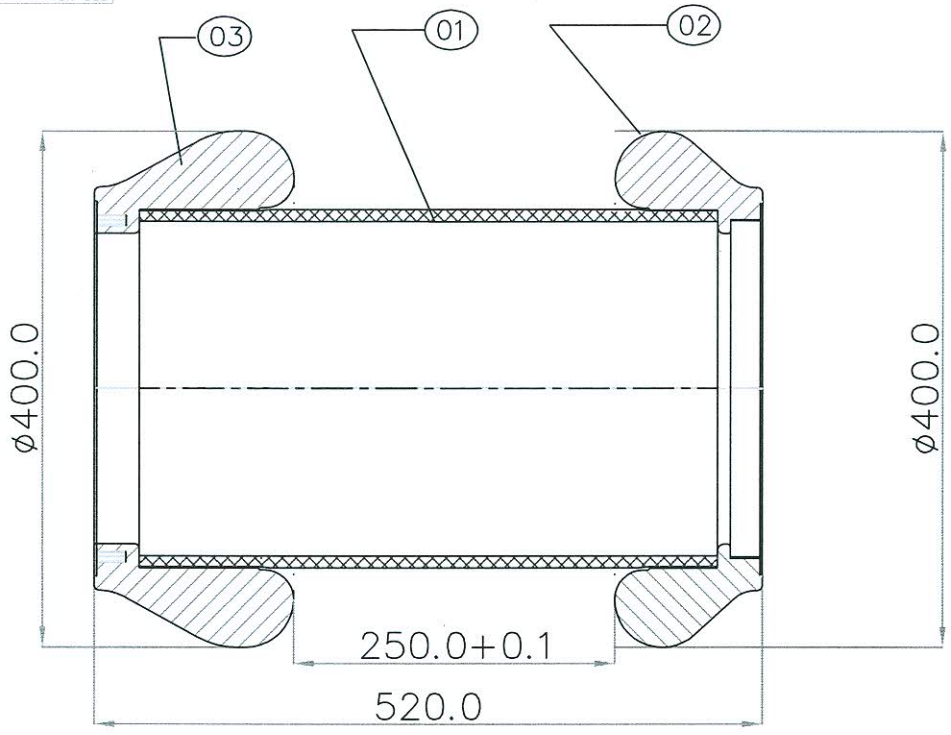
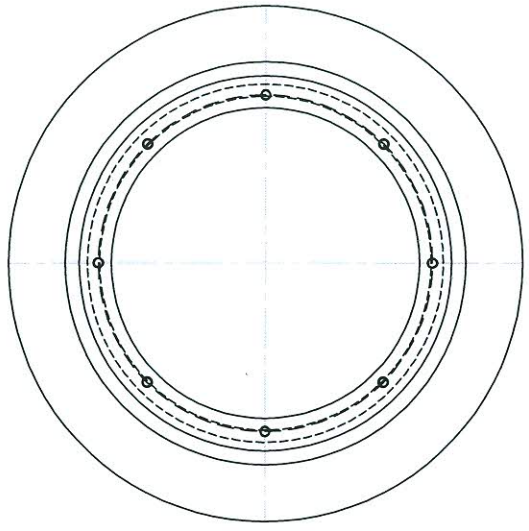
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)





VAR.00	REMARKS	VAR NO.	ITEM NO.	DESCRIPTION	STD	DRAWING NO.	IT.NO. / VAR	MATL. CODE / MATL. SPECN.	A C	UNIT	UNIT WT. / QTY.	GS	ZONE
			03	FLANGE–II		RD 06 4 35 0617 0253					01		
			02	FLANGE–I		RD 06 4 35 0617 0252					01		
			01	INSULATOR		RD 06 4 35 0617 0251					01		

Note:

1. The Arcing insulator shall be hydraulically pressure tested at 12 bar for one minute.
2. Arcing insulator assembly shall be compatible to SF6 gas.

REV.	DATE	ALTERED / CHECKED	REV.	DATE	ALTERED / CHECKED
ZONE			ZONE		

TYPE OF PRODUCT: CSM–400

NAME OF CUSTOMER

BHARAT HEAVY ELECTRICALS LTD. HYDERABAD

	NAME	SIGN.	DATE	NO.OF VAR.
DRN	KSRAO		10.11.12	
CKD	MMRAO		10.11.12	
APPD	MMRAO		10.11.12	

DEPT. / CODE	GRADE OF TOL. DIM. C/M/F	SCALE	WEIGHT(KG)	REF. TO	ITEM NO.	NO.OF ITEMS
		NTS	45.0 ±G	RD 06 4 35 0617 0250	1	

TITLE: ARCING INSULATOR

CARD CODE

DRAWING NO.: RD 06 4 35 0617 0250 REV. L

SHEET NO. / NO. OF SHEETS

INVENTORY NO. | SIGN. AND DATE | REF. DRG. NO.

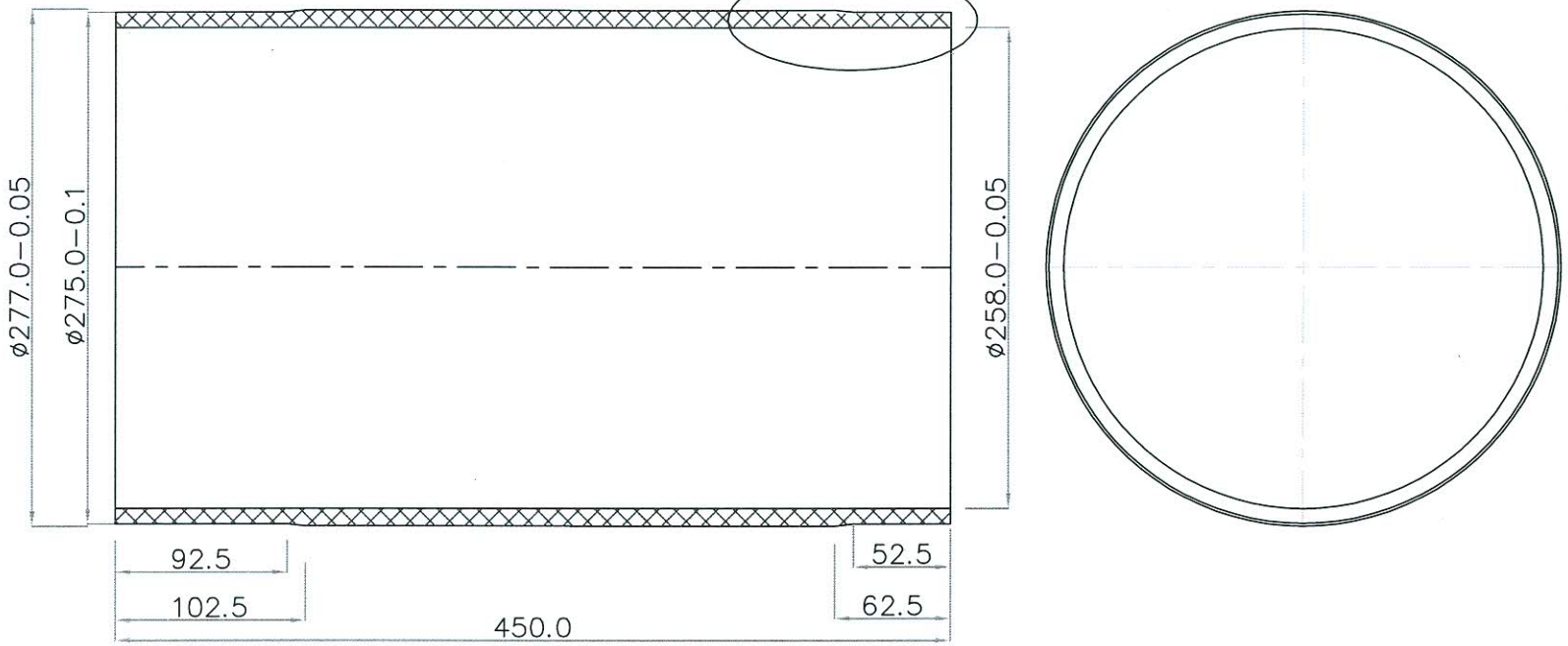
FIRST ANGLE PROJECTION

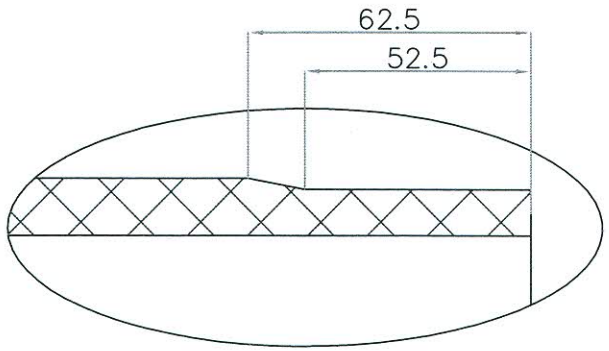
(ALL DIM NS ARE IN mm)

(~1.6)

DRG. NO.

REFER DETAIL 'A'





DETAIL 'A'

