SPECIFICATION FOR ALUMINIUM ENCLOSURES FOR GVM36

1.0 Introduction

This specification governs the Properties, Manufacturing, Testing, Inspection, Packing and Supply of Aluminum Enclosures for GIS.

2.0 Applications:

The Aluminum Enclosure used in GVM36 to provide the SF6 gas insulation to all High Voltage components.
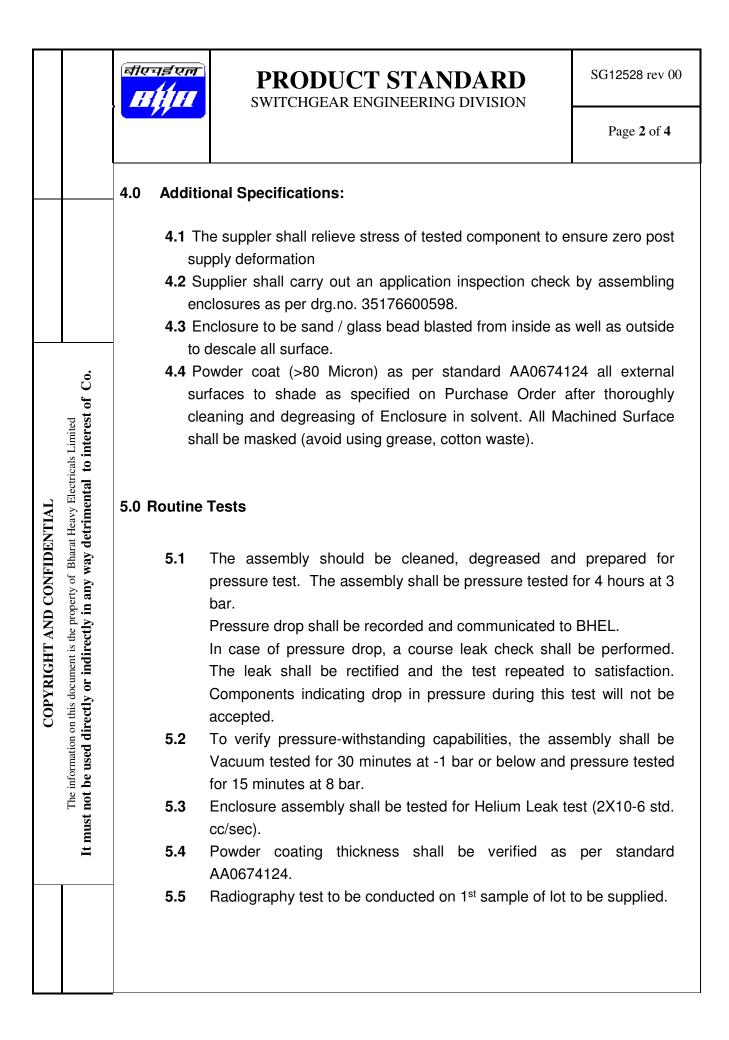
3.0 Material specification:-

Material shall comply as per below standards

EU	USA	Germany	Japan	Inter
EN	-	DIN,WNr	JIS	ISO
ENAC-AlSi7Mg0.3	A356.0	3.2371	AC4CH	AlSi7Mg0.3
		G-AlSi7Mg		

Chemical composition % of grade ENAC-AlSi7Mg0.3 (ENAC-42100)							
Fe	Si	Mn	Ti	Cu	Mg	Zn	Others
max 0.19	6.5 - 7.5	max 0.1	max 0.25	max 0.05	0.25 - 0.45	max 0.07	each 0.03; total 0.1

Mechanical properties of grade ENAC-AlSi7Mg0.3 (ENAC-42100)	
Tensile strength (MPa)	230
$R_{p0.2}$ 0.2% proof strength (MPa)	190
Min. elongation at fracture (%)	2
Brinell hardness (HBW):	75

