



PM Tamson Instruments

Tamson Products 2017

Content of presentation

- ✓ Tamson
- ✓ Key benefits
- ✓ Tamson product portfolio
 - ✓ ASTM equipment
 - ✓ Circulators / water baths
 - ✓ Accessories
 - ✓ Calibration baths
- ✓ New Product Development

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Tamson founded in 1878

- P.M. Tamson B.V. founded in 1878 by Mrs. Tamson in The Hague, The Netherlands.
- Distribution of laboratory supplies initially.
- From 1950s also manufacturing Tamson thermostatic baths and circulators.
- In 1992 sold to Fisher Scientific, USA.
- Fisher sold assets of manufacturing of Tamson Instruments in August 1998 – Fisher kept sales of general laboratory supplies.
- Assets were put in new company – Labovisco bv.
- In 2004 Labovisco is renamed in Tamson Instruments B.V.
- In 2008 moved to a new building in Bleiswijk.
- Since 2011 R&D of so-called 'ASTM Equipment' for Petroleum products

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Tamson Product Portfolio

- ✓ **ASTM Equipment for Petroleum Testing**
 - ✓ Viscosity Baths (ASTM D445, D2162, D2170, D2171)
 - ✓ Corrosion Baths (ASTM D445, D2162, D2170, D2171)
 - ✓ Density by Hydrometer (ASTM D1298, D287, D6822)
 - ✓ Water and Sediment (ASTM D1796, D4007, etc.)
 - ✓ Density by Pycnometer of Bitumen (ASTM D70)
 - ✓ Centrifuge for Sediment Tests (ASTM D91, D1796, etc)
 - ✓ Filter Blocking Tendency (ASTM D2068)
 - ✓ Ageing Bath Du Pont Testing (ASTM D6468)
 - ✓ Total Sediment in Residual Fuels (ASTM D4870)
 - ✓ Cold Soak Filterability Tests (ASTM D7501)
 - ✓ Sediment by Filtration of Crude Oil (D4807)
 - ✓ Manual adjustable Cloud and Pour Point (D97, D2500)
- ✓ **Circulators and water baths**
 - ✓ Heating
 - ✓ Cooling
- ✓ **Accessories**
 - ✓ Bath Fluids
 - ✓ Viscometer capillaries (ASTM D446, D2171), holders and vischchanger
 - ✓ 8-channel Stopwatch
 - ✓ ASTM Thermometers (ASTM E1) and holders
 - ✓ Digital Contact Thermometers for ASTM D445
 - ✓ Reference Standards (viscosity, TBN, TAN, flash point, distillation, CRM)
- ✓ **Calibration baths**

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ASTM Equipment Viscosity Baths

A few applications

Kinematic Viscosity

Thermometer calibration

Sensor calibration

Other examples:

- Chemical processes
- Density
- Reaction rate

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ASTM Equipment Viscosity Baths

The test method specifies a procedure for the determination of the kinematic viscosity of liquid petroleum products, both transparent and opaque, by measuring the time for a volume of liquid to flow under gravity through a calibrated glass capillary viscometer.

- ✓ ASTM D445: Kinematic Viscosity of Transparent and Opaque Liquids.
- ✓ ASTM D2162: Standard Practice for Basic Calibration of Master viscometers and Viscosity Oil (reference standards).
- ✓ ASTM D2170: Kinematic Viscosity of Asphalts.
- ✓ ASTM D2171: Viscosity of Asphalts by Vacuum Viscometers.

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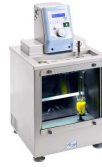
ASTM Equipment Viscosity Baths (ASTM D445) Tamson Viscosity TV2000 / TV4000 / TV4000DC / TV7000DC



Designed for ultra precise measurement:
Viscosity, calibration, crystal growing, density, reaction rate

- ✓ Stainless steel
- ✓ Ambient .. +230°C (+10°C with external cooler)
- ✓ 20, 40 or 70 L bath volume
- ✓ Stability ± 0.01°C (display also 0.01°C)
- ✓ RS232 + bath drain
- ✓ Large (double) windows
- ✓ Cooling coil + overflow outlet
- ✓ Two holes for separate ASTM reference thermometers
- ✓ Top lid for use with viscometer holders
- ✓ Fine adjustable offset
- ✓ Conform to ASTM D445 & D2170
- ✓ TV7000DC also conform to ASTM D2162
- ✓ LED Backlight (optional)
- ✓ Detachable window to clean windows of inner bath

ASTM Equipment Viscosity Baths (ASTM D445) Tamson Viscosity TV12

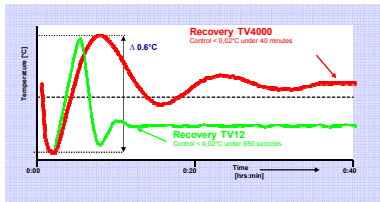


Designed for ultra precise measurement:
Viscosity, calibration of sensor sand thermometers, density, reaction rate, etc.

