



FLOW SCIENCES, INC.

ENGINEERING SAFETY FOR YOUR APPLICATION

TRUSTED AND USED BY:



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FSI CULTURE



Our Highest Quality Ensures Your Excellent Results. Engineering and Consulting firms' involvement in Pharma and Biopharma projects continues to grow every year. For these projects, the ability to provide effective and efficient safety protocols continues to be in high demand. Safety and performance are of the utmost importance, as the pharmaceutical manufacturing companies rely on proper engineering controls to develop and produce consistent products and results, while keeping their personnel and/or product safe. At Flow Sciences, we pride ourselves in the ability to engineer solutions that contain applications properly while creating consistent results.

Versatility and flexibility are key to the most successful pharma and biopharma companies, which is why many of the top design and engineering firms in the world choose Flow Sciences as their trusted containment provider. With products ranging from convertible enclosures for different API toxicity levels to enclosures designed for specific tasks and equipment, FSI has the engineering and production capability to provide solutions throughout the entire manufacturing space.

Flow Sciences takes reproducibility seriously and we are ISO 9001:2015 certified in production quality. Every unique unit receives factory acceptance testing before leaving the facility. Our commitment to manufacture quality products results in the end user's ability to produce quality results. While there are many options available now, new enclosures and systems are being created every day to house the latest and most advanced equipment on the market. If you do not see your application or what you are looking for, please contact us.

DESIGN PROCESS

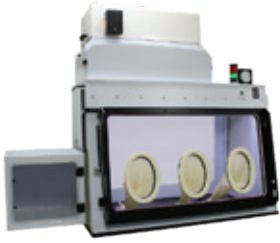
Computational Fluid Dynamics (CFD) is the study of fluid dynamics using sophisticated computing technology. Computational Fluid Dynamics uses or solves the governing equations of fluid or gas flows to predict the characteristics and the structure of a flow field. The most important feature or advantage of using CFD in the design process is the ability to see airflow. CFD allows the user to see the results of engineering design more effectively than in the real world. The effects of minute features in the designing process can be seen and compared using CFD which cannot be done in an otherwise efficient manner. Another added advantage of using CFD is the repeatability of the results.

Flow Sciences uses CFD in the design process in order to concentrate and study the effects of changes in airflow (large and small) in the enclosure design. Any changes to an enclosure's design affect the airflow structure inside the enclosure and FSI's goal is to maintain stable airflow that improves containment while also providing a low turbulent atmosphere that allows sensitive equipment to perform properly and minimize any potential product loss. With CFD we have the advantage of evaluating the performance of the enclosure even before it is built, and then verify those results in our testing lab. This results in our clients receiving enclosures that have proven performance.

CONTAINMENT SOLUTIONS FROM DESIGN TO SITE ACCEPTANCE TESTING

Flow Sciences, Inc. provides engineered containment solutions from research to production. From Occupational Exposure Bands (OEB) 3 to 5, we build to suit your application. Whether in powder manipulation where balance stability is paramount, or using specific manufacturer equipment needing containment, or operating in a temperature and humidity controlled environment, Flow Sciences keeps your personnel and product safe.





GLOVEBOX WORKSTATION

- DESIGNED FOR WORK WITH ANTI-CANCER DRUG CONJUGATE PROCESSING AND OTHER SENSITIVE APPLICATIONS
- HEPA INLET PROVIDES INTERIOR LAMINAR AIRFLOW THAT MEETS OR EXCEEDS ISO 5 ENVIRONMENT



HYBRID ISOLATOR

- ISOLATOR CONTAINMENT LEVELS FOR A FRACTION OF THE COST
- FOR APPLICATIONS THAT REQUIRE CONTAINMENT OF LESS THAN 50 ng/m³



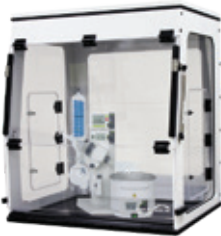
CLASS I BSC

- AVAILABLE IN MANY EXHAUST CONFIGURATIONS WITH SINGLE 4" HEPA FILTER OR DUAL 4" HEPA FILTERS WITH BAG IN / BAG OUT FILTER CHANGE TECHNOLOGY
- REPRODUCIBILITY AND ACCURACY OF WEIGHING IS ACHIEVED BY ENGINEERING CONTROLS THAT CREATE LAMINAR AIRFLOW