VAR.OO	REMARKS	VAR NO.	ITEM NO.	DESCRIPTION	STD	DRAWING NO.	IT.NO.	MATL. CODE	A C	UNIT	UNIT WT.	GS.	ZONE
			01	INSULATOR		4077.0X925.0X450.0		ARAMID/POLYESTER/ KEVLAR FIBER			01		
							VAR	MATL. SPECN.			QTY.		

FINAL ON 12/06/14

TYPE OF PRODUCT

NAME OF CUSTOMER CSM−400

BHARAT HEAVY ELECTRICALS LTD.
HYDERABAD

	NAME	SIGN.	DATE	NO.OF VAR.
DRN	KSRAO		10.11.12	
CKD	MMRAO		10.11.12	
APPD	MMRAO		10.11.12	

REV.	DATE	ALTERED / CHECKED	REV.	DATE	ALTERED / CHECKED
ZONE			ZONE		

DEPT. / CODE	GRADE OF TOL. DIM. C/M/F	SCALE	WEIGHT(KG)	REF. TO	ITEM NO.	NO.OF ITEMS
		NTS	5.0	PD DG 4 35 0617 0250	1	

TITLE: INSULATOR

CARD CODE

DRAWING NO. PD DG 4 35 0617 0251 REV.

SHEET NO. NO. OF SHEETS

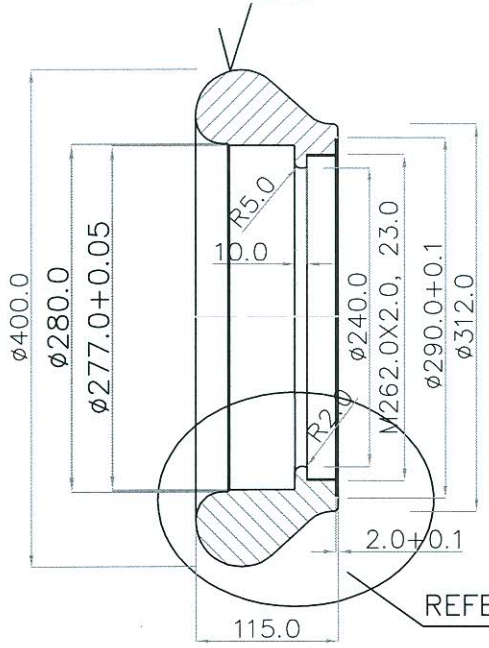
INVENTORY NO. | SIGN. AND DATE | REF. DRG. NO.