REV.		PRINTS TO:-		APPROVED		
ALTD.		PDG	1	SKP		
APPD.		SWM	1	PREPARED	ISSUED	DATE
DATE.		C.FILE	1	JAG		24-Apr-19

4.0 Additional Specifications:

4.1 The suppler shall relieve stress of tested component to ensure zero post supply deformation

4.2 Supplier shall carry out an application inspection check by assembling enclosures as per drg.no. 35176600598.

4.3 Enclosure to be sand / glass bead blasted from inside as well as outside to descale all surface.

4.4 Powder coat (>80 Micron) as per standard AA0674124 all external surfaces to shade as specified on Purchase Order after thoroughly cleaning and degreasing of Enclosure in solvent. All Machined Surface shall be masked (avoid using grease, cotton waste).

5.0 Routine Tests

5.1 The assembly should be cleaned, degreased and prepared for pressure test. The assembly shall be pressure tested for 4 hours at 3 bar.

Pressure drop shall be recorded and communicated to BHEL.

In case of pressure drop, a course leak check shall be performed. The leak shall be rectified and the test repeated to satisfaction. Components indicating drop in pressure during this test will not be accepted.

5.2 To verify pressure-withstanding capabilities, the assembly shall be Vacuum tested for 30 minutes at -1 bar or below and pressure tested for 15 minutes at 8 bar.

5.3 Enclosure assembly shall be tested for Helium Leak test (2X10-6 std. cc/sec).

5.4 Powder coating thickness shall be verified as per standard AA0674124.

5.5 Radiography test to be conducted on 1st sample of lot to be supplied.

6.0   **QA Plan**

QA Plan shall be submitted along with offer & got approved before supply. This shall include tests & measurements on raw material, semi-finished / finished products and details of manufacturing process followed including tools, jigs & fixtures /gauges used at different stages to ensure quality of end product.

7.0   **Packing**

The accepted component shall be packed in wooden boxes with suitable PVC covers on the flanges to prevent transit damages. A thick polyethylene cover shall be used to seal to component from ingress of moisture and water. Adequate quantity of moisture absorbent shall also be placed with the component.

Protective mask should not be removed till final assembly in the manufacturing.

Mask should have stickers ``do not remove before final assembly''.

8.0   **Punching**

Punch mark showing Supplier's Name or Monogram / Pressure test / Helium leak test as under at location marked in drawing shall be provided.

Punch mark for enclosure serial no/pressure test/helium leak test / supplier code as below :-

    PRESSURE TEST   : P

    HELIUM LEAK TEST   : He

    SUPPLIER CODE IN BHEL : XXXXX

    PUNCH MARK

        XXXXX / P / He / MONTH - YEAR - RUNNING SERIAL

 EXAMPLE S0101 / P / He / 08 – 19 – 019

Each package shall be legibly and indelibly marked with the following:
a. Component name ,Drawing no and Rev no
b. BHEL Purchase Order No.
c. Batch/Lot No.
d. Manufacturer's /Suppliers Name
e. Size & Quantity supplied
f. Net & Gross Weight

9.0 ACCEPTANCE CRITERIA

Following certificates shall be furnished for acceptance of the component:

- Detailed Dimensional report of 1st sample in CMM.
- Dimensional report as per drawing for lot qty.
- Raw Material certificate.
- Pressure drop test as per clause 5.1.
- Pressures withstand test report as per clause 5.2.
- Radiography/ Radioscopy test report as per 5.5 (applicable for 1st sample only)
- Stress relieving parameters,
- Powder coating report

A certified copy of above documents shall be sent along with the delivery note.

10.0   Guarantee certificate

The equipment shall be warranted for trouble free performance and against any defect in the material for a period of not less than 24 months from the date of supply.

11.0   Rework and Rejection:

No rework is allowed. Components not meeting our drawing and specification will be rejected and party has to replace within time. It shall be included in guarantee certificate. In the event of the material proving defective in the course of manufacture; such material shall be rejected not withstanding any previous certification of satisfactory testing and/or inspection.