



TECHNICAL CAPABILITIES

Process Filtration

Our customers expect us to create filtration systems and technologies that deliver superior performance, quality they require and the peace of mind they want.

Our research and product development facilities are some of the best in the industry. We can design, manufacture and test proprietary media in order to reach optimum filtration performance.

Look to Donaldson for thoroughness and reliability in design, testing and quality control facilities.

CAD (COMPUTER AIDED DESIGN)

Donaldson uses the latest CAD software to model new products and calculate product properties such as stress/strain, thermal analysis, and moments of inertia. Additionally, interference and tolerance stack up can be checked with this software to eliminate production errors. Over 100 Solidworks seats are used within Donaldson, as well as capabilities using Pro-Engineer, NX and Calma.

CFD (COMPUTATIONAL FLUID DYNAMICS)

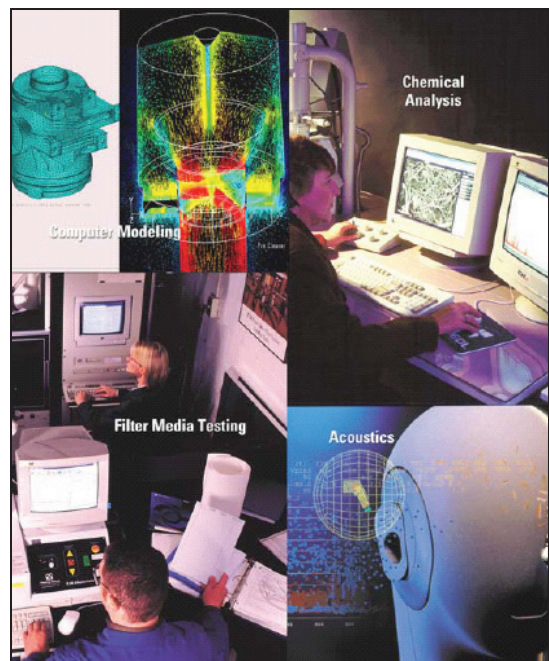
One of the most powerful tools Donaldson has is our CFD software and expertise in using it. Donaldson uses STAR-CCM software to predict properties such as pressure loss, flow distributions, and particle trajectories. This analysis is key to reducing unnecessary pressure losses in the filters and maximizing filter life.

FEA (FINITE ELEMENT ANALYSIS)

Donaldson also uses our FEA capabilities (ANSYS) to ensure structural integrity of our designs and optimize weight, strength and cost of our products.

FILTER AND MEDIA MODELS

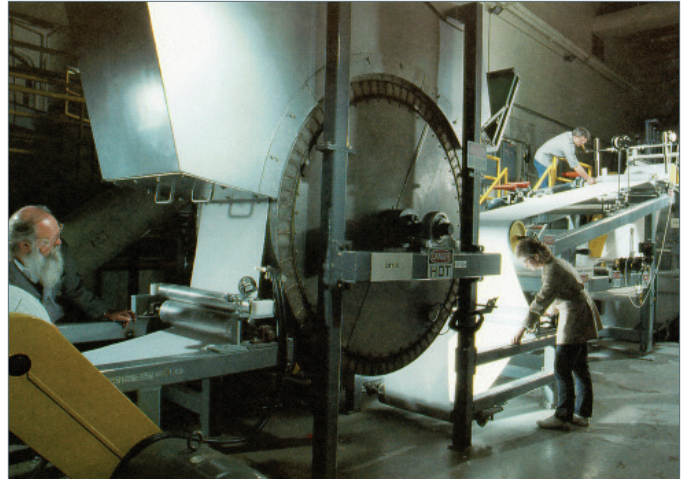
Donaldson has many internally developed proprietary computer models which enable us to predict media performance for a given fiber mixture, initial pressure loss for filter elements of various configurations, and filter loading characteristics with many different contaminants. This enables us to quickly work through many design concepts to optimize the filtration system for a unique application.



