

Corporate Engineering Ltd

We've Got You Covered

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SPECIFICATION

FOR

GRP ROTATING

COVERS

1.0 GENERAL

- 1.1 The circular 'rotating' cover shall be constructed from Glass Reinforced Polyester (GRP) and shall be designed to accommodate the tolerances of the tank to $\pm 25\text{mm}$ and all loads imposed during handling, construction, transportation, erection and installation.
- 1.2 Covers shall be of an interlocking or overlapping design and pitched sufficiently to prevent ponding.
- 1.3 The cover shall be centrally supported from a purpose made support frame fitted to the underside of the half-bridge/scrapper mechanism. The suitability to fit and support the cover from the bridge will be defined by others. On new equipment the cover and bridge manufacturers will liaise with the main contractor throughout the design stage to ensure compatibility and interfaces.
- 1.4 The periphery of the cover shall be supported on top of the tank wall.
- 1.5 The periphery of each cover section shall be fitted with stainless wheels fitted with polypropylene tyres and sealed for life bearings on which the cover will rotate.
- 1.6 The cover shall include a peripheral water seal, preference will be given to a frictionless arrangement that also prevents wind lift of the cover.
- 1.7 Covers shall be designed to take account of all equipment associated with the tank.
- 1.8 The covers shall be designed to withstand an internal chemical environment that would normally be expected with raw sewage and sewage sludge's.
- 1.9 Covers shall be sufficiently sealed to minimise the egress of air and ingress of precipitation under normal operating conditions.
- 1.10 Designed to operate at negative pressures when used in conjunction with a fan assisted odour control system.
- 1.11 Designed for a life expectancy of 25 years without degradation of materials.
- 1.12 All fixings shall be of a stainless steel 316 grade.
- 1.13 If access/equipment hatches are required they shall be fitted with a suitable method of fixing for padlocks.
- 1.14 Access to items listed above shall be flat and have non-slip finish.

2.0 COVER LOADING

- 2.1 Covers shall be designed as defined in B.S.6399 Part 3 "NO ACCESS" (0.75kN/m²). Areas around access/mixer hatches will be designed as being "WITH ACCESS"(1.5kN/m²) and will have a non-slip walkway to the hatch and be free from trip hazards. Other areas that require "WITH ACCESS" shall be clearly defined by the client.
- 2.2 Covers shall be designed to withstand wind and snow loading as defined in B.S.6399 parts 2 and 3 and paragraph 9.2.1 of B.S. 4994 using a design factor 'K' 4.
- 2.3 Deflection shall not exceed 1/150 of the unsupported span under the action of loading. Any deflections under any imposed load shall not effect the leak tightness of the cover joints,

3.0 MATERIALS

- 3.1 Covers can be supplied in any specified shade selected from BS 4800.
- 3.2 Resins shall comply with the requirements of BS 3532 and shall have a minimum strain to failure rate of 3% and minimum heat distortion temperature of 60°C when fully cured.
- 3.3 The resins shall **not** be of the fire resistant type.
- 3.4 A translucent UV inhibitor shall be included in the outer laminate layers.
- 3.5 Reinforcing material shall be either "E" or "C" type glass mat to BS 3496 for chopped strand mat, BS 3691 for rovings or BS 3749 for woven glass fibre rovings fabric.
- 3.6 All fixings shall be manufactured from stainless steel to BS 970 Part 4 Grade 316S16.

4.0 WEATHER PROTECTION - SURFACE FINISH

- 4.1 The following factory tests shall be carried out by the Contractor and witnessed by the engineer.
- 4.2 Resin dry areas - on moulded and corrosion resistant surfaces, such areas may be accepted provided they do not exceed 6mm in diameter if made good, not more than 0.5% of the surface area shall be so affected. On other surfaces all resin dry areas shall be repaired.

- 4.3 Scratches - on moulded and corrosion resistant surfaces, scratches shall not exceed 0.5mm deep may be accepted without repair provided no glass fibres are exposed.
- 4.4 The total extent of the scratching shall not exceed 200mm length per 1 metre² or where small scratches are grouped together, the affected area shall not exceed 1% of the surface area. No repairs are acceptable.
- 4.5 On other surface, scratches may be repaired provided that structural integrity of the laminate is not impaired.
- 4.6 Voids - on moulded and corrosion resistance surfaces. Voids not exceeding 2mm diameter and 1mm deep may be repaired provided that the voids do occur in discrete clusters and the sum of the area of clusters does not exceed 0.5% of the total moulding area.
- 4.7 On other surfaces, voids may be repaired provided they do not exceed more than 20% of the laminate thickness and not more than 3% of the surface area is affected.
- 4.8 Cracking - there shall be no apparent cracking, including star cracking of any surfaces.
- 4.9 Surface - there shall be no fibres protruding from the surface of the laminates. Wrinkles and undulations shall be gradual and the surface shall be continuous at such locations.
Any such defects shall not be greater than 3mm in depth or a quarter of the laminate thickness whichever is the smaller. Such defects shall not appear extensively on single mouldings nor shall they be repeated throughout a production run.
There shall be no visible extraneous inclusions other than permitted fillers or aggregates.
- 4.10 Delamination - there shall be no visible delamination.

5.0 ENVIRONMENTAL ISSUES

- 5.1 The covers shall be able to withstand the full range of climatic conditions. In particular, they shall be designed to withstand internal and external temperatures of between -15°C and +40°C
- 5.2 The covers shall be designed to withstand an internal chemical environment which may include, in varying proportions, and in the presence of varying humidity from 0 to 100% all or any of the following chemicals:-
 - a. Oxygen
 - b. Carbon Monoxide
 - c. Carbon Dioxide
 - d. Nitrogen
 - e. Hydrogen Sulphide Gas
 - f. Methane
 - g. Propane

- 5.3 The cover shall be designed to withstand an external industrial atmospheric environment.

6.0 MAINTENANCE

- 6.1 Wheel assemblies shall be fitted with sealed for life bearings stainless steel bearings.
- 6.2 Specific maintenance sections that can be removed without disturbing the remaining sections shall be large enough to permit the removal of any plant contained beneath the covers.
Such sections shall have their own independent hook points and demonstrable method of removal.

7.0 FACTORY TESTING –RESIN

- 7.1 Test certificates shall be supplied to the engineer showing the Barcol Hardness of the cured resin used in the manufacture of the covers.

8.0 HANDLING, CONSTRUCTION, ERECTION & INSTALLATION

- 8.1 The covers shall be designed to withstand all the loads imposed during handling, construction, transportation, erection and installation.
- 8.2 To prevent over stressing during mechanical handling, designated hook points shall be provided to enable the cover sections to be removed. These points shall be identified with permanent notices

9.0 REFERENCES

- 9.1 The following documents have been referred to in the writing of this specification.
- 9.2 Preference will be given to the order in which the documents are listed.
- 9.3 Documents:
- A. Water Industry Mechanical and Electrical Specification 8.5 Issue 1 Odour Control Equipment Appendix G GRP Cover Specification.
 - B. British Water Code of Practice Fibre Reinforced Plastics for Use in Water and Effluent Treatment BW:COP:22.96
 - C. Loading for buildings. Code of practice for imposed roof loads BS 6399-3:1988 Parts 1 and 3.

D.

We reserve the right to alter or change this specification without prior notification.