- ✓ Only 12 liter bath volume
- ✓ Stability: ± 0.005°C
- ✓ Small footprint: 32 x 34 cm
- ✓ Span +10°C .. +120°C (with external TLC10-3 through cooling coil)
- ✓ ASTM D445
- ✓ Display readout: 0.01°C
- ✓ Lid with 4 holes for viscometers
- ✓ Built-in illumination (LED)
- ✓ Detachable window to clean window of inner bath
- ✓ Stainless steel
- ✓ Holes for separate ASTM reference thermometers

ASTM Equipment Viscosity Baths (ASTM D445) Tamson Viscosity TV12

- Unique recovery time after temperature dip (caused by viscometers).
- Three times faster than conventional bath.
- This is strictly conform to ASTM D445.



ASTM Equipment Viscosity Baths (ASTM D445) Tamson Viscosity TV2500



Viscosity Measurement
Pulp and Polymer industry
Sensor Calibration
Bitumen
Density

- ✓ Stainless steel
- ✓ Stability ± 0.01°
- ✓ Ambient .. 120°C
- ✓ Four openings for viscometer holders
- ✓ Good visibility
- ✓ 25 L bath volume
- ✓ Cooling coil
- ✓ RS232
- ✓ Can be used for ASTM D1298 with special cover (P/N 03T2119) and 500 mL cylinders (P/N 09T0400)

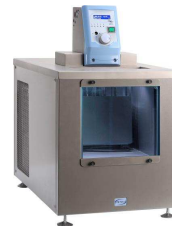
ASTM Equipment Viscosity Baths (ASTM D445) Tamson Viscosity TV2000AKV



Automated Kinematic Viscosity Measurement

- ✓ Stainless steel
- ✓ Stability ± 0.01°
- ✓ Ambient .. +120°C
- ✓ 20 L bath volume
- ✓ Measuring head for Ubbelohde and Cannon Fenske Routine viscometer
- ✓ System can store 25 viscometer constants
- ✓ Built-in timer
- ✓ Infra red detection
- ✓ Transparent / dark samples
- ✓ Fully ASTM D445
- ✓ Pulp and Polymer

ASTM Equipment Viscosity Baths (ASTM D445) Tamson Viscosity Low Temperature TV12LT




Designed:
Viscosity of jet fuel, calibration of thermometers and sensors,

- ✓ Only 15 liter bath volume.
- ✓ ASTM D445
- ✓ Display readout 0.01°C (0.001°C optional)
- ✓ Lid with four holes for viscometers
- ✓ Built-in illumination and built-in cooling
- ✓ Temperature range from -50°C up to +80°C.
- ✓ Detachable window to clean inside window
- ✓ Window heating
- ✓ Stainless steel, RS232
- ✓ Holes for separate ASTM reference thermometers
- ✓ Standard bath drain and overflow outlet

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ASTM Equipment Viscosity Baths (ASTM D445)

Tamson Viscosity Low Temperature TV4000LT / TV7000LT



- ✓ 40 ltr or 70 ltr bath
- ✓ Stability $\pm 0.02^{\circ}\text{C}$ (0.01 $^{\circ}\text{C}$ display)
- ✓ RS232
- ✓ -40°C .. $+100^{\circ}\text{C}$
- ✓ Top lid for use with viscometer holders
- ✓ Fine adjustable offset
- ✓ Fully ASTM D445
- ✓ Excellent homogeneity
- ✓ Energy saving
- ✓ Window heating
- ✓ Can be used with SI Analytics AVS
- ✓ Standard bath drain


Designed for ultra precise measurement at low temperature:
Viscosity of jet fuel, calibration of thermometers and sensors.

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ASTM Equipment Viscosity Baths (ASTM D445)

Tamson Low Temperature Viscosity TLV25



- ✓ 25 ltrs bath
- ✓ Stability $\pm 0.04^{\circ}\text{C}$
- ✓ Top lid for use with 3 viscometer holders
- ✓ Complies to ASTM D445
- ✓ Window heating
- ✓ Built-in illumination


- Designed for viscosity measurement at low temperature
- Operates down to -80°C
- Needs an external cooler like the KV80

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ASTM Equipment Viscosity Baths (ASTM D445)

Tamson Low Temperature Viscosity TLV25



- ✓ TIC80 probe -80°C
- ✓ 2.5 m flexible hose
- ✓ Compact immersion probe 50 x 200 mm
- ✓ Easy operation


- The probe can be immersed directly in a fluid
- Applies heat removal on a spot
- Can be used together with the TLV25.

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ASTM Equipment Viscosity Baths (ASTM D2171)

Tamson Vacuum System to measure Viscosity of Asphalts (Bitumen)



Digital Vacuum pump provides constant vacuum

- ✓ 0 .. 320 mm Hg
- ✓ High accuracy ± 0.5 mm Hg
- ✓ ASTM D2171 standard test for viscosity of asphalt by vacuum capillary viscometer
- ✓ Can be offered with every manual viscometer bath
- ✓ Wide range input 85 .. 250V 50-60Hz

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ASTM Equipment Viscosity Baths (ASTM D2162)

Calibration of Master Viscometers

(also calibration of long thermometers and temperature sensors)



- ✓ Ultra stable $\pm 0.005^{\circ}\text{C}$
- ✓ Integrated cooling
- ✓ Stainless steel bath
- ✓ Heated windows
- ✓ RS232 communication
- ✓ 0.001 $^{\circ}\text{C}$ readout
- ✓ Range from $+10^{\circ}\text{C}$ up to $+60^{\circ}\text{C}$
- ✓ Master viscometer + holders available
- ✓ Holders + leveling platform for thermometers available.
- ✓ This bath is unique in the world
- ✓ Product for National Metrological Institutions

