

Proof Load Testing per AASHTO M-306

The M-306 Standard

The American Association of State Highway and Transportation Officials (AASHTO) developed a standard, M-306, that calls for proof load testing of iron castings. For an H-20 proof load test, that standard requires a 40,000 lb. load to be applied to a 9" x 9" square plate for one minute. Any cracks or permanent deformation greater than 1/8" are cause for rejection.

Polymer Lids

In recent years, polymer lids have been used for a variety of applications, such as:

- Water meter pits & manholes, where existing cast iron lids blocked radio signals.
- Flow monitoring devices in manholes, where signals of rising levels are likewise blocked by cast iron lids.
- Theft, due to the scrap value of iron.
- In industrial and sanitary manholes to reduce finger and back injuries, due to their light weight.



How the M-306 Standard Relates to Polymer Lids

Municipalities and Engineers wanting a traffic rated polymer lid frequently specify an "H-20" rating in their specifications. There can be confusion since AASHTO published bridge design criteria, known as H-20, which calls for truck axle loading of 32,000 lbs., or 16,000 per wheel load. The AASHTO M-306 standard calls for a safety factor of 2.5 to be applied to the 16,000 lb. wheel load ($2.5 \times 16,000 = 40,000$ lbs.). Therefore, for H-20 rated lids, a 40,000 lb. proof load test is required. For H-25 rated lids, a 50,000 lb. proof load test is required.

Explanation of the Confusion

Many water departments began to install radio read meters but couldn't get a good read through cast iron lids. Frequently, many were only thinking of a radio-friendly material such as polymer, without giving much thought to its strength. As a result, many municipalities received thin plastic lids that could only withstand a proof load test of 5,000 lbs., or less. Frequently, breakage occurred from lawn tractors and other loads. To be conservative and have an industry standard they can specify, many municipalities require a 40,000 lb. proof load test, even where a lid is not in the roadway. Some suppliers advertise their lids as H-20, but are referring to a 16,000 lb. wheel load and not a 40,000 lb. proof load test. Some furnish lids that cannot even meet the 16,000 lb. load they advertise as "H-20".

How to Avoid the Confusion

To avoid confusion, your specs should require the proof load test you require, conducted per AASHTO M-306. To be safe, require a report from an independent test lab. Simply specifying "H-20" may not provide the safety factor you need, particularly where traffic loads are involved. The AASHTO M-306 standard requires the load to be placed at the center of the lid and not transfer any of the load directly to the frame. For smaller lids, such as 12" diameter, a plate smaller than 9" x 9" must be used. If you would like a proof load test performed on the lids you are using, contact Trumbull.