Tamson Instruments

Specification sheet

Filter Blocking Tendency

ASTM D2068 - IP 387 - CEN N403 - EN590 - IP PM EA

Item	Unit	TFBT
P/N		00T0945
FBT range		1.0 to 30 (low number is best)
Output		Printer
Temperature	[°C]	± 0.05°C
		IEC 751
Pressure	[%]	nonlinearity 0.5
	[mBar]	Accuracy 1
	[mBar]	Max pressure 1500
Volume	[mL]	Linearity ± 0.2
	[mL]	Range 0 - 300
	[mL]	Resolution ± 0.5
Timers	[sec]	± 0.001
Voltage	[Vac]	85 .. 264
Frequency	[Hz]	47 .. 63
Power	[W]	40
Dimensions	[mm]	280x350x620 (LxWxH)
Weight	[Kg]	11
CE	Conforms to CE regulation	

- **Small footprint**
- **Easy to use, menu guided test**
- **Touch screen**
- **Printer included**
- **Password protection**
- **Electronic calibration**

TFBT

General

The Tamson Filter Blocking Tendency-tester (TFBT) is an automated instrument designed to test the Filter Blocking Tendency (FBT) of distillate fuels including diesel, biodiesel (B100 & B5/7/20/30), gas oil, gas turbine fuel, and kerosene. It conforms to ASTM D2068 and IP 387. Cold flow issues with diesel containing FAME (biodiesel) and FAME material has resulted in the development of the new EI Industry test (IP PM EA) method standard to check quality of FAME and diesels to avoid major fuel operability problems.

Fuel cleanliness is also an important issue as modern fuel injectors and injection pumps are being manufactured to more precise tolerances. Particles due to contamination, degradation, or corrosion of storage vessels can quickly clog filtration systems.

A FBT test determines whether fuel can potentially block filters in the distribution network or during use in a vehicle or power plant.

The automated FBT provides a graphical guided user interface using a resistive touch screen. This screen guides the user through the test procedure. The guidance results in reliable performance of this test and the user can see what the apparatus is doing when it strictly follows the prescribed steps in the test method.

The fuel sample for this test is drawn from the fuel reservoir beaker with a constant flow of 20 mL/min by the piston pump. A pulse damper provides smooth and continuous flow. Fluid level, pressure and temperature of the sample are continuously monitored while it is pumped through the specified filter into the fuel receiver beaker. Depending on the test, the result is calculated when 300 mL of sample is pumped or the test is aborted when the maximum pressure is exceeded. When 300 mL of fluid is pumped, the end pressure is used to calculate the FBT number, or when the pressure reaches 105 kPa before the 300 mL is passed, the volume of fluid pumped at this moment is used to calculate the FBT number.

Result

Test result is displayed on screen and can be printed out, multiple copies if required. In the menu different parameters can be set for the test and calibration of the temperature, pressure, pump speed, and level sensor. The display provides the operator with test procedure information.

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Following test results are printed:

- Date / time
- Username
- Procedure (A or B, C is not yet available)
- Test result
- Time
- Flow (calculated)
- Sample temperature
- Pressure
- Volume
- FBT Value
- Bias between procedures “A” and “B”

The thermal printer is integrated and provides a permanent record of all the test parameters. A graph is available when the full 300 mL of sample has been pumped.

The fuel sample is drawn from the fuel reservoir beaker by the piston pump, and a pulse damper provides a smooth and continuous flow. The pressure and temperature of the fuel are continuously monitored while it is pumped through the specified filter into the fuel receiver beaker. A pressure relief valve is located on the arm holding the filter assembly. The flow adjustment of the piston pump has a locking mechanism. The complete TFBT, including the fuel input and output assemblies are directly grounded to avoid the build up of static electricity.

The test result is calculated depending on the test:

- when 300 mL of sample was pumped
- if a maximum pressure is exceeded

The graphical screen offers the following:

- easy menu guided operation,
- step by step guidance of the test,
- easy entrance, one guest user and seven operators*
- screen to edit passwords and users*
- service screen* to check sensor values
- service for setting all test parameters*
- separate service screen to set pump speed, and calibrate** level, pressure and temperature sensor.