BULK POWDER CLASS I BSC

- MOST EFFECTIVE AND EFFICIENT CONTAINMENT FOR BULK POWDER APPLICATIONS AND LARGE DRUM LOADING AND UNLOADING
- PREVENT LOSS OF CONTAINMENT WITH THE 3 MEMBRANE SAFETY SYSTEM FOR SECURING THE DRUM INTO THE INSIDE OF THE ENCLOSURE



LEV III - LOCAL EXHAUST VENTILATION

- SAVE ENERGY AND LAB SPACE BY MOVING PROCESS APPLICATIONS OUT OF FUME HOODS.
- MOST EFFECTIVE AND EFFICIENT CONTAINMENT FOR FLASH CHROMATOGRAPHY, ROTOVAPS, AND MORE.



SAF T FLOW™ CHEMICAL FUME HOOD

- OVERLAPPING SASH BYPASS PROVIDES BETTER CONTAINMENT AND DOES NOT REQUIRE CHANGES IF VAV IS INSTALLED
- SAVE OVER 60% OF ENERGY WITH THE SAF T FLOW™ FUME HOOD SERIES



NITROGENEMA

- ACHIEVE AND MAINTAIN LOW HUMIDITY OR OXYGEN LEVELS
- HEPA FILTRATION TO HOUSE EXHAUST WITH ONE WAY CHECK VALVE



PERFORMANCE



Performance is paramount in the safety industry. Through consistent design quality and expert manufacturing, Flow Sciences' units perform. With surrogate powder testing both in our facility as factory acceptance testing (FAT) and at the customer facility as site acceptance testing (SAT), we consistently exceed our customers' containment targets and goal expectations.

HIGH POTENCY GLOVEBOX WORKSTATION SYSTEM

Containment Target : 50 ng/m³

Result : 0.4 ng/m³

Equipment : Balances

Operation : Weighing / Transferring



CYTOTOXIC DRUG DEVELOPMENT GLOVEBOX

Containment Target : 5 ng/m³

Result : 0.012 ng/m³

Equipment : Balances, Mortar & Pestle

Operation : Weighing, Grinding

PARTICLE ANALYSIS SUITE

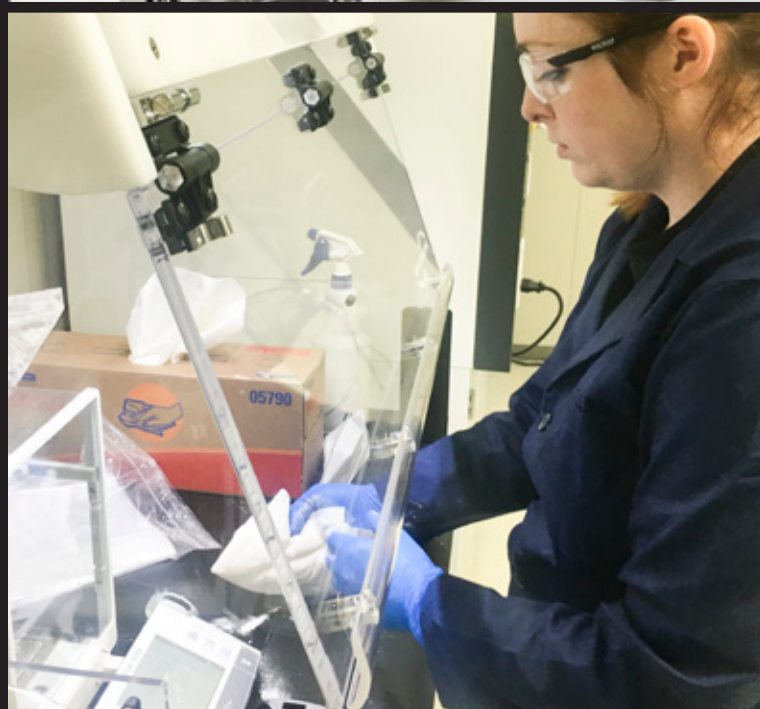
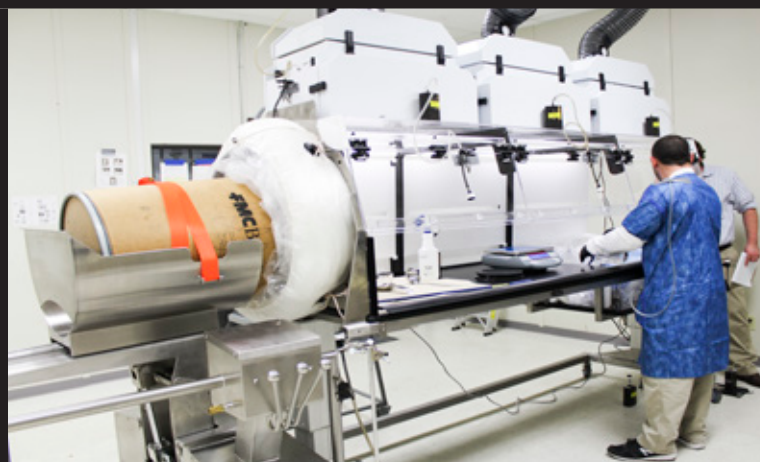
Containment Target : 100 ng/m³