PROTOTYPE FILTER MEDIA LAB CAPABILITIES

Unique to the industry, the Donaldson filter media research and development facility provides a capability to develop, test, and produce pilot quantities of proprietary media formulations. This facility supports advanced filtration needs for applications as diverse as military tanks, computer disc drives, and semiconductor processing. Filter media development capabilities include:

- Laser displacement meter
- Pore size distribution measurement
- True density measurement
- Submicron salt loading and efficiency
- Mullen Burst
- TMI Monitor/Burst for evaluation of bursting strength of paper
- Submicron particulate loading and efficiency
- TexTest, bimodal dust bench
- Gravimetric loading benches
- EJA Material Thwing-Albert Tensile Tester to evaluate breaking strength, elongation and tensile energy adsorption
- Gurley Stiffness
- Permeability
- Three Point Bend Tester to obtain physical measurements of effective flexural rigidity, effective stiffness, and/or effective modulus of elasticity for filter media
- Low Efficiency Flat Sheet (LEFS) to measure the initial efficiency of media
- Fractional efficiency bench to measure the penetration and efficiency versus particle size on a given piece of media. It can use two types of aerosol contaminants, NaCl and DOP, and can test up to 12 particle sizes ranging from 0.015 to 0.4 microns
- Salt Loading to determine the life of a given filter media
- Filter media hand sheet fabrication equipment
- Pilot paper mill



STRUCTURAL & ENVIRONMENTAL TEST CAPABILITIES

- AR70-38 Extreme Climatic Conditions
- RTCA DO-160D Environmental Conditions and Test Procedures for Airborne Equipment
- Customer/Application specific test requirements such as ATPD 2167 for the M1 Abrams
- Tensile and compression testers



COMPRESSED AIR FILTRATION LAB CAPABILITIES

Donaldson tests compressed air filters against the ISO 12500 standard.

- Oil aerosol removal – ISO 12500-1
- Vapor removal – ISO 12500-2
- Particulate removal – ISO 12500-3

LIQUID FILTRATION LAB TEST CAPABILITIES

- Fabrication Integrity (Bubble Point) – ISO 2942
- High & low flow multi-pass – ISO 16889, ISO 4548-12
- Cyclic Flow Multipass – ISO 16889, ISO 4548-12, ISO 23369
- Pressure Impulse Fatigue – NFPA T3.10.17-1995, ISO 10771-1:2001
- Multi-Purpose Oil Flow Test System – ISO 2941, ISO 3968, ISO 23181
- Flow Fatigue Test System – ISO 3724, ISO 2941
- Static Material Compatibility Test – ISO 2943
- Dynamic Hot Flow Test – ISO 3968, ISO 2943, ISO 3724
- Environmental Chambers – NFPA T3.10.17-1995, ISO 4548-6
- Low Viscosity Pressure Drop Test – ISO 3968
- Medium Viscosity, High Flow, Pressure Drop Test – ISO 3968
- High Viscosity Pressure Drop Test – ISO 3968
- High Pressure Burst Test System – NFPA T3.10.17-1995, ISO 4548-6
- Fuel/Water Separation, Filter Efficiency Test – SAE J1488, SAE J1839
- Fuel Filter Efficiency & Capacity Test – SAE J1985 Efficiency, SAE J905 Capacity
- Mini-Flow/Flat Sheet Media Multipass Capacity & Efficiency Test – ISO 16889
- Fuel/Water Separation, Flat Sheet Media Efficiency Test – SAE J1488, SAE J1839
- Fuel Filter Analysis
- Karl Fischer Volumetric Titration
- Interfacial Surface Tension Fluid Density
- Gravimetric Analysis – ISO 4405
- MSEP Micro-Separator



SUPPORTING PROCESS AND PRODUCT INTEGRITY

Extensive Product Portfolio

- Process air, steam and liquid filtration products
- Performance engineered to sanitary guidelines
- Wide range of filtration media for any application
- Housings, elements, and parts in-stock, ready to ship

Advanced Technology

- Optimized filtration performance and efficiency
- Extensive research and development capabilities
- Advanced design and testing capabilities
- Over 1,000 engineers and scientists worldwide

Unrivalled Support and Expertise

- Expert technical specialists available as resource
- Comprehensive pre- and post-sale support
- Extensive filter analysis and trouble-shooting
- 100 years of successful global manufacturing



Registered



Standard No. 10-04*



Member of



Member of



Member of



Important Notice

Many factors beyond the control of Donaldson can affect the use and performance of Donaldson products in a particular application, including the conditions under which the product is used. Since these factors are uniquely within the user's knowledge and control, it is essential the user evaluate the products to determine whether the product is fit for the particular purpose and suitable for the user's application. All products, specifications, availability and data are subject to change without notice, and may vary by region or country.



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