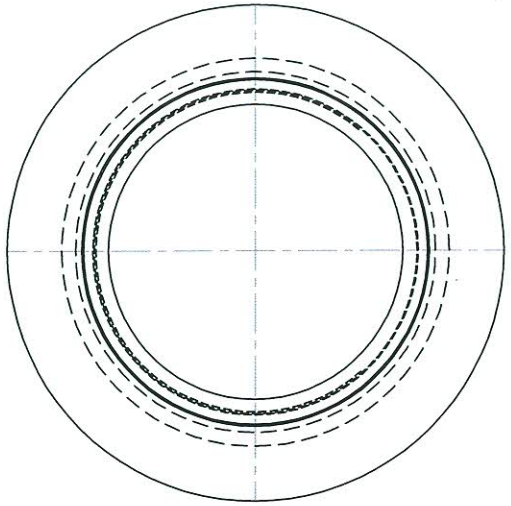
FIRST ANGLE PROJECTION

RA0.8

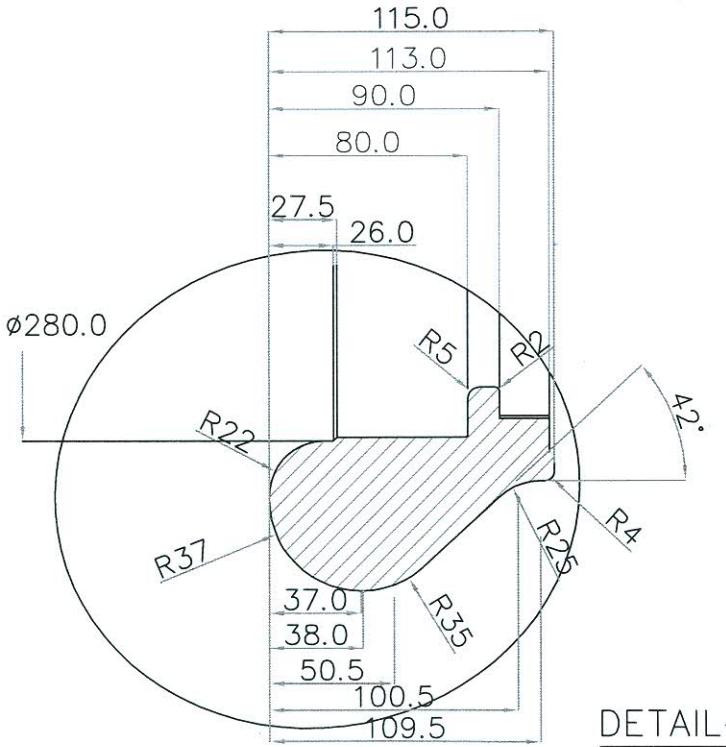
(ALL DIMENSIONS ARE IN mm)

(~1.6)





REFER DETAIL 'A'



DETAIL–'A'

ALL SHARP EDGES SHALL BE MACHINED TO 0.5X45°

PROFILED SURFACE SHALL BE FINE FINISHED TO RA0.8

			01	FLANGE		ø410.0xø200.0x120.0			Al. Alloy				01				
VAR.00	REMARKS	VAR NO.	ITEM NO.	DESCRIPTION	STD	DRAWING NO.	IT.NO. VAR	MATL. CODE MATL. SPECN.	A C	UNIT	UNIT WT. QTY.	QS	ZONE

FINAL ON 12/06/14

TYPE OF PRODUCT: GSM–420

NAME OF CUSTOMER

BHARAT HEAVY ELECTRICALS LTD. HYDERABAD

	NAME	SIGN.	DATE	NO.OF VAR.
DRN	KSRAO		10.11.12	
CKD	MMRAO		10.11.12	
APPD	MMRAO		10.11.12	

REV.	DATE	ALTERED / CHECKED	REV.	DATE	ALTERED / CHECKED
ZONE			ZONE		

DEPT. CODE | GRADE OF TOL. DIM. C/M/F | SCALE: NTS | WEIGHT(KG) | REF. TO: PD DG 4 35 0617 0250 | ITEM NO. 1 | NO.OF ITEMS

TITLE: FLANGE–I

CARD CODE

DRAWING NO.: PD DG 4 35 0617 0252 | REV.