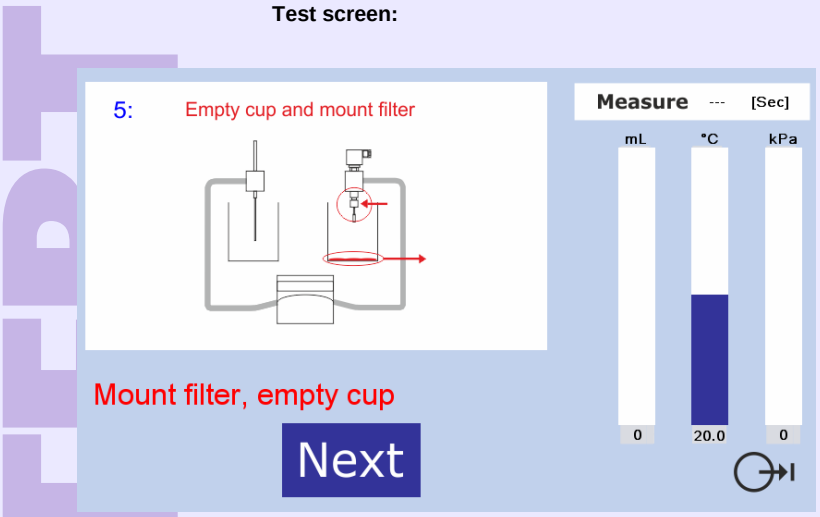
* Password protected

** Calibration fully is performed using the graphical display

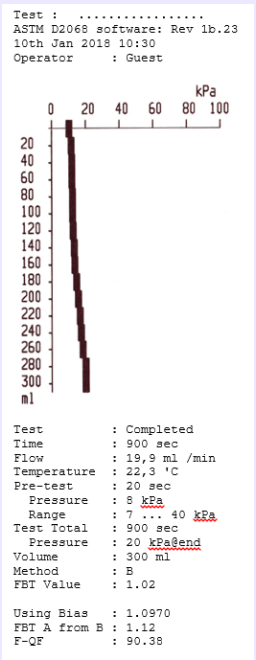
Procedures “A” and “B”

The TFBT is equipped to operate according procedures “A” and “B”. An adaptor block (P/N **15T0005**) for both procedures is available and is standard included with the TFBT. Procedure "A" consists of a stainless steel reusable filter housing and a small disposable filter media. The filter media is replaced for each test. Procedure "B" uses a disposable filter (media in plastic housing).

Test screen:



Graphical print out :



Filter Blocking Tendency

Accessories

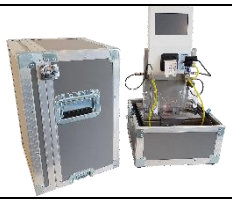
Standard included accessories with P/N 00T0945			
Item	**Picture**	**Quantities**	**Description**
15T0005		1	Adapter block for procedure A + B
31T2005		2	Beaker 400 mL made of glass
31T2004		1	Beaker 150 mL
28T7035		1	Printer paper, thermal, set of 5, 57 mm x dia 30 mm x 8 mm
24T0075		1	Adapter for procedure “B”
24T0060		1	Filter housing procedure “A” Millipore M5

Necessary accessory for procedure A			
Item	**Picture**	**Quantities**	**Description**
24T0064		1	Pack (98) of filter media for procedure “A” Whatman GF/A (FBT)

Necessary accessories procedure B			
Item	**Picture**	**Quantities**	**Description**
24T0067		1	Pack (98) of filter media for procedure “B” Whatman syringe GF/A
24T0043		1	Silicon anti-splash tubing for procedure “B” (1 meter)

Filter Blocking Tendency

Accessories

Optional accessories for TFBT			
Item	**Picture**	**Quantity**	**Description**
19T9030		1	Calibration kit for volume and pressure, please see details on the next page.
21T0210		1	Carrying case for TFBT – For transport and storage – Separate compartment for accessories – Handles to carry the case
02T3026		1	RS232 connection with software to connect to a PC
25T2230		1	FBT verification fluid for procedure “B” – Bottle of 500 mL – Non Hazardous for shipping – Nominal FBT value around 2 – Up to twelve months of shelf life – Including certificate of analysis

Spareparts TFBT		
Item	**Picture**	**Description**
24T0052		Hose tygon (15 x 3.2 x 6.4 mm). Can be used as anti-splash tubing for procedure A.
24T0060		Filter housing procedure “A” Millipore M5
24T0061		Kit procedure “A” Millipore 4 x set of : O - ring (thick) O - ring (thin) Stainless disc
24T0074		Stainless steel adapter for procedure “A + B”. This adapter is mounted on P/N 15T0005
24T0075		Adapter for procedure “B”. To be mounted on P/N 24T0074

TFBT

Filter Blocking Tendency

Calibration kit FBT

Calibration kit containing volume (beaker) and pressure (case) accessories needed for calibration. Contents of P/N 19T9030 is specified below			
Item	**Picture**	**Quantity**	**Description**
31T0041		1	Pressure meter
31T2010		1	Measuring cylinder 500 mL
24T0052		1	Tubing tygon (per 1 m)
14T0305		1	Overpressure safety set to 2 Bar
28T4148		1	Festo T-Piece hose inner diameter 4 mm
14T0304		1	TFBT pressure calibration adapter filter for procedure "B"

TFBT

Filter Blocking Tendency

Unique selling points

Compare our unique selling points:
• Single voltage from 85-230V, 50-60Hz.
• Excellent pump regulation guarantees a perfect constant flow. The flow is independent of the pumps' counter pressure.
• Small dimensions, portable, suitcase model on request.
• Equipped with a graphical touch screen.
• Real-time curve is shown (PC not required to view).
• Visually guided test using step-by-step instruction graphs.
• Equipped with integrated printer.
• Fully electronic calibration.
• Temperature calibration traceable to IEC 751.
• PT100 can be replaced and calibrated using standard 1/10 DIN and an IEC 751 certificate.
• Touch screen is used to select perform the test, set the test parameters and calibrate the sensors.
• Service screen checks all sensors.
• Password protection
  Service screen for calibration,
  Service screen for test parameters,
  Seven Users and one guest,
  If passwords protection is not required it can be switched off.
• Pre-settable user names.
• Resolution of temperature (± 0.05°C), pressure (non- linearity = 0.5%), (± 0.5 ml) and (±0,001 sec) timer.
• Printout of calibration data.
• Service screen to monitor sensor and pump speed.
• Integrated stopwatch / timer .
• Easy check and calibration of pump, semi-automated no additional tools needed.

TFBT