

Decision Rules

Concentrate Foam

Test Description	Method	Spec.limit	Typical Uncertainty measurement for results	Decision Rule
Appearance (Visual)	Visual	N/A, for information only	N/A	No set standard for what a foam should appear as and as such 'Appearance' is <i>for information only</i>. Draw attention to customer if the following physical appearance criteria are not met: i. There should be no visible signs of contamination ii. There should be little to no sediment and/or (phase) separation iii. The colour should be consistent throughout the sample
*Specific Gravity	ASTM D891 In-House	N/A, for information only	± 0.116 for Newtonian samples ± 0.472 for non-Newtonian samples	Report result to 3 d.p. There is no result specification specified on the ASTM D891-18 therefore result is for information only.
*pH	BS EN 1568 1-4	6.00 - 9.50	± 0.124	When results are added and subtracted from the expanded uncertainty; Pass: Result $\pm$ expanded uncertainty within limits, Fail: Result $\pm$ expanded uncertainty exceeds limits, Conditional Pass: Result $\pm$ expanded uncertainty within but overlaps limits, Conditional Fail: Result $\pm$ expanded uncertainty exceeds but overlaps limits

Surface Tension (mN/m)	ASTM D-971	N/A, for information only	±0.23 mN/m	Report result to 2 d.p. There is no result specification specified on ASTM D1331-20 therefore result is for information only.
*Sediment @ 20°C before ageing (%v/v)	BS EN 1568-1-4	≤ 0.25%	± 0.073	Report the % from centrifuge tube to 2dp, as < the spec limit or 'none'. If sediment is dispersible through a 180µm sieve, then record as 'yes' if not then 'no'. If recorded sediment value is > 0.25 or sediment cannot be dispersed through sieve, sample is recorded as unsatisfactory.
*Sediment @ 60°C after ageing (%v/v)	BS EN 1568-1-4	≤ 1.00%	± 0.073	As above. If recorded sediment value is > 1.00 or sediment cannot be dispersed through sieve, sample is recorded as unsatisfactory.
Viscosity (mPa.s.)	Viscosity	N/A, for information only	± 0.2 mPa.s	Report result to 2 d.p for non-Newtonian results and 4 significant figures for Newtonian results. There is no result specification therefore result is for information only.
Freeze Point (°C)	Freeze Point	N/A, for information only	± 0.68 °C	Report result to 1d.p. There is no result specification therefore report the value as it is.

25% Drainage Time	NFPA11	≥ 2 min 15 sec for AFFF foams ≥ 3 min 30 sec for Protein foams	± 53 seconds	Specification ranges are just a guideline. If result is out with the spec but meets the spec after taking the uncertainty of measurement into account, then we report the result as a pass and draw attention to the customer. If result is out with the spec after taking the uncertainty of measurement into account, then we report the result as a fail and draw attention to the customer.
Expansion Ratio	n.a	≥ 6.00	± 0.81	Report result to 2 d.p. Result is for information only.
Fire Extinguishment Performance Heptane (small scale test)	Based on FIA Guidance	$\frac{1}{2}$ pump – 2 pumps (i.e. 37.5 - 150.0 mL)	N/A	The quantity in “pumps” shall be recorded. If result is within the spec then report 'satisfactory'. If result is over 2 full pumps (i.e. > 150.0 mL) then report 'unsatisfactory'.
Fire Extinguishment Performance Acetone (small scale test)	Based on FIA Guidance	1 pump	N/A	The quantity in “pumps” shall be recorded. If result is 1 pump then report 'satisfactory'. If result is over 1 full pump then report 'unsatisfactory'.
Burnback	Based on FIA Guidance	fire destroys $\leq 50\%$ of the foam blanket after 5 minutes and 6 minutes	N/A	If the fire destroys $\leq 50\%$ of the foam blanket after 5 minutes and 6 minutes, it is recorded as a pass. If the fire destroys > 50% of the foam blanket at 5 minutes and 6 minutes, it is recorded as a failure. If the fire destroyed $\leq 50\%$ of the foam blanket at 5 minute and >50% at 6 minutes, it is recorded as a failure.

Testing carried out on sample at 20°C unless otherwise stated.

*UKAS testing

Produced Foam

Test Description	Method	Spec.limit	Typical Uncertainty measurement for results	Decision Rule
Appearance (Visual)	Visual	N/A, for information only	N/A	No set standard for what a foam should appear as and as such 'Appearance' is for information only. Draw attention to customer if the following physical appearance criteria are not met: i. There should be no visible signs of contamination ii. There should be little to no sediment and/or (phase) separation iii. The colour should be consistent throughout the sample
Sediment @ 20°C	In House	≤ 0.25%	± 0.20	Report result to 2 d.p. report results as 'None' for <0.25%, report as 'Traces' if there are only traces. If result is out with the spec but meets the spec after taking the un-certainty of measurement into account, then we report the result as a pass and draw attention to the customer. If result is out with the spec after taking the uncertainty of measurement into account, then we report the results as a fail
*Induction Percent (%v/v)	NFPA 11	1%: 1.0 - 1.3% 3%: 3.0 - 3.9% 6%: 6.0 - 7.0%	± 0.041	Report results to 1d.p. When results are added and subtracted from the expanded uncertainty; Pass: Result ± expanded uncertainty within limits, Fail: Result ± expanded uncertainty exceeds limits, Conditional Pass: Result ± expanded uncertainty within but overlaps limits, Conditional Fail: Result ± expanded uncertainty exceeds but overlaps limits

Testing carried out on sample at 20°C unless otherwise stated.

*UKAS testing

In the event that a critical test in above table is reported as a conditional Pass, Conditional Fail, or Fail, the entire sample will be reported as the worst possible outcome. For instance, if most tests passed, but a critical test such as pH received a Conditional Fail, the sample will be reported as a Conditional Fail as a result of pH.