SHEET NO. | NO. OF SHEETS

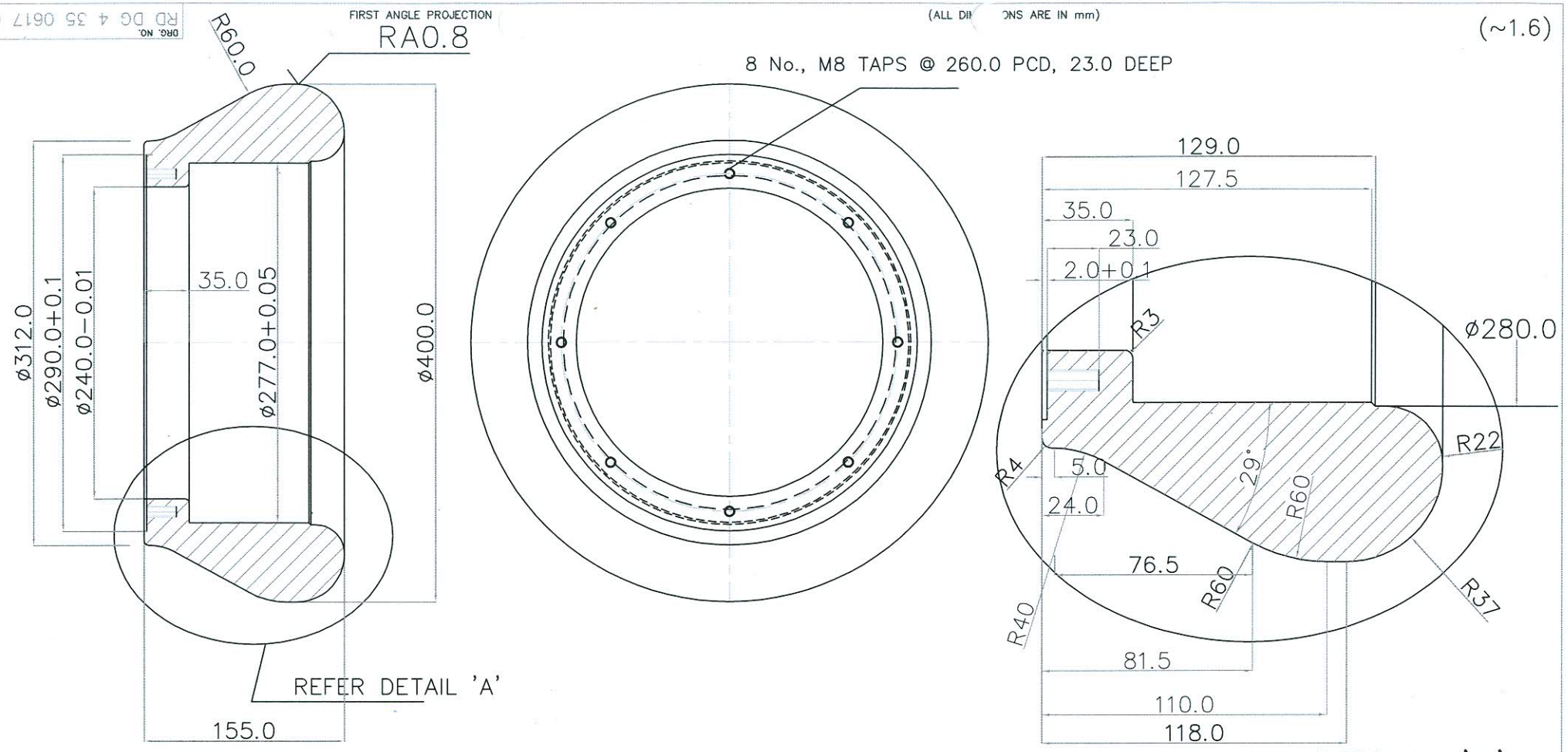
INVENTORY NO. | SIGN. AND DATE | REF. DRG. NO.

DRG. NO. RD DG 4 35 0617 0253

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

(~1.6)



INVENTORY NO. | SIGN. AND DATE | REF. DRG. NO.

