

TI-068 - Foam Concentrate Induction Rate Testing

The test procedure follows NFPA 11. Generally, it is recommended to use environmentally friendly foam concentrate substitutes, with the equivalent viscosity characteristics when testing proportioning components.

Preparation of the calibration curve

For determination of the induction rate at least three calibration solutions shall be prepared. It is important to use the foam concentrate and water as is used by the system. Otherwise the results will not be representative for the system.

- **Reference Solution 1 (A):** foam concentrate at its nominal concentration given by the manufacturer.
- **Reference Solution 2 (A+1 %):** foam concentrate at a concentration of 1 percentage point above the nominal concentration recommended by the manufacturer.
- **Reference Solution 3 (A-1% or A-30 %¹):** foam concentrate at a concentration of 1 percentage point below the nominal concentration recommended by the manufacturer.

Procedure:

1. Place ~90 % of the required amount of water in the volumetric measuring device (e.g. graduate cylinder of at least 100 ml or more), measure carefully the aliquot of the foam concentrate, add to the water and fill up with water to the end volume of solution (100 ml or more depending on the chosen measuring devices volume).



Note: when using high viscosity foam concentrates it may be better to mix the solution prior to filling it up to the final volume in order to reduce the risk of losing solution by the required vigorously stirring!

2. Mix the foam samples with the stainless-steel rudder.
3. Mark each sample with the percent solution it contains.
4. A refractive index reading should be taken from each foam solution sample.

¹ Foam concentrates with a recommended nominal induction ratio of $\leq 1\%$ v/v shall be inducted at 30 % less of the nominal induction ratio: For a 1 % foam concentrate the induction ratio would then be 0,7 %v/v, for a 0,5 % foam concentrate the induction ratio would be 0,35 % v/v.



Note: It is recommended to repeat at least two readings to make sure the measurement is ok.

5. Read carefully the manual of the refractometer and add a drop of the foam solution sample 1 onto the prism.
6. Follow the same procedure for samples 2 and 3.
7. Using the graph paper, plot the refractive index reading on one axis and the percent concentration readings on the other.
8. Connect the measured points on the graph paper. Ideally the result should be a straight line.

Testing the induction system

Start operating the induction system in normal operation mode and let it run for at least 60 sec to allow for equilibration.

Collect a foam solution sample from the induction system and repeat the Refractive Index Testing as described above. Care must be taken to ensure the sample is taken at a distance downstream from the proportioner adequate to give reproducibly homogeneous mixtures². Take refractive index readings of the sample and draw it into the plotted curve to read out the percentage.

Disclaimer

All information given in this technical information are based on our best knowledge at the time of this revision. This Technical Information remains subject to alterations and revisions. Please do not hesitate to contact us for the most recent edition.

² Particularly high viscosity foam concentrates may need some hose-/pipe-length after the proportioner to mix homogeneously with the water stream. This can be checked by testing several samples: If the obtained numbers are close – the mixture can be considered homogeneous. Larger spread of values indicates inhomogeneity.

Technical Information

Protocol Sheet

Test records

Date:
 Location:
 Type of system:

Inductor details

Induction percentage:
 Flow (l/min):
 Working pressure (bar):
 Temp. foam concentrate (°C):

Test result³:

Test solution

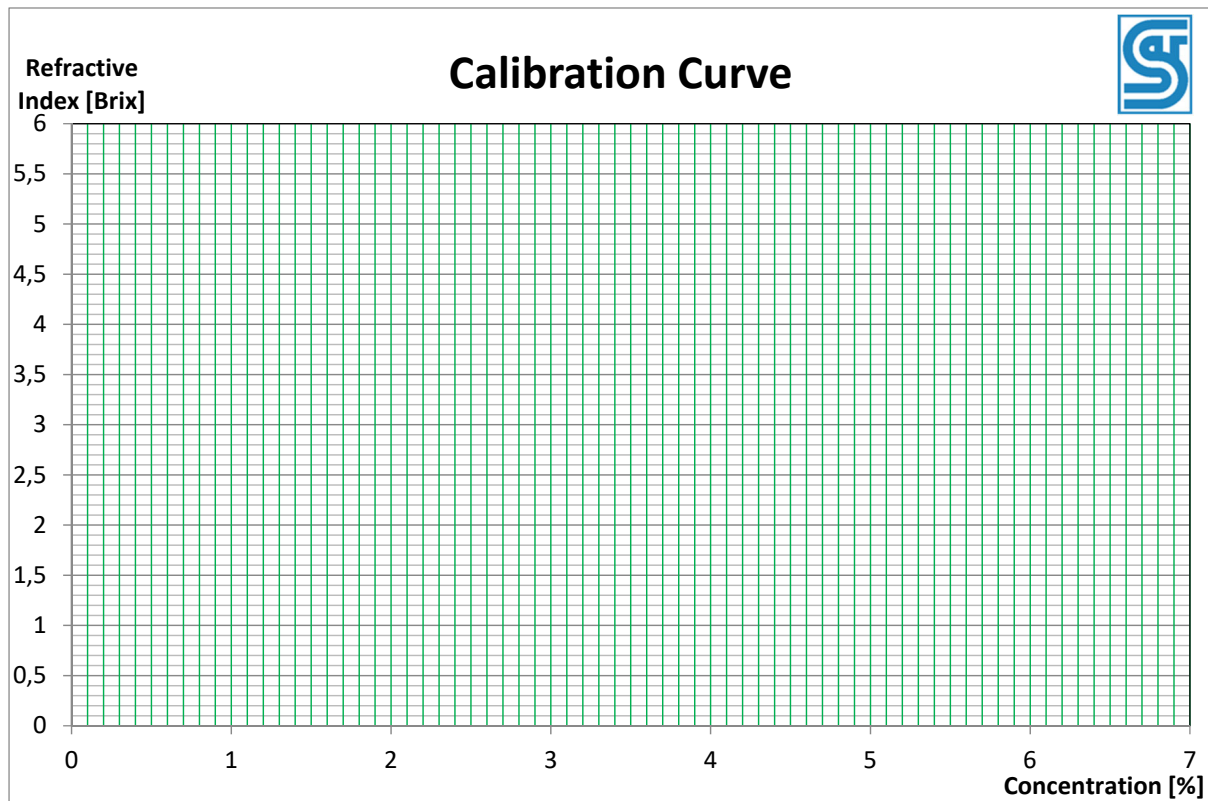
Reference solution 1: (A)
 Reference solution 2: (A+1 %)
 Reference solution 3: (A-1 %)

Measurement inductor

Measured refractive index_(inductor):
 Measured induction rate_(inductor): (%)
 Temp. system water (°C):

- Passed
 Not passed

Comments:



³The test is passed if the found induction ratio is between 100 % and 130 % of the set (nominal) induction ratio.

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