

**PRODUCT
SPECIFICATION**

PS – 292**LIGHTWEIGHT POLYMERIC MH COVERS**

292.1 SCOPE

This specification nominates requirements for lightweight covers and frames made from polymeric materials used for maintenance holes, chambers, and shafts in light duty non-trafficable areas. Composite materials can also be used, including a combination of metallic and polymeric materials.

292.2 REQUIREMENTS

The covers and frames shall meet all design and performance requirements specified in AS 3996 for Class B load classification with the following amendments:

- (a) Have a maximum weight of 20 kg (per component);
- (b) Be manufactured from polymeric materials, including HDPE, PP, modified PP, and uPVC.
- (c) For polyolefin materials, they shall contain a UV stabiliser agent of at least 2.0% carbon black with a particle size range of 10-25 nanometre. For uPVC, they shall contain 2% rutile titanium dioxide. Where other polymeric materials are used appropriate evidence of the suitability of the material to resist ultraviolet radiation for a minimum 20 year life shall be provided. This should include service performance and accelerated testing data.
- (d) The covers shall be tested for impact resistance in accordance with AS/NZS 1462.3 at a temperature in the range 18 – 25 °C. The mass shall be 2.0 kg and the drop height shall be 2.0 metres. The test shall be conducted with the cover in the frame, simply supported on a flat surface. The impact location shall be located to be at the position of greatest distance between ribs, at the most vulnerable location in the cover. After 5 impacts at different positions, there shall be no cracking on either side of the cover, and the depth of indentation shall be no more than 5 mm.
- (e) The cover shall be secured to the frame by using two opposing M12 bolts made from stainless steel grade 304 or 316, or by other acceptable means;
- (f) The frame shall be secured to the structure's upper wall surface using recessed profile, dowel pins, or metal fixings, to prevent side movement.
- (g) Additionally, the requirements described in AS 3996 Section 3, Section 4 and Appendix C shall be modified as follows:
 - i. Add the following paragraph into Clause 3.2.2.1:

The skid resistance value shall be at least 35 in the wet condition when tested in accordance with AS/NZS 4586. Additionally the pattern design shall be evenly spread, allowing free draining, and covering a minimum of 10% of the total surface.

- ii. Add the following to points (a) and (b) of Clause 4.2.1.2:

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- c) One sustained application of the serviceability design load for 24 hours without exceeding the permanent set limit given in Table 4.2.
- d) One sustained application of the serviceability design load for 2 hours at a constant 50°C without exceeding the permanent set limit given in Table 4.2.
- iii. Replace 2nd paragraph of Clause 4.2.1.3 with:
Each batch release test sample shall sustain one resistance to sustained loading test (as detailed in (g) (ii) (c) above) without exceeding the permanent set limit given in Table 4.2.
- iv. Add the following to Clause C4.3:
 - d) Resistance to sustained loading at the serviceability design load for 24 hours at ambient.
 - e) Resistance to loading at the serviceability design load for 2 hours at a constant elevated temperature of 50°C
- v. Replace Clause C4.4 with:
The batch release test includes the following:
 - a) Resistance to sustained loading at the serviceability design load for 24 hours.
- vi. Add a new Clause C4.8:

Resistance to sustained loading

The procedure shall be as follows:

- a) Take an initial deflection reading at the geometric centre of the cover;
- b) Apply the load at a rate of between 1 and 5 kN/s up to the serviceability design load. Maintain the load on the specimen for 24 hours and then release. Take a second reading after letting the specimen rest for 1 hour.
- c) Determine the permanent set as the difference between the initial reading and the second reading.
- d) Carry out visual inspection for signs of cracking, collapse, or structural failure.

Note: the ambient temperature during the entire test shall be between 18°C and 25°C.

- vii. Add a new Clause C4.9:

Resistance to loading at elevated temperature

The procedure shall be as follows:

- a) Condition the specimen at 50°C for at least 4 hours.
- b) Take an initial deflection reading at the geometric centre of the cover.
- c) Apply the load at a rate of between 1 and 5 kN/s up to the serviceability design load. Maintain the load on the specimen for 2 hours at 50°C and then release. Take a second reading after letting the specimen rest for 1 hour at 50°C.

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- d) Determine the permanent set as the difference between the initial reading and the second reading.
- e) Carry out visual inspection for signs of cracking, collapse, or structural failure.

292.3 QUALITY ASSURANCE

- (a) Covers and frames shall be manufactured and supplied under cover of a certified ISO 9001 management system.
- (b) The manufacturer shall declare that only such products that conform to this specification will be supplied against orders quoting this specification and shall maintain production and test records supporting the declaration.

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