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ASTM Equipment Viscosity Baths (ASTM D2162)

Calibration of Master Viscometers

(Alternative TV7000DC and TLC15 or TLC40)



- ✓ Ultra stable $\pm 0.005^{\circ}\text{C}$ (range from $+30^{\circ}\text{C}$ to $+230^{\circ}\text{C}$)
- ✓ With external cooler TLC15 range from $+15^{\circ}\text{C}$ to $+230^{\circ}\text{C}$ (long cool down time, extremely good stability).
- ✓ With external cooler TLC40 range from $+5^{\circ}\text{C}$ to $+230^{\circ}\text{C}$ (fast cool down, stability $\pm 0.015^{\circ}\text{C}$)
- ✓ RS232 communication
- ✓ 0.01 $^{\circ}\text{C}$ readout
- ✓ Master viscometers + holders available

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ASTM Equipment Corrosion Baths

This test method covers the determination of the corrosiveness to copper or silver of petroleum products or other hydrocarbons.

- ✓ ASTM D130: Corrosiveness to Copper from Petroleum Products by Copper Strip Test
- ✓ ASTM D849: Copper Strip Corrosion by Industrial Aromatic Hydrocarbons
- ✓ ASTM D7671: Corrosiveness to Silver by Automotive Spark-Ignition Engine Fuel-Silver Strip Method
- ✓ ASTM D1838: Copper Strip Corrosion by Liquefied Petroleum Gases (LPG)

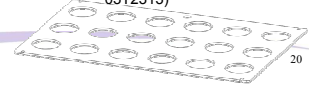


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ASTM Equipment Corrosion Baths (ASTM D130, D4048, D7095) Copper Corrosion of Petroleum Products



- ✓ Range from +5°C .. +250°C
- ✓ Standard drain
- ✓ Six positions
- ✓ Holders for test pressure cylinder
- ✓ Holders for test tubes
- ✓ All necessary accessories are supplied by Tamson.
- ✓ Can also be used as circulator
- ✓ Nine positions optional (P/N 03T2311)
- ✓ 18 positions with TC40 (P/N cover 03T2313)



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ASTM Equipment Corrosion Baths (ASTM D849) Corrosion by Industrial Aromatic Hydrocarbons

Corrosion by Industrial Aromatic Hydrocarbons



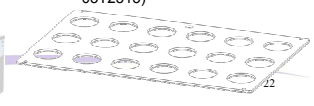
- ✓ Range from +5°C .. +250°C.
- ✓ Standard drain and cooling coil.
- ✓ Can also be used as circulator.
- ✓ Complete set-up P/N 00T2015 (230V) or P/N 00T2016 (115V) is delivered with:
 - ✓ TC40 bath
 - ✓ Levelling platform.
 - ✓ Six sets of glassware (flask P/N 31T2012 + condenser P/N 31T2011).
 - ✓ Two boss heads and six clamps to keep glassware in upright position.

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ASTM Equipment Corrosion Baths D4814, D7667, D7671, IP 227, and IP 611 Silver Corrosion of Petroleum Products



- ✓ Range from +5°C .. 250°C
- ✓ Standard drain
- ✓ Six positions standard
- ✓ All necessary accessories for above mentioned methods are supplied by Tamson.
- ✓ Can also be used as circulator
- ✓ Nine positions optional (P/N 03T2311)
- ✓ 18 positions with TC40 (P/N cover 03T2313)



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ASTM Equipment Corrosion Baths D1838 Copper Corrosion of LPG



- ✓ Range ambient .. 80°C
- ✓ Up to four positions
- ✓ Cover with holders for test cylinder
- ✓ Holes in cover, to check for LPG leakage
- ✓ Standard drain & overflow outlet
- ✓ Designed to work at 37.8°C without an external chiller
- ✓ All necessary accessories are supplied by Tamson.



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ASTM Equipment Density by Hydrometer

This test method covers the laboratory determination using a glass hydrometer of the density, relative density, or API gravity of crude petroleum, petroleum products, or mixtures of petroleum and nonpetroleum products normally handled as liquids.



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ASTM Equipment Density by Hydrometer (ASTM D1298, D287, D6822) D1298 set-up



- ✓ Solid/firm rack
- ✓ Clear view on hydrometer
- ✓ Easy cleaning & drainage
- ✓ High quality glass
- ✓ Leakage tray
- ✓ Double wall cylinders
- ✓ Cooling circulator
- ✓ Range from +5°C .. +120°C
- ✓ Additional tripod can be used, to get a six position apparatus.
- ✓ Especially for crude oil

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ASTM Equipment Density by Hydrometer (ASTM D1298, D287, D6822) Alternative TV2500




- ✓ When customer is always testing above ambient temperature, e.g. @ 40°C or 100°C.
- ✓ Range from ambient up to 120°C.
- ✓ Can be used with three hydrometer cylinders (P/N 09T0400). Part number for cover with three * Ø 61 mm openings is 03T2119.
- ✓ Advantage of the TV2500 is that the bath can also be used for kinematic viscosity measurements conforming to ASTM D445.

