

# Filter Testers for Air Filter and Media Efficiency Measurement



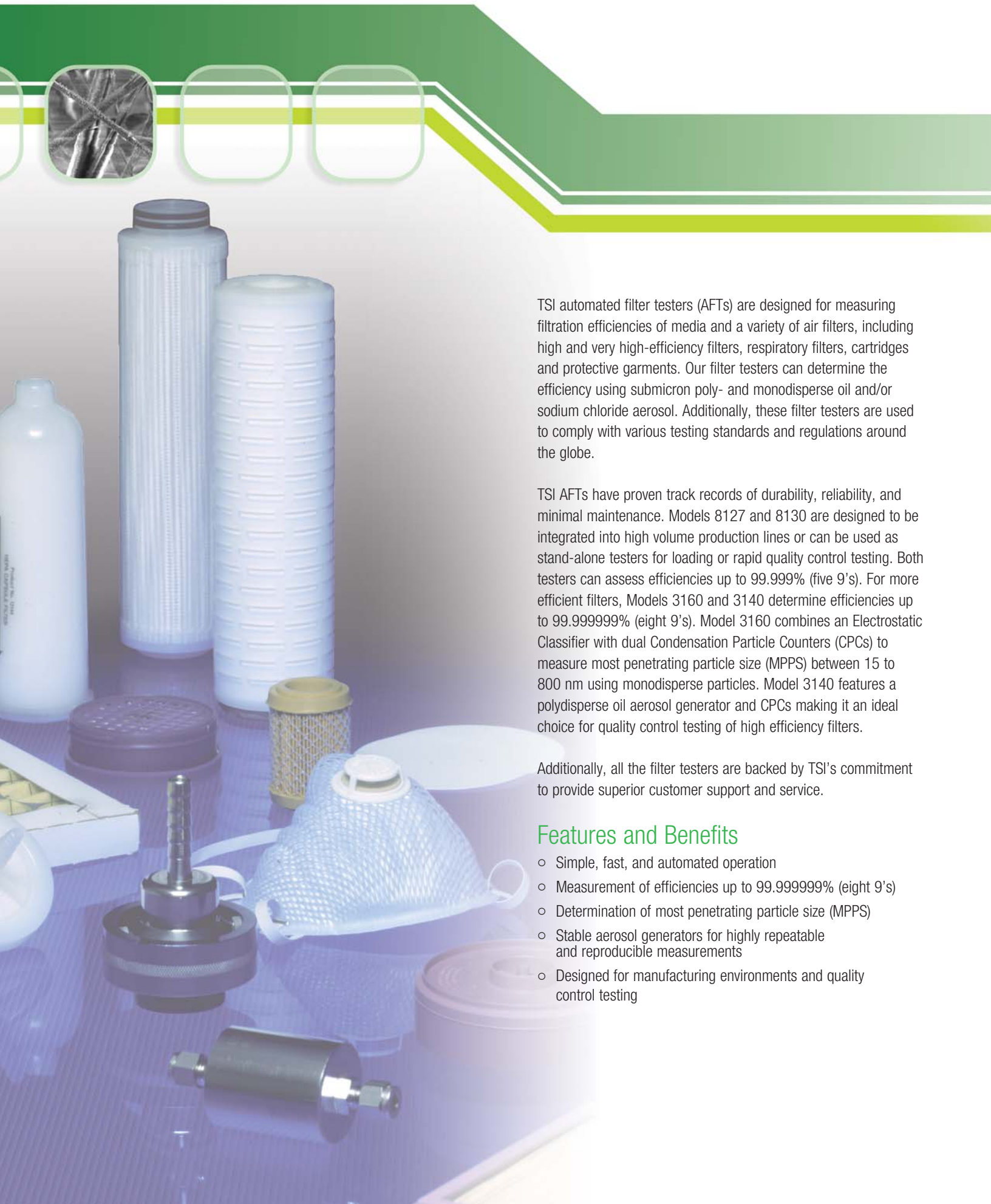
PARTICLE INSTRUMENTS

Automated Filter Testers



TRUST. SCIENCE. INNOVATION.

# Trusted by Filter Manufacturers



TSI automated filter testers (AFTs) are designed for measuring filtration efficiencies of media and a variety of air filters, including high and very high-efficiency filters, respiratory filters, cartridges and protective garments. Our filter testers can determine the efficiency using submicron poly- and monodisperse oil and/or sodium chloride aerosol. Additionally, these filter testers are used to comply with various testing standards and regulations around the globe.

TSI AFTs have proven track records of durability, reliability, and minimal maintenance. Models 8127 and 8130 are designed to be integrated into high volume production lines or can be used as stand-alone testers for loading or rapid quality control testing. Both testers can assess efficiencies up to 99.999% (five 9's). For more efficient filters, Models 3160 and 3140 determine efficiencies up to 99.999999% (eight 9's). Model 3160 combines an Electrostatic Classifier with dual Condensation Particle Counters (CPCs) to measure most penetrating particle size (MPPS) between 15 to 800 nm using monodisperse particles. Model 3140 features a polydisperse oil aerosol generator and CPCs making it an ideal choice for quality control testing of high efficiency filters.

Additionally, all the filter testers are backed by TSI's commitment to provide superior customer support and service.

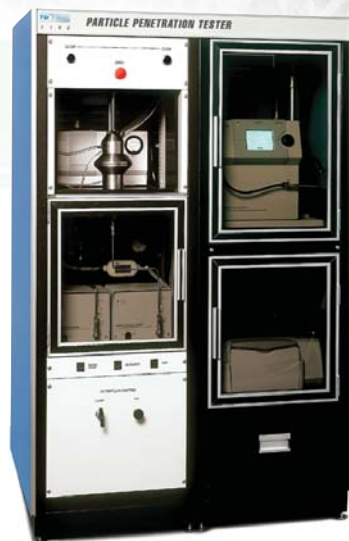
## Features and Benefits

- Simple, fast, and automated operation
- Measurement of efficiencies up to 99.999999% (eight 9's)
- Determination of most penetrating particle size (MPPS)
- Stable aerosol generators for highly repeatable and reproducible measurements
- Designed for manufacturing environments and quality control testing

# Around the Globe



Model 8127 and 8130



Model 3160



Model 3140

## Specifications

Model	8127 <sup>a</sup>	8130 <sup>a</sup>	3160	3140
Measurement Application	Loading and Quality Control Tests		MPPS	Quality Control Test
Maximum Efficiency	99.999%		99.999999%	99.999999%
Aerosol Type <sup>d</sup>	DOP, PAO, DEHS, Paraffin, and other Oils	DOP, PAO, DEHS, Paraffin, and other Oils or NaCl	DOP, PAO, and other Oils or NaCl	DOP, PAO, DEHS, Paraffin, and other Oils
Aerosol Generation	Atomizer		Atomizer with Classifier	Atomizer
Count Median Diameter <sup>b</sup>	0.2 µm (Oil)	0.2 µm (Oil) or 0.075 µm (NaCl)	N/A	0.19 µm
Geometric Standard Deviation <sup>b</sup>	<1.6 (Oil)	<1.6 (Oil) or < 1.86 (NaCl)	<1.3	<1.6
Flow Rate	15 to 100 L/min		5 to 100 L/min	
Resistance	0-150 mm H <sub>2</sub> O (0-1470 Pa)			
Particle Detection	Light Scattering Photometer		Condensation Particle Counter	
Typical Test Length	10 sec		30 sec to 20 min <sup>c</sup>	< 1 min <sup>c</sup>
Data Reporting	Alpha-Numeric Display and RS-232		PC with Integrated Software	
Operation	Stand Alone Tester/Automated Production Lines		Stand Alone Tester	
Compliance	US 42 CFR part 84, EN 143, JMOL, ISO 23328-1		EN 1822 parts 3 and 5	N/A

<sup>a</sup> EN versions (for equivalent results to EN 143 standard) available (8127-1-EN, 8130-1-EN)

<sup>b</sup> EN version CMD and GSD are different. See 8127/8130 spec sheet for more info

<sup>c</sup> Efficiencies higher than 99.9999% require longer than typical testing times

