STP-27 NH₃ On-Board Weighing Systems - Product Test

REFERENCE
All sections of the Non Automatic Weighing Devices Specifications dealing with performance requirements as well as section 21 of the Specifications.

PURPOSE
This test may be performed on weighing systems mounted on a vehicle used to deliver Anhydrous Ammonia (NH₃).

EQUIPMENT
For the actual NH₃ Weighing System test, a suitable mass prover must be made available. To ensure that the mass prover is adequate for testing of the system, the following criteria must be met:

- the minimum graduation of the mass prover must be equal to or less than 1/5 of the limit of error (LOE) for the test load delivered from the Device Under Test (DUT).
- the capacity of the mass prover must be sufficient to ensure that a test load of greater than 500 times the minimum graduation (e) of the DUT may be measured.
- the mass prover must be considered acceptable by Measurement Canada for use as a piece of test equipment. Consult the Regional Gravimetric Specialist for more information.
- the mass prover must be calibrated and performing adequately. (Refer to the appropriate Mass Prover operators manual)
- The operator must be fully trained in use of the mass prover as well as handling of NH₃. (Refer to Measurement Canada’s Gravimetric Training for NH₃ Measuring Systems)

CONSIDERATIONS
This procedure may be used to perform initial or subsequent inspection of on board weighing systems.

The limit of error applies to the weight of the product delivered. For example: the DUT displays 4 000 kg before the delivery, and 1 000 kg after the delivery. The limit of error applies to the 3 000 kg delivered.

Systems using multichannel capabilities for linearity correction of off angle conditions must be tested at least once in all channels. The deadload should be checked to ensure it is the same for all applicable channels. An approximate check can be done by noting the indicated value at level, then cycle the device through its inclination range and all channels; all channels should display the same value as when at level.

Where the liquid line is not attached to the live portion of the device, ensure this line is charged prior to beginning testing as it may have lost product due to leakage when not in use.

Order of conducting tests is not critical, angle tests can be conducted first if practicable.

PROCEDURE USING A MASS PROVER

Level Testing
Place the DUT on a reasonably level surface and conduct the following tests:

-Visually inspect the DUT checking for deviations from approval, hoses plumbed incorrectly causing binding and additional items secured to the device that may effect its accuracy (i.e. Mud flaps and fenders must be secured to the frame of the vehicle, not the scale).
-Test load discrimination using test weights.
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- Prior to zeroing the Mass Prover, equalize the vapour pressure between the two vessels.
- Test blanking at capacity where possible.
- Transfer the first test load (5000e minimum) from DUT to the Mass Prover. Difference between indications of the Mass Prover and the DUT must not exceed the applicable LOE. LOE is based on indication obtained from the Mass prover.
- Where DUT is equipped with a ticket printing device, check for agreement between registrations and required information. Check that the printer is inhibited from printing when excessive motion is experienced.

Off Level Testing
- Visually inspect the device when conducting tests outlined below to ensure that any shifting that may have occurred due to inclination does not interfere with the devices' accuracy.
- Elevate the front or rear wheels of the DUT using supplied ramps or a ramp in the traders yard to one half of the maximum approved inclination specified in the NOA. Perform the tests described under "level testing" above, except the section and repeatability test.
- Elevate one rear wheel or tandem so the scale is at or near one half the maximum approved inclination value specified in the NOA. Perform the tests described under "level testing" above, except the section and repeatability test.
- Test blanking when maximum approved angle of inclination is exceeded.
- Test load discrimination with device at the lowest attainable weight.

INTERPRETATION OF RESULTS
The device meets the requirements if:

a) it provides a weight indication when off level up to at least 3 degrees, in any direction;
b) it performs within the prescribed limits of error when levelled and when off level by the larger of 3 degrees or the maximum angle at which it still provides a weight indication;
c) it blanks its indications and prevents the recording of weight values when it ceases to perform within limits of error.
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**MINIMUM TEST LOAD REQUIREMENTS**

<table>
<thead>
<tr>
<th>Graduation (e)</th>
<th>DUT (Class III)</th>
<th>LOE IS 500e&lt;m ≤ 2 000e</th>
<th>LOE ACC 500e&lt;m ≤ 2 000e</th>
<th>Graduation (e)</th>
<th>Test Load (Minimum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 kg</td>
<td>1.0 kg (10x)</td>
<td>0.5 kg (5x)</td>
<td>0.1 kg</td>
<td>&gt;250 kg</td>
<td></td>
</tr>
<tr>
<td>1.0 kg</td>
<td>2.0 kg (10x)</td>
<td>1.0 kg (5x)</td>
<td>0.2 kg</td>
<td>&gt;500 kg</td>
<td></td>
</tr>
<tr>
<td>2.0 kg</td>
<td>4.0 kg (8x)</td>
<td>2.0 kg (4x)¹</td>
<td>0.5 kg</td>
<td>&gt;1 000 kg</td>
<td></td>
</tr>
<tr>
<td>5.0 kg</td>
<td>10.0 kg (10x)</td>
<td>5.0 kg (5x)</td>
<td>1.0 kg</td>
<td>&gt;2 500 kg</td>
<td></td>
</tr>
</tbody>
</table>

This table may be used as a guideline for Class IIIHD devices as the applicable LOE is larger.

**REVISION**

Original document

¹ The Mass Prover selected in this case does not meet the 1/5 of the device LOE. Therefore, to conduct an initial inspection of this device, the test load size must be increased to more than 2 000 e (Class III), or a mass prover with smaller graduations used. Consult your regional gravimetric specialist for more information.