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ASTM Equipment Density by Hydrometer (ASTM D1298, D287, D6822) Alternative TV2500 + TLC15




- ✓ Same set-up as in previous sheet.
- ✓ Additional TLC15-5 cooling circulator which can be connected to the cooling coil of the TV2500.
- ✓ Due to TLC15-5 the range for density measurements will be from +5°C up to 120°C.
- ✓ Set-up can be used for kinematic viscosity & density measurements.

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ASTM Equipment Density by Pycnometer


This test method covers the determination of the relative density and density of semi-solid bituminous materials, asphalt cements, and soft tar pitches by use of a pycnometer.



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ASTM Equipment Density by Pycnometer (ASTM D70, IP 189)



- ✓ Test is @ 15.6°C or @ 25.0°C.
- ✓ TC16 set-up for pycnometers
- ✓ Suitable for Hubbard and/or Gay-Lussac pycnometers
- ✓ Optional TLC15-5 to work below ambient temperature


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ASTM Equipment Carbonizable Substances

The ASTM D565 (mineral oil) and ASTM D612 (paraffin wax) test methods cover the determination whether the sample conforms to the standard quality required for pharmaceutical use

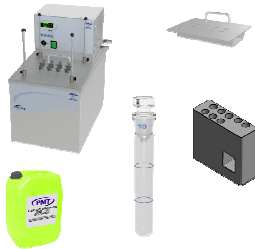
For the test, either mineral oil or melted wax is treated with concentrated sulfuric acid (H₂SO₄) and heated under prescribed conditions. The resulting colour is compared with a reference standard to determine whether it passes or fails the test.



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ASTM Equipment Density by Pycnometer (ASTM D525 – ASTM D612)



- ✓ TC16 is needed with leveling platform (P/N 07T0210) and cover with eight holes (P/N 03T2314).
- ✓ Test tube (P/N 09T0230) for ASTM D565/D612. Stopper is included. Test tube is delivered with rolled edge.
- ✓ Colour comparator (P/N 31T0040).
- ✓ Silicon oil (20L) (P/N 08T0001).


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ASTM Centrifuge for Oils

Centrifuges in oil labs are used for several applications:

- ✓ ASTM D91: Precipitation of lubricating oils.
- ✓ ASTM D96, D1290, D1796, D2273, D2709, D4007: Water and Sediment tests.
- ✓ ASTM D893: Insolubles in used lubricating oils.
- ✓ ASTM D2711: Demulsibility characteristics of lubricating oils.




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ASTM Centrifuge

(ASTM D91, ASTM D96, D893, D1290, ASTM D1796, ASTM D2273, API 2548 (DIN 51 793, IP 75), ASTM D2709, D2711, ASTM D4007, IP 359)



- ✓ User friendliness
- ✓ TFT touch screen: easy to read and values selection
- ✓ Informative display about the progress of stages of centrifugation
- ✓ Rotor and adapters list on memory
- ✓ Real values on screen of RCF based on accessories configuration
- ✓ Timer count up/down, for 0 or at "set RPM/RCF" for test reproducibility. From 0 to 60 minutes, in one minute steps, and hold position
- ✓ Up to 175 acceleration ramps and up to 175 braking ramps
- ✓ Automatic rotor recognition
- ✓ Lid latch lock
- ✓ Option: gas release system


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ASTM Equipment Water & Sediment

(ASTM D91, ASTM D96, ASTM D1796, ASTM D2273, ASTM D4007, IP 359)

Water bath to preheat the centrifuge cones




- ✓ Range from +5°C. +250°C
- ✓ Nine positions
- ✓ Standard drain
- ✓ With the levelling platform you can immerse the centrifuge cones in the vertical position **exactly** to the 100-mL mark as written in the methods!!
- ✓ Can also be used as circulator

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ASTM Equipment Filter Blocking Tendency (ASTM D2068 / IP387)


A test portion of the fuel to be analysed is passed at a constant rate of flow (20 mL/min) through a specified filter medium. The pressure difference across the filter, and the volume of fuel passing the filter, are monitored until the pressure reaches 105 kPa or the volume of fuel passing the filter medium reaches 300 mL. The pressure and flow are then used to calculate the filter blocking tendency, where a low number indicates a good fuel.



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ASTM Equipment Filter Blocking Tendency (ASTM D2068 / IP387) TFBT



- ✓ Procedures A & B
- ✓ Integrated touchscreen:
 - Real time curve is shown
 - Visually guided test using step by step instruction graphs
 - Can be used to select the right test, setting parameters and calibration of the sensors, easy to operate
- ✓ Integrated printer
- ✓ Single voltage from 85-230V, 50-60Hz.
- ✓ Fully electronic calibration. No use of screwdrivers to adjust knobs
- ✓ Service Screen to check all sensors
- ✓ Password protected service screen for calibration data
- ✓ Password protected service screen for test parameters
- ✓ One guest and seven password protected pre-set users
- ✓ Resolution of temperature, pressure and volume:
 - ✓ Temperature ± 0.05°C
 - ✓ Pressure Non Linearity = 0.5%
 - ✓ Volume ± 0.2 mL
- ✓ Easy to calibrate flow, volume, and pressure, and temperature (IEC 751)

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ASTM Equipment Ageing Bath (ASTM D6468, Dupont F21, Octel F31)

Two 50 mL volumes of filtered middle distillate fuel are aged for 90 or 180 min at 150°C in open tubes with air exposure. After aging and cooling, the fuel samples are filtered and the average amount of filterable insolubles is estimated by measuring the light reflectance of the filter pads. The 100 and 0 % extremes of the reflectance rating range are defined by an unused filter pad and a commercial black standard, respectively.



