

BELLOWS PRECISION CLEANING SERVICES

Designed for Metal Bellows, Tubing & Assemblies

Duraflex, Inc.'s **Metal Bellows Precision Cleaning Services** are revolutionizing the industry through innovative engineering approaches & creating single source solutions for our customers. Our high tech cleaning services are managed by an experienced team of professionals following stringent procedures upheld by AS9100D/ISO 9001:2015 standards.

Introduction

The most common reason customers request cleaning of bellows, tubing & associated assemblies is due to "spec requirements". However, the key motivation for "why" is often overlooked. Cleanliness prevents unwanted foreign object debris (FOD) from entering into a system where it may be potentially harmful to people, products, performance & the process.

To some extent, virtually everything we touch has particulates present with a potential to contaminate a product or process. The object of cleaning "specifications" is to identify how to clean an item & what is necessary to validate that an item or system is cleaned to the certification level or standard mandated by that industry.

Duraflex, Inc. **Precision Cleaning Services** are performed in a controlled environment.

Types of contaminants include unwanted matter such as particles, shavings, fibers, chemicals, oils and/or greases that can only be visualized at a microscopic level. Our clean rooms/work spaces are pre-cleaned & maintained under quantitatively controlled conditions creating a very low to negligible chance of particle contamination within the room or onto the products being cleaned & tested.

Duraflex, Inc. **Precision Cleaning Steps** are approached carefully, every time!

The 1st step in the precision cleaning process is to **identify** the cleaning system & agents that are most effective, but are not harmful to the parts or its application. The 2nd step is **validating** the completed cleaning was successfully completed to the required specifications. The 3rd & final step is to ensure the cleaning is lasting & protected from future contamination in the form of utilizing proper sealing & packaging methods.

Definitions

Dew Point Measurement Establishes the point at which of moisture would condense on the surface of the metal allowing it to still resist final cleaning & drying.

Effective Drying Process Accomplished with a combination of vacuum & heat, this process assures the cleaning technician that the workpiece is essentially free from the cleaning solution applied to extract the unwanted contamination.

Non-Volatile Residue (NVR) Measurement of residues, mostly oils & greases, which remain on the cleaned surface or in the solution used to dislodge particles/particulates from the workpiece.

Particle / Particulate Count Measure of the number & sizes of particles or particulates remaining on the surface of a collection device, solution used to dislodge particles/particulates, or in the effluent itself.

Total Filterable Solids (TFS) Resultant mass of unwanted solids when a virgin filter is first weighed & then weighed again after the dirty particles/particulates have been captured & weighed again in total with the filtering device.

DURAFLEX, INC. ADVANTAGES

AS9100D |
ISO 9001:2015

- Standard Products In-stock
- AS9100D | ISO 9001:2015
- Custom Orders Available
- Cost Competitive...always!
- No Minimums

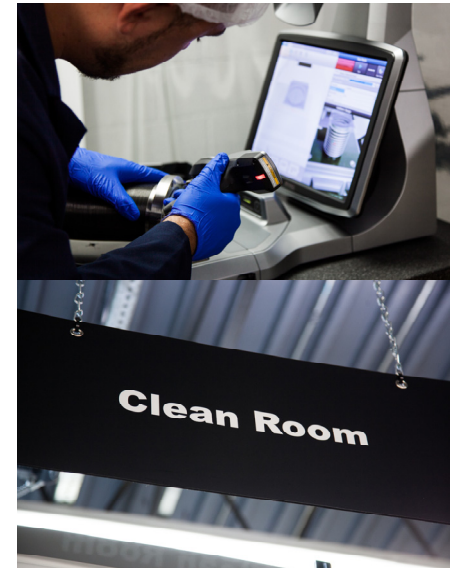
- Professional Appearance
- Short Lead Times
- Engineered Drawings
- American Made
- American Materials



BELLOWS PRECISION CLEANING SERVICES

Critical Markets | Industries, Products & Applications

AEROSPACE	OPTICS	SEMICONDUCTOR	R&D
Accumulators, Actuators, Cryogenic, Flex, Fuel, LOX lines, Valves, Volume Compensators, Tubing, Launch, Support, Breathing Devices	Telescopes, Adjustment Devices, Linear Actuators, Flex & Rigid Tubing	Lifting Mechanisms, Isolation Devices, Flex Tubing	<ul style="list-style-type: none"> Physics: Beam Alignment, Flex Lines, Connectors Biochemistry: Extraction, Isolation Devices Space Exploration: Volume Compensators, Valves, Fuel & Cryogenic Lines, Flex & Rigid Tubing Chemistry: Connectors Nano: Flex Tubing Microbiology: Bellows Isolation Systems
AIRCRAFT	MEDICAL	UHV	
Ducting, Vibration Dampers, Instrumentation, Flex & Rigid Tubing	Heat Exchangers, Pumps, Ventilation & