

International Filter Testing Services



IFTS SERVICES  
IFTS TEST BENCHES



**IFTS, Institut de la Filtration et des Techniques Séparatives, International Filter Testing Services** is the international reference center for Solid-Liquid Separation. Founded in 1981, IFTS is a non-profit organization that acts as a meeting point between research and industry and between Separation Equipment manufacturers and users.

IFTS (<http://www.ifts-sls.com/>) is an independently regulated, ISO 17025 accredited, laboratory and research center focusing on liquid filtration and separation science.

The management at IFTS has compiled a world class team of scientists, engineers and technicians in the field of Solid - Liquid Separation (SLS). IFTS provides a global resource for professionals working in SLS.

IFTS skill is exercised in all types of industries including the automotive, chemical, aerospace, mechanical and nuclear industries.

IFTS head office is based in Foulayronnes located in the south-west portion of France near Agen (half way between Toulouse and Bordeaux).

**IFTS owns a subsidiary in the USA (Middlesex, NJ), manages a sales office in China (Shanghai) and has contracted with representatives in Germany, Saudi Arabia and soon in a few more locations worldwide.**

IFTS leads the industry in terms of standardized testing methods promoting, for decades now, innovating approaches to ISO committees and leading projects through the standardization processes. In addition, IFTS is recognized as a training center providing a full range of technical sessions.

### IFTS OFFERS DEDICATED SERVICES SHOULD YOU NEED TO:

- > Evaluate the performance of your liquid filters;
- > Acquire test benches designed as per standardized or customized specifications;
- > Evaluate the particulate contamination level of parts or components;
- > Improve the quality of your production with regards to potential particulate contamination;
- > Contribute to the design of new filter elements and search/development of new filtering media;
- > Implement or optimize your SLS process;
- > Calibrate your optical particle counters and fluid contamination monitors;
- > Supply your quality department with secondary calibration suspensions (SCS400);
- > Optimize your key assets : train your team

### IFTS RESEARCH AND STANDARDIZATION ACTIVITIES

#### TECHNOLOGICAL WATCH

Permanent watch  
SLS key players and solutions database

#### R&D PROGRAMS

Thanks to industrial consortia and State support  
In partnership with French Universities

#### STANDARDIZATION

Strong contribution to French, European,  
and ISO committees



Filter Testing Services



Measures and characterization



Water Analysis



Calibration Services & Suspensions

### SOLID-LIQUID SEPARATION

Filter Test Benches



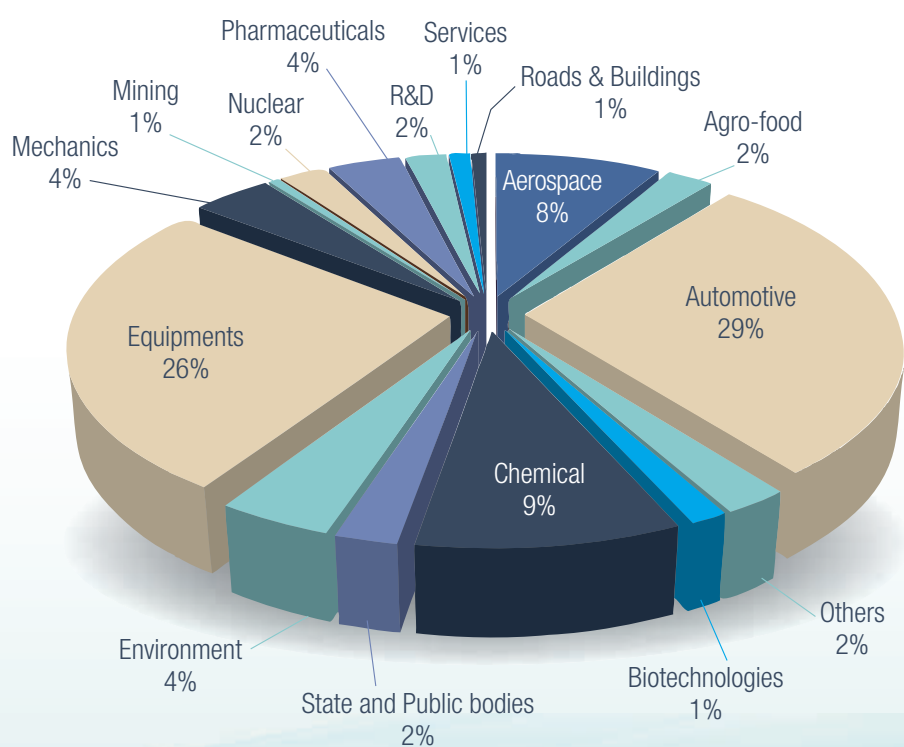
Consulting



Separation Process Optimization



Training



## MEMBERS OF THE ASSOCIATION IN YEAR 2013

They are small or large companies.

They have an important activity in solid-liquid separation.

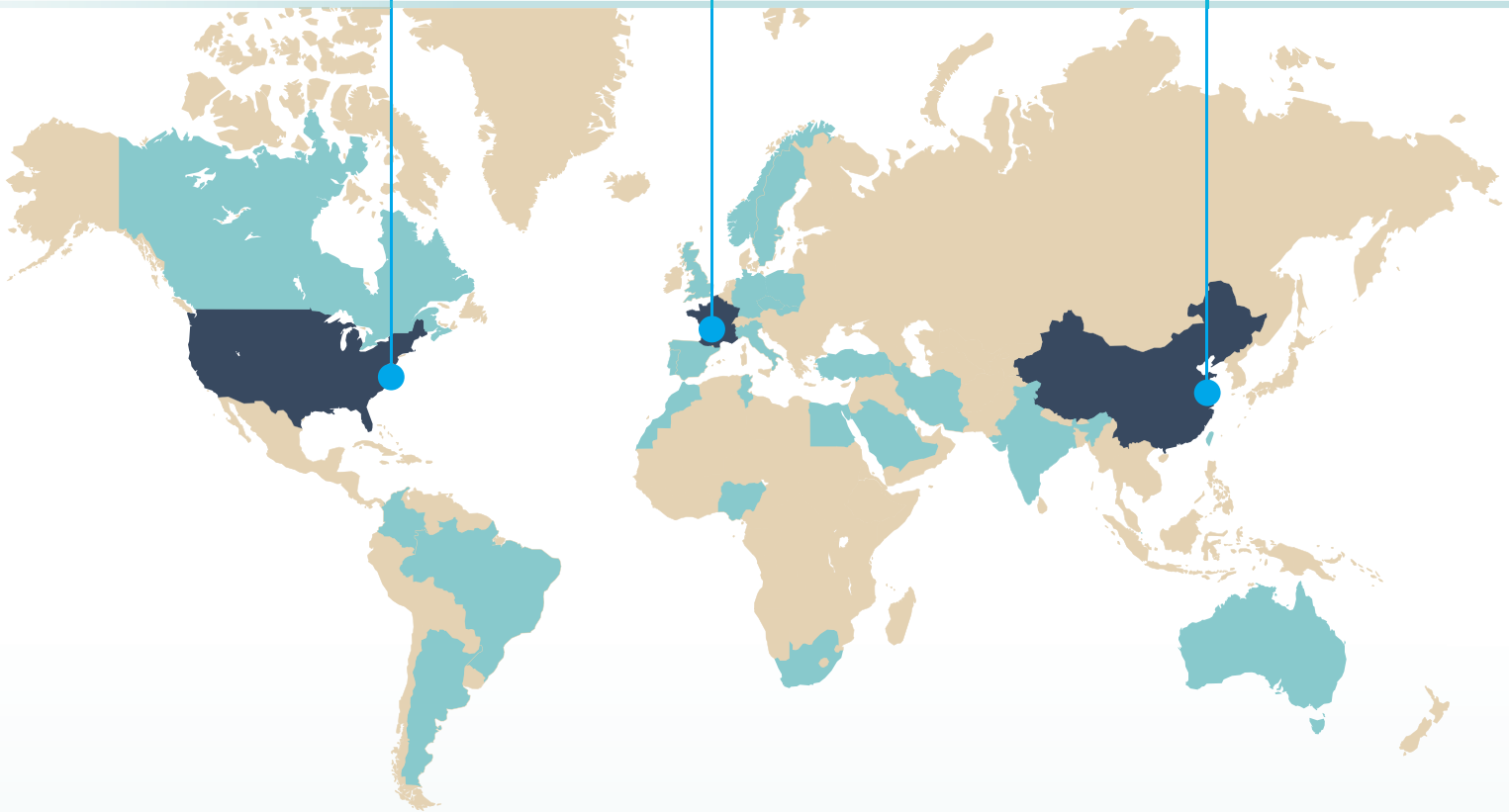
They appreciate the quality and conditions of our interventions.

**They joined IFTS.**

3M PURIFICATION	EFILTEC SOLUTIONS	SAATI
ADEQUATEC	FAURE EQUIPEMENTS	SEFAR FYLTIS
AHLSTROM Research & Services	FEDERAL MOGUL	SERMETO EI
ALFA LAVAL MOATTI	FERMENTALG	SOFRANCE
ANDRITZ	GAUDFRIN	SOGEFI FILTRAUTO
APPH	HYDAC SARL	SOLETANCHE BACHY
BEKAERT	LE BOZEC FILTRATION ET SYSTEMS	SPCB
BERNARD DUMAS	MAHLE FILTRATION INDUSTRIELLE	SYNDICAT DES EAUX D'ILE DE FRANCE
BORGWARNER	MORTELECQUE	TOTAL Petrochemicals
CEA	NOVINTEC SA	TECNOFIL
CECA	OTV	TECSEL
CUMMINS FILTRATION	PALL FRANCE	UFI FILTERS
DESJOYAUX Piscines	RELLUMIX	VECO France
EDF	RETTENMAIER FRANCE	VEOLIA EAU - CGE

## IFTS ACCOMPANIES YOU AT EACH STEP OF YOUR PROJECT DEVELOPMENT





● IFTS headquarters and subsidiaries

● IFTS customers







## IFTS SERVICES

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### 30 YEARS OF EXPERIENCE



#### PRODUCTS TESTED

- All liquid filters and filtering media
- Solid-Liquid Separation equipment
- Mechanical Components (wear)
- Measuring instruments, particle counters and contamination monitors

#### CHARACTERISTICS TESTED

- Intrinsic: porosity, pore size distribution, wettability
- Hydraulic: permeability, head loss,
- Functional: efficiency, life time, dirt holding capacity,
- Compatibilities: chemical, thermal, mechanical, biological, media release/migration/cleanliness

#### TEST PROCEDURES

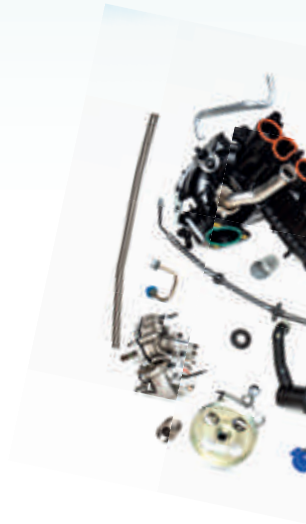
- International/European/National standards
- Tailor-made tests according to customer specifications

Leadtime is a key factor for our customers : IFTS has a special policy to turn results out within a guaranteed time frame should the customer specify it.

IFTS is a dynamic, responsive organization with the ability to provide most cost estimates within 24 hours.

IFTS is an ISO 17025 test laboratory with capability granted by the French organization COFRAC of validating its own test procedures.

Our team, led by some of the top PhD. engineers in the field, is available to provide expert advice.

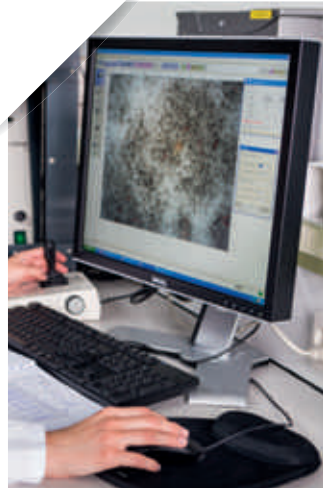




## A WIDE OFFER OF SERVICES



- Filter testing
- Fluid cleanliness classification
- Expression of particulate contamination levels of parts and components
- Parts and components cleaning
- Wear and endurance testing
- Confidential consultancy
- Calibration and supply of calibration suspensions
- Many others on request



## STANDARDIZATION

IFTS contributes to all international standards concerning contamination and solid-liquid separation.

### International

- |            |   |
|------------|---|
| ISO TC 20  | Aeronautical fluid circuits                       |
| ISO TC 22  | Fuel filter for internal combustion engines       |
| ISO TC 24  | Granulometry / particle counting                  |
| ISO TC 70  | Lubricant filters for internal combustion engines |
| ISO TC 131 | Hydraulic power system                            |



## FILTER TESTING SERVICES



IFTS is an independent testing center with world recognized expertise and unique facilities to measure all characteristics of all types of liquid filters.

Each year, hundreds of filters are evaluated by International Filter Testing Services. IFTS hosts the sole center in Europe able to offer such a wide range of standardized and custom-made methods to compare, evaluate or qualify filters.

Our world-wide clients are:

- Filter manufacturers, who entrust their Research and Development programs to IFTS and require certification of performance and/or conformity with specifications
- Consumers and industrial users of filters who require comparative tests or verification of conformity of filters to their specifications.

The quality of tests is guaranteed by a rigorous management of test procedures according to ISO 17025.

### IFTS tests:

- > All liquid filters (fuels, oils, hydraulic fluids, drinking water, and other industrial liquids...)
- > All filtration thresholds (from sterilization filters to self-cleaning filters)
- > All flow rates between 1 l/h and 50 m<sup>3</sup>/h (800 l/min)
- > Static and differential pressures up to 500 and 100 bar respectively

### IFTS measures and certifies liquid filters by testing:

- > Integrity (bubble point)
- > Separating performance (filtration efficiency, retention capacity, absolute rating, bacterial retention, water removal...)
- > Hydraulic and mechanical characteristics (permeability, flow/pressure fatigue, pressure loss, burst or collapse pressure...)
- > Chemical or thermal compatibilities.

### IFTS:

- > Implements all standard procedures (NF, CEN, ISO, ASTM, JIS, SAE...) and also any method specified by clients
- > Works with customers to develop test methods for new filters brought to the market

All IFTS test benches are designed and manufactured internally; it includes equipment such as:

Diesel fuel-water separator Test Benches - ISO 16332 - SAE J1488/J1839

Fuel filters for diesel engines – Test methods for road vehicles - ISO 4020

Filtration Efficiency and Retention Capacity Test Benches ISO 4548-12 – ISO 16889 – ISO 19438 - SAE J1858 (Steady flow) ISO 23369 (cyclic flow)

Filter media integrity test bench - ISO 2942; EN 24003; ASTM E1294

On line Automatic Particle Counter (APC) and FMC calibration test rig - ISO 11943

Single-Pass / Gravimetric Fuel Filter Test Rigs - SAE J1985 / SAE J905

Single-Pass - efficiency and retention capacity - water filter - EN13443

## IFTS CAPABILITIES



FILTRATION EFFICIENCY AND RETENTION CAPACITY -  
STEADY AND CYCLIC FLOW



DIESEL FUEL - WATER SEPARATION



GRAVIMETRIC EFFICIENCY



SINGLE-PASS WATER FILTER EFFICIENCY AND  
RETENTION CAPACITY



FILTER INTEGRITY



PRESSURE DROP CHARACTERISTICS



FLOW FATIGUE



COLLAPSE / BURST



COLD START SIMULATION AND HYDRAULIC PULSE



FUEL AND WATER ICING





## FLUID CLEANLINESS CLASSIFICATION



### FLUIDS ARE A REPOSITORY FOR PARTICULATE CONTAMINATION

A close control of fluids contamination level is a first step towards quality and system efficiency.

### FLUID CLEANLINESS ASSESSMENT

By using the appropriate sampling method and applying the most suited analysis technique (Microscope, Particle Counter, Contamination Indicator), the cleanliness level of all types of fluids is consistently assessed.

#### Means

- > Lazer diffraction
- > Light absorbtion
- > Microscope image analysis
- > Resistance variation

#### Type of fluids

- > Oils
- > Solutes for injection
- > Drinking water
- > Hydraulic fluids

#### Type of contaminants

- > Burr
- > Fibers
- > Grains
- > Mineral and organic



*All sizes : between 0.1 and 1000  $\mu\text{m}$*



## EXPRESSION OF PARTICULATE CONTAMINATION LEVELS OF PARTS AND COMPONENTS

*Components shall bring value to a system not contamination*

### COMPONENT CLEANLINESS ASSESSMENT

A dedicated lab and a specialised team to assess the particulate contamination of parts and components.

#### Extraction

agitation, pressure rinsing, ultrasonic bath, functional bench

#### Analysis

gravimetric analysis, particle counting and sizing by light extinction, microscopic analysis.

#### Results and reports

According to ISO standards or customer specification.



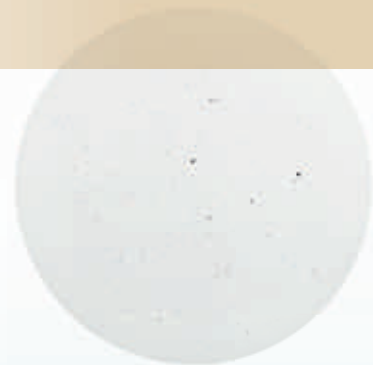
## PARTS AND COMPONENTS CLEANING

IFTS has a strong experience in particulate contamination management and control.

IFTS technical team performs more than 1000 cleanliness tests per year applying all possible extraction methods. This leads IFTS to offer customized cleaning services dedicated to high value components or key and sensitive parts.

IFTS does not rely on industrial washing machines but rather tailored processus using skilled personnel.

IFTS can decontaminate series of parts and guarantee the result in a cleanliness certificate.



## WEAR AND TEAR

All components in contact with fluids may be affected by solid particles suspended in liquids. Those particles represent a risk to lower components performances and their life duration. For this reason, special attention shall be paid to reducing the sensitiveness of components to wear and tear.

### IFTS, A RELIABLE PARTNER

IFTS is the expert you can rely on for defining the maximum level of contamination acceptable for your components.

### A UNIQUE TEST FACILITY IN EUROPE

IFTS offers state of the art amenities and a highly qualified team to draw test protocols and setup test rigs to measure wear of major sensitive components: Pumps, valves, regulators, distributors, etc...

Wear and tear tests can be carried out in all operating conditions:

- Flow rate from 0 to 100 l/min
- Pressure from 0 to 400 bar
- Frequency from 0 to 5 Hz
- Temperature from -20°C to 180°C



### IFTS CAN PERFORM WEAR AND TEAR TESTS WITH ANY KIND OF PARTICULATE CONTAMINANTS AND FLUIDS

All types of contaminants: (silica powder, carbon, MIL-E-5007 E...), all sizes (from a few  $\mu\text{m}$  to several mm), at all concentrations from few particles per ml up to several g/l.

In any fluid (standard oil or customer specific fluids).

IFTS records all test conditions and functional parameters (RPM, power consumption, flow rate or generated pressure, response time... ) to define their evolution vs. contaminant size and concentration.



*IFTS is the partner for all mechanical workshops*

### **CONSULTANCY ON CLEANLINESS**

IFTS offers an in-factory appraisal and advises industrial sites wishing to reduce the particulate contamination of their products.

This offer includes the following elements:

- Detailed study of the organization, practices, tools and equipment
- Detailed study of processes leading to optimum solutions to all problems
- Identification of the sources of particulate contamination
- Elaboration of a corrective plan of actions

IFTS finds effective, practical solutions adapted to the site budget and priorities.

### **Assistance in drawing up cleanliness specifications**

IFTS works hand-in-hand with the Research and Study Departments of manufacturers (automotive, aeronautical, fluid power . . .) and their equipment suppliers for writing cleanliness specifications at required level.

### **International recognition**

IFTS was involved at writing level in most of the international standards for the measurement, expression and management of cleanliness of components and fluid systems for industries, including:

- Automotive (ISO 16232),
- Aeronautical (ISO FDIS 12584)
- Hydraulic (ISO 18413, ISO TS 10686)



### **OPTIMIZATION OF MACHINING FLUIDS TREATMENT PROCESS**

- > Feasibility study of regeneration of bath lubricants: choice of recycling scenarios; test on site.
- > Clarification of process water for recycling: laboratory study, pilot.
- > Expertise, optimization study of lamination fluids treatment.
- > Optimization of a purification unit of cutting fluids.
- > Treatment of cutting fluids by a membrane process: manufacturing study, choice of scenarios, techno-economic evaluation, and management.











## IFTS TEST BENCHES

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## IFTS FILTER TEST BENCHES

### 30 YEARS OF EXPERIENCE IN TEST BENCHES DESIGN AND MANUFACTURING

IFTS has designed and manufactured its first test stand in 1984 for its own internal use and has sold the first one to a filter manufacturer in 1990. IFTS strategy since then has been to keep its skill in test bench design and manufacturing for its own ISO 17205 accredited Testing Center accepting rarely to export it outside of IFTS premises.

In year 2011 IFTS decided to change its strategy and set a dedicated organization for selling test benches for any requiring customer. The strategy instantly becomes a success turning IFTS into one of the world leaders in filter test benches design and manufacturing.

### STRONG CUSTOMER SUPPORT ORGANIZATION

A dedicated team allows offering the following services:

- > Technical assistance / troubleshooting;
- > Technical documentation;
- > Customer Service items, including spare parts, support equipment tools and other services such as check-ups, calibration, repairs, exchanges, upgrades...;
- > Guaranteed performances;
- > Warranty and warranty administration;
- > Training of customer personnel

### AN EXPERIENCE BASED ON IFTS INTERNATIONAL STANDARD DEEP INVOLVEMENT

IFTS participates as chairman and expert in the following ISO working groups:

- ISO TC 20 Aeronautical fluid circuits**
- ISO TC 22 Fuel filter for internal combustion engines**
- ISO TC 24 Granulometry / particle counting**
- ISO TC 70 Lubricant filters for internal combustion engines**
- ISO TC 131 Hydraulic power system**



International  
Organization for  
Standardization

As a Research & Development center involved for more than 20 years in all ISO committees drafting filter test standards, whatever their field of application, IFTS is the only stand supplier able to anticipate the upgrading/modification of existing stands to fulfill future standard requirements, if any.

IFTS originated the revision of ISO 4572 leading to the ISO 16889 in the 90ies and, since then, introduced the online particle counting technique (ISO TR13353) and the multipass testing principle in the automotive industry (ISO 19438 and ISO 4548-12). IFTS has introduced in all these standards the now well accepted standard requirements on allowed test conditions.

IFTS is currently the project leader of the revision of ISO 11943 specifying the principles and requirements of online particle counter calibration and secondary calibration suspension preparation.

## PROVEN RELIABILITY

IFTS is its own “best customer” using daily 12 internally designed and manufactured IFTS test benches.

Thanks to a successful technology transfer, IFTS test benches are being operated reliably for years in the broadest scope of conditions at customer facilities worldwide.

Return of Experience is being closely analyzed thanks to the Product Support Organization in place

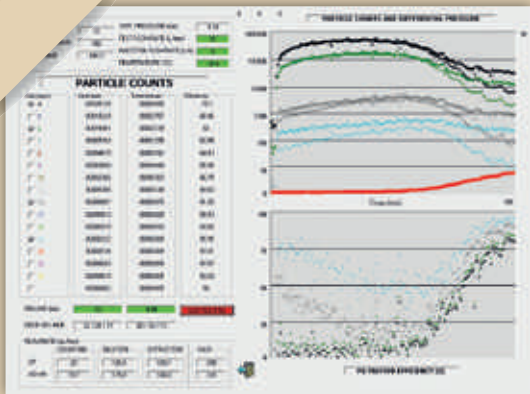
This means IFTS equipment satisfy the most requiring criteria in term of accuracy and reliability.



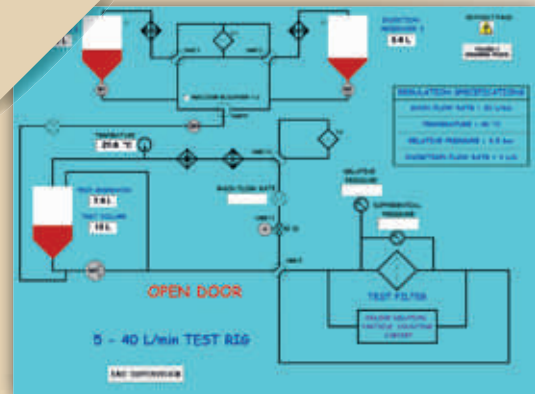
# FILTRATION EFFICIENCY AND RETENTION CAPACITY TEST BENCHES

## STEADY AND CYCLIC FLOW

100% compliant with ISO 4548-12 (lube oil application) - SAE J1858 (steady flow) - ISO 16889 (fluid power application) - ISO 19438 (diesel fuel application) - ISO 23369 (cyclic flow - fluid power application).



Filtration efficiency and clogging curve monitoring at a glance

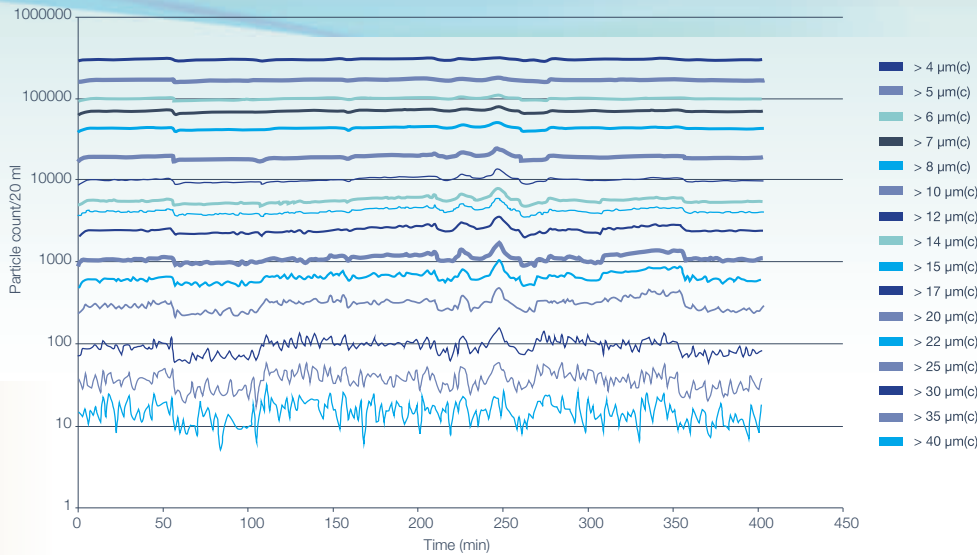


User-friendly interface and test conditions monitoring

*The most advanced design for the most accurate results*

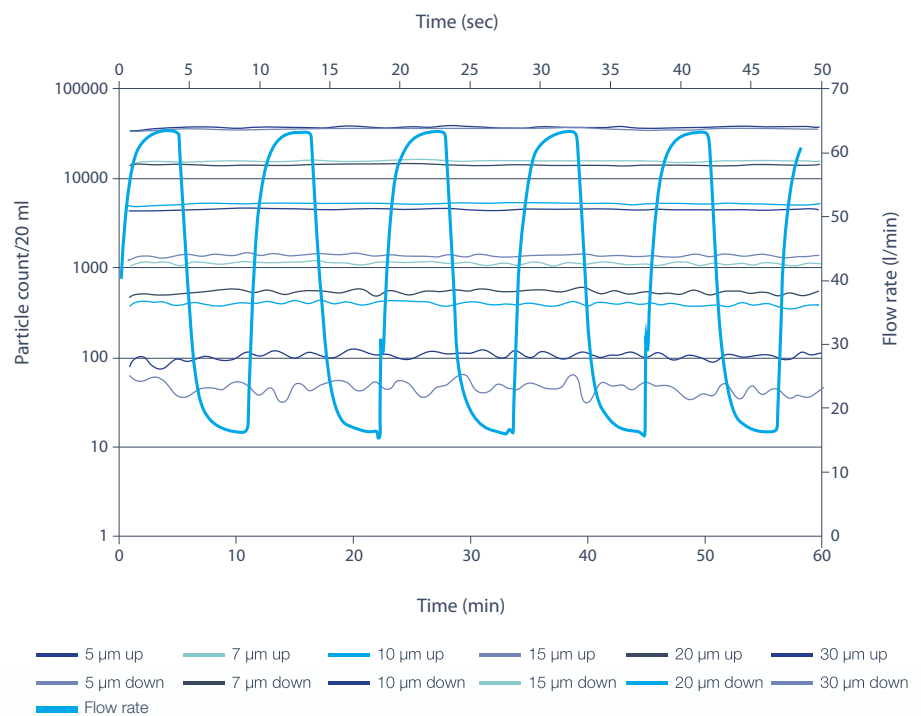






**Stability of test dust injection over time.**  
*Example of stability during 400min, in steady conditions.*

*Stability of particle counting in cyclic flow rate conditions*

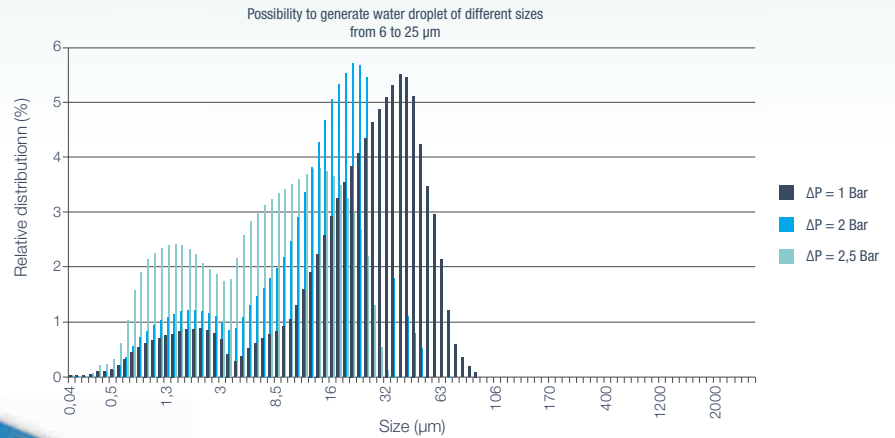


CHARACTERISTICS	DESCRIPTION
Fluid flow (steady)	Experience from 0.25 to 800 l/min
Fluid flow (cyclic)	Experience from 20-100 l/min (frequency 0.1 - 1 Hz)
Number of circuits	From 1 to 3 for the full range of fluid flow
Dimensions	L 2.96 m x W 1.61 m x H 2.03 m
Operation	Ability to be manually operated Ability to operate automatically Automatic data acquisition at the end of the test and automatic switch to clean-up mode Pumps stop upon test completion Automatic start of the bench can be scheduled Test runs until predetermined conditions are reached
Separate dilution and counting cabinet	Automatic report generation according to selected standards On-line continuous Particle Counting 64 channels: 32 upstream / 32 downstream L 0.8 m x W 0.6 m x H 2 m
Filter differential Pressure	Dilution up to 1:30 to guarantee accuracy Up to 40 bar

## DIESEL FUEL-WATER SEPARATOR TEST BENCHES

100% compliant with ISO 16332, SAE J1488 / J1839, ISO 4020 6.5

*Nominal droplet size ranging  
from 2 to 300µm*



Genuine design of water  
droplets generator adopted  
by ISO committees



*Fuel filters fulfill two functions : they retain particles  
IFTS offers solutions to evaluate all performances  
Water Separation efficiency.*

### CHARACTERISTICS

Test fluid  
Number of circuits  
  
Dimensions  
Temperature  
Droplet size range  
Flow rate range  
Option

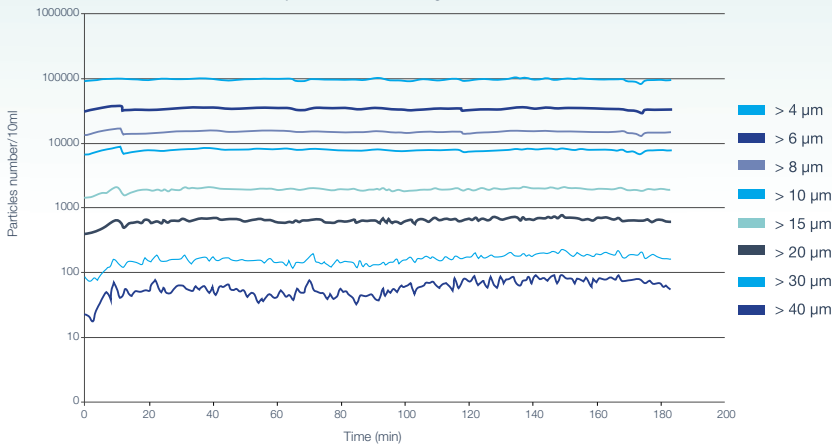
### DESCRIPTION

Biofree B0- B20-B30-B100 diesel fuel – EN 590  
Up to three circuits – one dedicated to SAE J1488, one dedicated to ISO 16332 and SAE J1839 and one dedicated to ISO 4020 6.5  
L 3 m x W 1.5 m x H 2 m - 1000 kg full of fuel  
60 °C (80°C in case of B100)  
2-300 µm  
1-30 l/min (ISO 16332)/ 1-25 l/min (SAE J1488)  
Fullers earth on line processing  
On line water titration  
On line water droplet size analyser

# SINGLE-PASS / GRAVIMETRIC FUEL FILTER TEST RIGS

100% compliant with SAE J1985 / SAE J905

Stabilization of the particle number during time in ISO 4113 fluid



*Test dust injection and particle number:  
Proven performance, even in critical conditions.  
ISO 4113 has a low viscosity, tending to cause particles sedimentation*



*and separate water from fuel.  
of fuel filters : Single-pass gravimetric efficiency and Fuel*

## CHARACTERISTICS

## DESCRIPTION

- Test fluid
- Fluid flow
- Dimensions
- Operation

EN590; bio fuel (B20, B30, B100); bio free fuel – V oil – ISO 4113 – SAE J1696  
 0.5-25 l/min  
 L 2.96 m x W 1.61 m x H 2.03 m - 2 000 kg of oil  
 Ability to be manually operated  
 Ability to operate automatically  
 Automatic data acquisition at the end of the test and automatic switch to clean-up mode. Pumps stop upon test completion  
 Automatic start of the bench can be scheduled  
 Test runs until predetermined conditions are reached  
 Automatic report generation according to selected standards  
 On-line continuous Particle Counting 64 channels: 32 upstream / 32 downstream.  
 L 0.8 m x W 0.6 m x H 2 m  
 Up to 10 bar

Separate counting cabinet

Filter differential Pressure



## FILTER MEDIA INTEGRITY TEST BENCH

100% compliant with ISO 2942, EN 24003, ASTM E1294



*Bubble point test rig dedicated to evaluate the filter integrity of the filter cartridge - Quality control device*

CHARACTERISTICS	DESCRIPTION
Test fluid	IPA or any equivalent solvent
Dimensions (to be customized)	By default: L 1000 mm – D 240 mm – W 250 mm
Option	Automatic refilling and draining of the reservoir

## ON LINE AUTOMATIC PARTICLE COUNTER (APC) AND FMC CALIBRATION TEST RIG

100% compliant with ISO 11943

*ISO 11943 calibration test loop of APC and FMC  
Quality control device*



CHARACTERISTICS	DESCRIPTION
Fluid volume	7L - designed according to ISO 11943
Number of sampling ports	A first one dedicated to the reference APC A second one dedicated to the APC or FMC
Dimensions	L 1 m x W 0.8 m x H 0.8 m
Operation	Ability to be manually operated. Automatic switch to clean-up mode. Automatic start of the bench can be scheduled. Regulation of test parameters such as temperature – flow rate

## A WIDE OFFER OF FILTER TEST BENCHES AND EQUIPMENT

- Filtration efficiency and retention capacity - steady and cyclic flow
- Diesel fuel - water separation
- Gravimetric efficiency
- Single-pass filter efficiency and retention capacity
- Filter integrity
- On line APC calibration
- Pressure drop characteristics
- Flow fatigue
- Collapse / burst
- Cold start simulation and hydraulic pulse
- Clean solvent dispenser





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