ASTM Equipment Ageing Bath (ASTM D6468, Dupont F21, Octel F31) TC16 or TC40 oil baths for aging middle distillate fuels



- ✓ Range from +5°C .. +250°C
- ✓ TC16 with cover for six positions
 - ✓ Optional for nine positions
- ✓ TC40 with cover for 18 positions
- ✓ Test tube holder for test tube (25*200mm), P/N 14T0103
- ✓ Standard drain
- ✓ Can also be used as circulator
- ✓ One can of silicon oil (P/N 08T0001) needed as the test is @ 150°C.

ASTM Equipment Sediment in Crude Oil by Membrane Filtration (ASTM D4807)

A portion of a representative crude oil sample is dissolved in hot toluene and filtered under vacuum through a 0.45-µm porosity membrane filter. The filter with residue is washed, dried, and weighed to give the final result.



ASTM Equipment Sediment in Crude Oil by Membrane Filtration (ASTM D4807)



- ✓ TC16 circulator pumps bath content through the jacketed funnel to keep the sample (mixture of toluene and crude oil) at +90°C
- ✓ Funnel and filter support are made from glass as per method
- ✓ 1000 mL Erlenmeyer (optional 500 mL or 1000 mL)
- ✓ One can of silicon oil (P/N 08T0001) as the test is @ 90°C.
- ✓ All necessary accessories (clamp, stopper, support, vacuum pump, filters, tuning are included in apparatus)
- ✓ Other acc. like oven, balance, desiccator are optional)

ASTM Equipment Total Sediment in Residual Oils (ASTM D4870, IP 375, ISO 10307)

A weighed quantity (10 g) of the oil sample is filtered through the prescribed apparatus at 100°C. After solvent washing and drying the total sediment on the filter medium is weighed. The test is to be carried out in duplicate. In the appendix two procedures are described for evaluating the sediment forming tendency of residual fuel oils during storage.



ASTM Equipment Total Sediment (ASTM D4870, IP 375, ISO 10307) Ageing baths TC16 or TC40



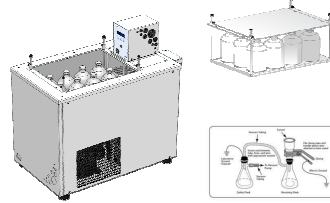
- ✓ Range from +5°C ..+250°C
- ✓ TC16 with cover for six positions
- ✓ TC40 with cover for fifteen positions
- ✓ Air wells
- ✓ Standard drain
- ✓ Silicon oil (P/N 08T0001) as the test is @ 100°C.

ASTM Equipment Cold Soak Filtration Test of Biodiesel (ASTM D7501)

In this test method, 300 mL of biodiesel (B100) is stored at $4.5 \pm 0.5^\circ\text{C}$ ($40 \pm 1^\circ\text{F}$) for 16 h, allowed to warm to $25 \pm 1^\circ\text{C}$ ($77 \pm 2^\circ\text{F}$), and vacuum filtered through a single $0.7 \mu\text{m}$ glass fiber filter at controlled vacuum levels of $\sim 70\text{--}85 \text{ kPa}$ ($21\text{--}25 \text{ in. of Hg}$). To pass, the full 300 ml sample must flow through the filter in less than 360 seconds.



ASTM Equipment Cold Soak Filtration Test of Biodiesel (ASTM D7501) TLB50 + Filtration Kit



- ✓ TLB50 to keep samples at $+4.5^\circ\text{C}$ for 16 hours
- ✓ Position for 12 x 500mL Jars
- ✓ Smart rack to position flasks
- ✓ Complete filtration set
- ✓ Vacuum pump
- ✓ Alternative TFBT as per ASTM D2068/IP387

ASTM Equipment Cold Flow Properties

ASTM D97: Pour Point of Petroleum Products. The pour point describes a procedure for testing the fluidity of a petroleum product at a temperature.

ASTM D2500: Cloud Point of Petroleum Products. The cloud point is defined as the temperature of a liquid specimen when the smallest observable cluster of wax crystals first appears upon cooling.