Result : 8 ng/m³

Equipment : Nilfisk, Sympatek

Operation : Sympatec Simulation, Cleaning

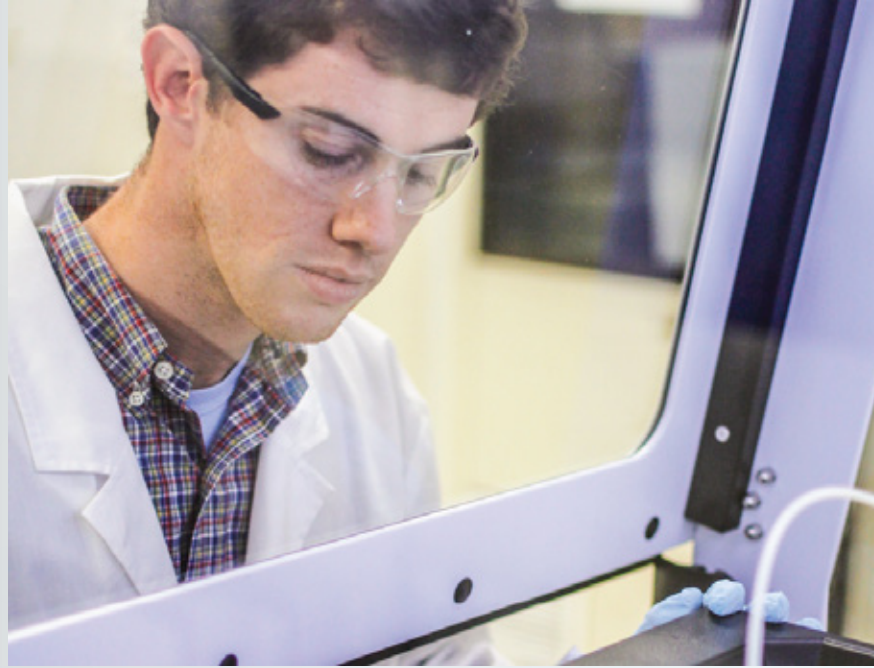






Flow Sciences' team of industrial engineers design workstations and enclosures that reduce product contamination and maximize protection for professionals who work with toxic substances and uncertain risks. All of our products are engineered and manufactured at our corporate headquarters in Leland, NC and are backed by our sophisticated design process and award-winning excellence in engineering, including 11 U.S. Government patents. We have worked with pharmaceutical companies, research and development laboratories, manufacturing, and production facilities for 30 years. Our task-specific designs are dynamic solutions that are adaptable to our clients' workflow and specific needs.

Flow Sciences was one of the first companies in the U.S. to use computational fluid dynamics (CFD) in drafting our enclosures to ensure optimum airflow. Our engineers use CFD algorithms to simulate fluid flows and interactions within contained spaces. This enables us to predict and control airflow through design, which we then test in our state-of-the-art laboratory. Working closely with our clients to mimic real-world applications, we develop testing protocols based on the intended use of our enclosures and measure them against industry-accepted standards to ensure proper containment. We have designed, manufactured, and tested over 14,000 enclosures, generating a wealth of data on situational flow dynamics, which allows us to control for consistency, safety, efficacy, and overall quality.



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