VAR.00	REMARKS	VAR NO.	ITEM NO.	DESCRIPTION	STD	DRAWING NO.	IT.NO. VAR	MATL CODE / MATL SPECN.	A C	UNIT	UNIT WT. / QTY.	GS	ZONE
			01	BLOCK		6402.0 A500.0x160.0		Al. Alloy			43.0 kg / 01		

ALL SHARP EDGES SHALL BE MACHINED TO 0.5X45°

PROFILED SURFACE SHALL BE FINE FINISHED TO RA0.8

FINAL ON 12/6/14

REV.	DATE	ALTERED / CHECKED	REV.	DATE	ALTERED / CHECKED
ZONE			ZONE		

TYPE OF PRODUCT

NAME OF CUSTOMER GSM–420

BHARAT HEAVY ELECTRICALS LTD.
HYDERABAD

	NAME	SIGN.	DATE	NO.OF VAR.
DRN	KSRAO		10.11.12	
CKD	MMRAO		10.11.12	
APPD	MMRAO		10.11.12	

DEPT. CODE	GRADE OF TOL. DIM. C/M/F	SCALE	WEIGHT(KG)	REF. TO	ITEM NO.	NO.OF ITEMS
		NTS	20.0	RD DG 4 35 0617 0250	1	

TITLE: FLANGE–II

CARD CODE

DRAWING NO. RD DG 4 35 0617 0253 REV.

SHEET NO. NO. OF SHEETS

PSGSG106	SPECIFICATIONS FOR Arcing Insulators	Drg.No.	RD DG 4 35 0617 0250
		Date	29.12.14
		Product	GSM-400

1.0 APPLICATION:

Tubular insulator with metal flanges is a part of a high voltage, heavy duty switchgear. The component is intended for a 420 kV AC, 50 Hz System.

2.0 SPECIFICATION:

2.1 <u>TUBE MATERIAL</u>

2.1.1 The POLYESTER lining used for tube shall have following properties:

#	Property	Unit	Value
1	Density	g/ccm	~1.3
2	Tensile Strength	N/cm	~1000
3	Impulse dielectric Strength	kV/mm	≥ 16
4	Relative permittivity	-	~3.4
5	Dielectric loss factor	%	~0.4
6	SHRINKAGE15 HR160 °C	%	≤ 2
7	SHRINKAGE	%	< 0.5
8	Water Absorption	%	< 0.5
9	Water Absorption @ 100^{0}C	%	< 0.5

2.1.2 **Type of Fiber:** Aramid / Kevlar or a combination of these fibers. The material shall be resistant against arced SF6.

Contd..

	2.1.3	**Manufacturing process:** The fibers shall be wound and impregnated with hot curing epoxy resin in vacuum/ pressure. The casting shall be void free and shall achieve required electrical and mechanical properties. The epoxy used shall be compatible to arced SF6 gas.
	2.1.4	The inside diameter of the tube shall be lined with (0.4-0.6mm) arc resistance material (compatible to arced SF6) to minimize the filament erosion by arced SF6.
	2.1.5	The processed material shall have good Chemical resistance against organic and inorganic acids.
	2.1.6	The shape of the tube shall be in accordance to the approved drawing.
2.2		**METAL INSERTS**
	2.2.1	Profiled metal inserts as per approved drawing shall be machined using NC machining from mechanical grade aluminum alloy as per (DIN/BIS/IS standards).
	2.2.2	The aluminum flanges shall be glued to the epoxy tube using a hot curing adhesive (compatible to arced SF6 gas) and joined as per the practices of the supplier.
	2.2.3	The bonding between insulator and metal flanges shall be done without roll pins /threaded bolts/ cross bolts. The bonding shall not only withstand specified mechanical forces but also offer leak tightness for use in differential pressure application.
3.0		**FACTORY TEST**
	3.1	Dimensional report
	3.2	Mechanical load bearing capability (Tensile, 100 kN+ 10%). Necessary test shall be conducted. Breaking load shall be minimum of 200kN.

4.0 **QUALIFYING REQUIREMENTS:**

The supplier shall be of national / International repute with proven record and should have supplied similar material for gas insulated circuit breaker applications. These insulators shall be used for GIS application and for these applications performance reference shall be submitted.

5.0 **GENERAL**

5.1 Metal Flanges shall be free from sharp corners. Wherever not specified in the drawing, a radius of R 0.5mm shall be provided at unspecified corner/Edge.

5.2 The components shall be packed individually in appropriate packing so as to prevent transit damages.

5.3 The components shall be guaranteed against all manufacturing defects.

5.4 In case of doubts in specifications, the supplier shall contact BHEL for clarifications.