ASTM Equipment Cold Flow Properties Single and adjustable circulator baths TLC40 and TLC80



- ✓ Stainless steel
- ✓ Manual PP and CP
- ✓ -40°C with TLC40-14
- ✓ -80°C with TLC80-14
- ✓ Stability $\pm 0.05^\circ$
- ✓ Bath drain, Level detection
- ✓ Lid with position for six jackets
- ✓ All accessories like felt disks, felt gaskets, corks, jackets, test jars are supplied by Tamson

Heating Circulators Applications



Preheating of samples



Thermometer calibration



Sensor calibration




Experiments

Heating Apparatus and Application (High Temperature)

- ✓ Tamson Bracket (TB)
- ✓ Tamson Thermostat Units (TTU-A)
- ✓ Tamson Bath (TBxx)
- ✓ Tamson Circulator (TCxx)

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Tamson Bracket (TB)



- ✓ Completely stainless steel
- ✓ Width can be adjusted from 186-422 mm
- ✓ Auto tuning, high precision
- ✓ Heater 1100W
- ✓ Pump 7 L/min
- ✓ Easy to operate
- ✓ Fluid level detection
- ✓ Cooling coil*
- ✓ Heater 1600W*
- ✓ RS232 Communication
- ✓ Remote PT100*
- ✓ *Optional


Applications:

- To replace old thermostatic units
- Heating of custom made bath which already is being used by the customer.

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Tamson Thermostat Unit (TTU-A)



- ✓ Completely stainless steel
- ✓ Ambient to 200°C
- ✓ Easy to operate
- ✓ Fluid level detection
- ✓ RS232 Communication
- ✓ Custom made mounting plates available
- ✓ Several TTUA models:
 - ✓ Stirrer, boost heater, long shaft
 - ✓ Stirrer, cooling coil, long shaft
 - ✓ Pump and stirrer, short shaft
 - ✓ Stirrer, boost heater, short shaft

Applications:


- To replace old thermostatic units
- Heating of custom made bath which already is being used by the customer.

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Tamson Bath (TBXX)

TB30



- ✓ Bath stainless steel
- ✓ 30 ltr
- ✓ ambient .. 120°C
- ✓ Level indication
- ✓ Bath drain
- ✓ Cooling coil
- ✓ RS232
- ✓ Levelling platform for one model

Applications:


- Quality testing
- General purpose
- Thermometer calibration

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Tamson Circulator TCxxb

TC6b, TC10b, TC20b



- ✓ Bath stainless steel
- ✓ 6, 10 or 20 ltrs
- ✓ Range ambient .. 200°C
- ✓ Level indication
- ✓ Bath drain
- ✓ Cooling coil
- ✓ Levelling platform*
- ✓ RS232*
- ✓ Remote PT100*
- ✓ *Optional

Applications:

- Quality testing
- General purpose
- Heating of external device

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Tamson Circulators TCxxb

- ✓ **TC6b, TC10b and TC20b can be used as:**
 - Circulator through external circulation
 - Water baths for all kind of applications



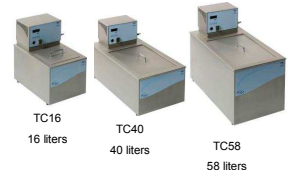
Very strong levelling platform anchored in the four corners of the bath.

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Tamson Circulator TCxx

TC16, TC40, and TC58



- ✓ Bath stainless steel
- ✓ Cooling coil
- ✓ Precise control
- ✓ Temperature range from ambient up to 250°C
- ✓ Pump 7.5 L/min
- ✓ Auto tune, high precision
- ✓ Display readout in 0.1°C (controller has an accuracy of 0.01°C)

Applications:

- Heavy duty
- Quality testing
- Large volumes
- High temperatures


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Tamson Circulator TC16

16 liters bath

Can be used as a circulator and water bath.



Options:

- ✓ RS232 communication (readout of 0.01°C with free TamCom software).
- ✓ Remote PT100
- ✓ Additional heater 1500W
- ✓ Pressure/suction pump
- ✓ Performance pump 16 L/min
- ✓ Levelling platform
- ✓ Top lid with lid of 9 rings

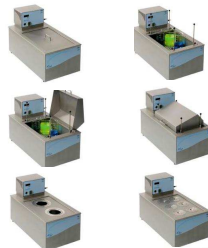
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PM Tamson Instruments

Tamson Circulators TC40/TC58

40/58 liters bath

Can be used as a circulator and water bath.



Options

- ✓ RS232 communication (readout of 0.01°C with free Tamson software).
- ✓ Remote PT-100
- ✓ Pressure / suction pump
- ✓ Performance pump 16 L/min
- ✓ Levelling platform + lid
- ✓ Gabled lid (so no condensation in samples)
- ✓ Top lid with cover of 2 sets of 9 rings
- ✓ Top lid with cover of 6 sets of 6 rings


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PM Tamson Instruments

Heat removal circulators

(Low temperature)

TLB50, TLC10, TLC15, TLC30, TLC40, TLC80, TLC80-DP, and TLC90.




- ✓ Ambient .. -90°C
- ✓ RS232 communication
- ✓ External circulation
- ✓ Bath
 - ✓ Drain
 - ✓ Level indication

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PM Tamson Instruments

Heat removal

(A few applications)



Flash Point (Abel)

Cold Filter Plugging Point

General Laboratory

- Experiments
- Refractometers
- Rotary Evaporators
- Etc.

