

Foaming Tendencies of Engine Coolants in Glassware

ASTM D1881 – ASTM D7840



High temperature stability
Up to four positions per bath
Clamps and rack to hold cylinders
Bath drain
Robust

Item	Unit	Foaming Bath
P/N 230V/50-60Hz		00T0345
P/N 115V/60Hz		00T0346
Power 230V	[kW]	2.1
Power 115V	[kW]	1.7
Range	°C	Ambient ... 100
Outer bath material		Stainless steel cover, zincor powder coated case and borosilicate glass windows
Inner bath material		Borosilicate glass jar
Cylinders		1000 mL, borosilicate glass
Positions		4 openings per bath
L x W x H Bath	[mm]	380 x 430 x 710
L x W x H Rack	[mm]	300 x 430 x 520
Weight	[kg]	32
Bath volume	[L]	Up to 31
CE		Conforms to CE regulation
Heating	[kW]	2.8 (230V) 2.1 (115V)

General

ASTM D1881 covers the determination of the foaming characteristics of engine coolants under laboratory-controlled conditions of aeration and temperature. The test method generally will distinguish coolants that have a tendency to foam excessively from those that are suitable for further evaluation to determine performance in actual service. ASTM D7840 is the test method for foaming tendencies of non-aqueous engine coolants in glassware.

Construction

The Tamson D1881 apparatus consists of a visibility bath and a rack. The bath is used as a temperature bath. The bath is constructed with a glass jar with a diameter of 300 mm and a height of 450 mm. Around the jar is a zincor powder coated case equipped with two glass windows and a stainless steel cover. The bath has two cooling coils and has the capacity to hold up to four 500 ml graduated glass foam cylinders. The bath is equipped with RS232 communication port. Next to the bath, the apparatus is supplied with a rack to hold up to four foam cylinders. On this rack two flow meters are mounted and there is space for an optional dryer tower to be mounted on the same rack.

The rack also comes with a spill tray which can be removed for cleaning purposes. The Tamson D1881 foaming apparatus is standard supplied as shown in table 1 on the next page, suitable for two test positions in the bath. Two flow meters are included. Custom-made configurations are available on request.

Primary benefits of Tamson D1881 apparatus

- Up to four positions per bath
- Rack with clamps to overcome the buoyancy of the foam cylinders
- Stirrer with long shaft for optimal temperature uniformity
- Delrin stoppers instead of rubber stoppers, as rubber stoppers can crack over time
- Levelling feet to ensure the bath spirit is level
- Separate opening in cover to add bath medium to make sure the foaming cylinder is immersed to the 900 mL mark
- Robust zincor powder coated case around glass jar
- Removable outside window panels for cleaning purposes
- Bath is equipped with two cooling coils and can be used for ASTM D892 if needed
- Thermometer openings in cover
- Stainless steel cover and lids

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Accuracy

The Tamson foaming bath has a very high temperature stability, because it has a stirrer with a long shaft, resulting in better temperature uniformity inside the bath. The set point can be set in steps of 0.01°C (two decimals) in the range of 0°C up to 160°C (32..320°F). The readout is displayed in two decimals.

Temperature readout

Standard available in °C, on request in °F.

Safety

The bath conforms to CE regulation. It is further equipped with a mechanical resettable safety thermostat. A float is included and will indicate when the bath fluid is too low. The fumes from the test oil and the bath shall be vented in a manner compatible with local government regulations.

ASTM D892

Tamson also supplies an apparatus conform ASTM D892 (foaming characteristics at 24°C and 93.5°C). For an apparatus suitable for ASTM D892 and ASTM D6082, please see the ASTM D892 specification sheet.

Table 1: Apparatus ASTM D1881 P/N 00T0345 or P/N 00T0346 consists of the following parts:

P/N	Picture	Quantity	Description
00T0325		1	Tamson foaming bath, 230V/50-60Hz. Thermostatic bath with temperature range from ambient till 100°C. Equipped with float. Cover has four openings with clamps to insert four foam cylinders. Bath is equipped with a rack to hold the foam cylinders. Two additional openings are available for thermometers. Another opening can be used to add bath fluid. Bath is equipped with two cooling coils
00T0326			Tamson foaming bath, 115V/60Hz. Thermostatic bath with temperature range from ambient till 100°C. Equipped with float. Cover has four openings with clamps to insert four foam cylinders. Bath is equipped with a rack to hold the foam cylinders. Two additional openings are available for thermometers. Another opening can be used to add bath fluid. Bath is equipped with two cooling coils
31T0097		1	Stainless steel bracket to hold four foaming cylinders and four stoppers. The rack is delivered with two calibrated flowmeters and connectors, which can be mounted on the rack. Each flowmeter is delivered with a works certificate. Rack is including leakage tray. Also, the optional dryer tower can be mounted on the rack
09T0224		2	Foaming cylinder with NS45/50 joint, 500 ml, borosilicate glass, graduated
31T0160		2	Delrin stopper with O-rings for foam cylinder with opening for air inlet tube and a second opening for air outlet tubing. Stopper is including quick connectors and inlet tube
34T0000		1	Blue PU tubing 6 mm, 50 meter. Setup delivered with tube cutter (P/N 34T0005)

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Table 2: Required Accessories for ASTM D1881/D7840

Item	Picture	Suggested quantity	Description
31T0067		1	Wet test meter (volume measuring device), for accurate measuring of the gas volumes required by the test method
31T2060		1	Pump air compressor 230V/50-60Hz
On request			Pump air compressor 115V/60Hz
31T0068W		2	Norton Spherical Ceramic diffuser with works certificate for permeability and porrosivity

Table 3: Optional Accessories for ASTM D1881/D7840

Item	Picture	Suggested quantity	Description
31T2044		1	Gas drying tower, 75 mm x 289 mm, with 1/8" stainless steel NPT fittings and connectors to mount on D892/D6082 rack (P/N 31T0096)
31T0028		1	Digital stopwatch 1/100 second
25T0901B		1	Thermometer, solid stem, similar to ASTM 1 C, white backed, -20+150:1°C, capillary tube specially coated inside, with non-wetting blue special liquid, immersion 76mm, max.327x6-7mm, durable pigment, with Works Certificate at 0°C
31T0423		1	Cork for bath thermometer, pack of ten pieces

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Continued table 3: Optional Accessories for ASTM D1881/D7840			
Item	Picture	Suggested quantity	Description
00T0220		2	Bath fluid mineral oil T150, 20 litres transparent, 80..150°C
00T0911		1	Illuminator "Z41" backpanel (85 ~ 230V/50-60Hz)

Table 4: Consumables for five years of operation			
Item	Picture	Quantity	Description
09T0224		2	Foaming cylinder with NS45/50 joint, 500 ml, borosilicate glass, graduated.
24T0400		5	Upper O-ring 38 mm I.D. for stopper (P/N 31T0160)
24T0401		5	Lower O-ring 36 mm I.D for stopper (P/N 31T0160)
28T4163		2	Push-in fitting short, L-shaped, 6 mm O.D. for stopper (P/N 31T0160)
28T4507		2	Messing connector 6mm hose 1/8" for stopper (P/N 31T0160)
34T0048		3	Hose adapter 6mm O.D. to G1/4" quick fit
34T0061		2	Hose adapter T-shaped 6mm O.D. to G1/4" quick fit
31T2041		1	Refilling for dryer (P/N 31T2042), 5 lbs, 8 mesh