<sup>d</sup> Aerosol abbreviations: DOP (dioctyl phthalate), PAO (polyalpha olefin), DEHS (di-ethylhexyl sebacate)

## Accessories

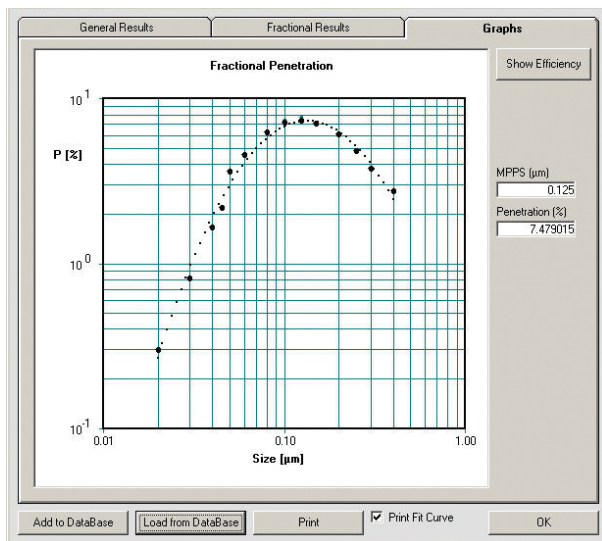
TSI also offers a variety of optional accessories to diversify the capability and applicability of these filter testers. Individual models may also have additional accessories (refer to model specific information sheet).

## Custom Filter Holders

TSI has an experienced design team and a fully-equipped machine shop to address special requirements from our customers. Over the years, TSI has designed and built more than 100 custom filter holders to accommodate testing filters with different shapes and sizes. We are ready to serve the specific needs you have. Please contact your TSI representative for details about the customized solutions we offer.

## External Adapter

The Model 8107 External Adapter allows users to test tubular, rectangular or other irregular shaped filter cartridges that have their own housing.



MPPS results acquired from Model 3160

General Results		Fractional Results					Graphs
Size (µm)	Eff. (%)	Pen. (%)	P-95 (%)	delta-P	C-u (1/cm <sup>2</sup> )	C-d (1/cm <sup>2</sup> )	Downstr. Counts
0.020	99.700091	0.299909	0.299909	42.362	1.05E+04	3.15E+01	1.52E+04
0.030	99.181933	0.81807	0.81807	42.428	2.20E+04	1.80E+02	9.01E+04
0.040	98.329135	1.674965	1.674965	42.429	2.49E+04	4.16E+02	2.01E+05
0.045	97.81322	2.18678	2.18678	42.416	2.37E+04	5.19E+02	2.59E+05
0.050	96.363434	3.636566	3.636566	42.44	6.98E+04	2.54E+03	1.27E+06
0.060	95.389674	4.614326	4.614326	42.434	6.74E+04	3.11E+03	1.55E+06
0.080	93.65837	6.34163	6.34163	42.476	4.98E+04	3.16E+03	1.58E+06
0.100	92.795914	7.204186	7.393789	42.53	1.21E+03d	8.74E+01	4.23E+04
0.125	92.620985	7.479015	7.710421	42.542	8.53E+02d	6.38E+01	3.19E+04
0.150	92.85338	7.14662	7.14662	42.566	6.58E+04	4.70E+03	2.27E+06
0.200	93.857823	6.142177	6.142177	42.56	3.03E+04	1.86E+03	9.32E+05
0.250	95.140555	4.959445	4.959445	42.578	1.46E+04	7.08E+02	3.54E+05
0.300	96.206399	3.793601	3.793601	42.584	7.45E+03	2.82E+02	1.41E+05
0.400	97.236122	2.763878	2.763878	42.631	2.37E+03	6.56E+01	3.28E+04

MPPS results acquired from Model 3160

TSI Incorporated serves a global market by investigating, identifying and solving measurement problems. As an industry leader in the design and production of precision instruments, TSI partners with research institutions and customers around the world to set the standard for measurements relating to aerosol science, air flow, health and safety, indoor air quality, fluid dynamics and biohazard detection. With headquarters based in the U.S. and field offices throughout Europe and Asia, TSI has established a worldwide presence in the markets we serve. Every day, our dedicated employees turn research into reality.

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