Viscosity

Cloud & Pour Point

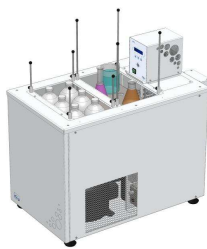
Cooling of waterbaths

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PM Tamson Instruments

Tamson Low temperature Bath TLB50

For preconditioning samples before running an ASTM test



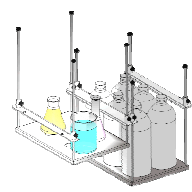
- ✓ Range from -5°C up to +80°C.
- ✓ Energy efficient
- ✓ Fixed or split leveling platform
- ✓ Adjustable rack systems.
- ✓ Multiple safety features
 - ✓ Bath drain and overflow
 - ✓ Over-temperature
 - ✓ Acoustic alarm (high/low)
 - ✓ Warning to your laboratory alarm system
- ✓ Table top
- ✓ Rapid cool down
- ✓ Stability ± 0.02°C

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Tamson Low temperature Bath TLB50

For preconditioning samples before running an ASTM test




- ✓ Precool samples or preheat samples (a few mL to 1 L bottles)
- ✓ Multiple preparation applications:
 - ✓ RVP test is 0 to 1°C or 32-34°F
 - ✓ Long term storage of Gas is <10°C (50F) or <20°C (68F).
 - ✓ D86 charge is 55°F to 65°F or 12°C to 18°C (approximate)
- ✓ Bitumen samples for penetration
- ✓ Biodiesel samples

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PMI PM Tamson Instruments

Tamson Low-temperature Circulator

TLC103



- ✓ Stainless steel
- ✓ -10°C...+60°C
- ✓ Optional -10°C...+120°C
- ✓ Stability better than $\pm 0.05^\circ\text{C}$
- ✓ Bath drain
- ✓ Level detection
- ✓ RS232, free software
- ✓ Pump 7 L/min
- ✓ Bath volume 3 L
- ✓ Opening 40 x 120 mm
- ✓ Depth bath 150 mm
- ✓ Excellent price value ratio


- Reliable
- Small footprint
- Auxiliary temperature control
- Rapid cooling down
- Very quiet
- Precise control
- Cooling of refractometers, thermostatic baths, viscometer baths, flash point testers, distillation units, etc.

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PMI PM Tamson Instruments

Tamson Low-temperature Circulator

TLC15.5, TLC30.5



- ✓ Stainless steel
- ✓ -15°C...+60°C, $< -30^\circ\text{C}$...+60°C
- ✓ Optional -15°C/30°C...+120°C
- ✓ Stability $\pm 0.05^\circ\text{C}$
- ✓ Bath drain
- ✓ Level detection
- ✓ RS232, free software
- ✓ Can be used as small bath
- ✓ Bath volume 5 L
- ✓ Opening 85 x 150 mm
- ✓ Depth bath 150 mm
- ✓ Pump 7 L/min


- Reliable
- Small footprint
- Very quiet
- Precise control
- Auxiliary temperature control
- Rapid cooling down
- Cooling of refractometers, thermostatic baths, viscometer baths, flash point testers, distillation units, etc.

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PMI PM Tamson Instruments

Tamson Low-temperature Circulator

TLC40.14, TLC80.14, TLC90.14



- ✓ Stainless steel
- ✓ 40°C, -80°C, -90°C ... Ambient.
- ✓ Stability $\pm 0.05^\circ$
- ✓ Bath drain
- ✓ Level detection
- ✓ Bath volume 14 L
- ✓ Opening 240 x 160 mm
- ✓ Depth bath 150 mm
- ✓ Pump 7 L/min
- ✓ RS232*
- ✓ Suction / pressure pump*
- ✓ Performance pump 16 L/min, max 1 bar*
- ✓ Optional*


- Bath or circulation
- Replace tap water.
- High C&P (D97) (TLC40)
- C&P(D97), CFPP (TLC80, TLC90)
- Flash point (Abel, IP170) TLC40
- Connect multiple lab equipment
- Distillation

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PMI PM Tamson Instruments

Tamson Low-temperature Circulator

TLC80.14DP



- ✓ Stainless steel
- ✓ -80°C... Ambient
- ✓ Stability $\pm 0.05^\circ$
- ✓ Bath drain
- ✓ Level detection
- ✓ Bath volume 14 L
- ✓ Opening 240 x 160 mm
- ✓ Depth bath 150 mm
- ✓ Pump 10 L/min
- ✓ Economical mode
- ✓ RS232*
- ✓ Suction / pressure pump*
- ✓ Performance pump 16 L/min, max 1 bar*
- ✓ Optional*
- Heat removal 300W @ -80°C


- Bath or circulation.
- C&P(D97), CFPP
- Connect multiple lab equipment with only one cooler
- Practical use -80°C ... -40°C

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PMI PM Tamson Instruments

Accessories


- ✓ Bath fluid
- ✓ Viscosity accessories
- ✓ 8-Channel Stopwatch
- ✓ Backlight illumination
- ✓ ASTM Thermometers
- ✓ Digital Contact Thermometer
- ✓ Reference Standards



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Bath Fluid




- ✓ Mineral oil
 - ✓ (range +80°C ... +150°C)
- ✓ Silicon oil transparent
 - ✓ (range +20°C ... +150°C)
 - ✓ (range +80°C ... +150°C)
 - ✓ (range +80°C ... +250°C)
- ✓ Silicon oil opaque
 - ✓ Range +80°C ... +250°C
- ✓ Important viscosity ≤ 10 cSt

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Viscosity Accessories




- ✓ Viscometers
 - ✓ ASTM D446
 - ✓ ASTM D2171
 - ✓ ASTM D2162
 - ✓ Standard Calibration Certificate
 - ✓ Optional ISO 17025 certificate*
- ✓ Stainless steel viscometer holders

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Viscosity Accessories




- ✓ Viscochanger (seven position)
- ✓ Timer (eight positions)
- ✓ LED Z41 Backlight

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Viscosity Accessories

Backlight Illumination
LED Panel for TV4000 and TV2000



- ✓ Led panel
- ✓ Better light than old Z41 with bulb light
- ✓ Suitable for 85 .. 250 mains voltage
- ✓ Saves important work bench space
- ✓ Clear light
- ✓ Can easily be mounted on TV4000 and TV2000.

To be used when measurements have to be followed visually!!

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Viscosity Accessories

Tamson Manifold for Kinematic Viscosity (TMKV)
Manifold for TV4000




- ✓ Ideal tool for kinematic viscosity measurements
- ✓ Equipped with fluid trap and adjustable vacuum valve
- ✓ No need to use pipette balloons anymore
- ✓ Can easily be mounted on TV4000

To be used for kinematic viscosity measurements

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PM Tamson Instruments

ASTM Thermometers




- These thermometers comply with the ASTM E1.
- The glass thermometers are suitable for official calibration.
- To protect the thermometer for mechanical damage a stainless steel holder can be supplied
- From October 2017 Hg liquid in glass thermometers will be forbidden to ship with the European Union.

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PM Tamson Instruments

Thermometer E20 / DCT ASTM D445




- ✓ 2 or 3 decimal places
- ✓ Stand alone
- ✓ Different ranges
- ✓ Full ASTM D445 – E20
- ✓ Readout on LCD
- ✓ Six points calibration

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Viscosity Calibration Standards

To be used as a reference standard for viscosity measurements!



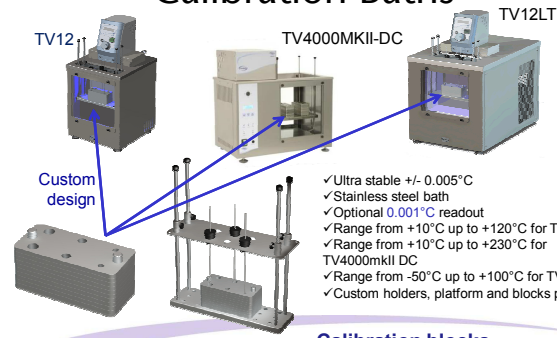
- ✓ Primary standard
- ✓ Conforms to ASTM D2162
- ✓ ISO 17025 certified under UKAS
- ✓ Values certified 20, 25, 40, 50 and 100°C
- ✓ Up to two years shelf life
- ✓ 0.5 liter bottles
- ✓ Other ASTM references are supplied (e.g. TAN, TBN, flash point, CRM)

See our extensive database at www.tamson.com

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PMI PM Tamson Instruments

Calibration Baths



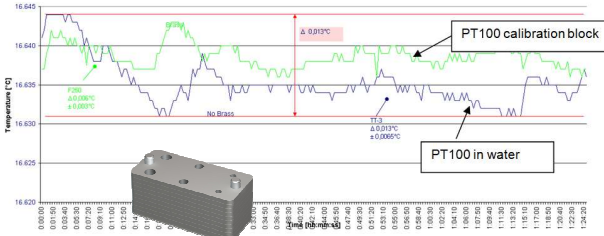
- ✓ Ultra stable +/- 0.005°C
- ✓ Stainless steel bath
- ✓ Optional 0.001°C readout
- ✓ Range from +10°C up to +120°C for TV12
- ✓ Range from +10°C up to +230°C for TV4000mkII DC
- ✓ Range from -50°C up to +100°C for TV12LT
- ✓ Custom holders, platform and blocks possible

Calibration blocks

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Two times better accuracy when using calibration block



Temperature (°C)

PT100 calibration block

PT100 in water

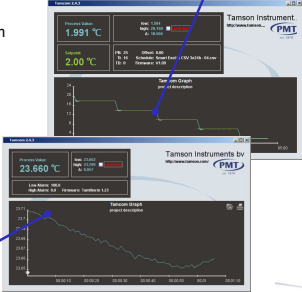
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TamCom

Send set point file to TLC30

- Free download from www.tamson.com
- Auto detect Tamson equipment
- Zoom function
- Export as picture or CSV
- Min max value
- Realtime display
- Program set point curve




Temperature Logging
Set point
Real time

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PMI PM Tamson Instruments

Calibration

Tamson Controller Unit



- ✓ Ultra accurate temperature control
- ✓ 0.001 resolution/sec on DC control
- ✓ Readout 0.001°C
- ✓ RS232 control, free software (logging, SP file)
- ✓ High precision milli - Kelvin control
- ✓ AC and DC voltage control
- ✓ Easy to operate

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PMI PM Tamson Instruments

New Development

- ✓ TLC80 - TLC40 & TLH80 – TLH40
- ✓ TV12LT-80
- ✓ Oxidation stability baths (e.g. ASTM D2440)
- ✓ Dry baths

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Thank you for your attention

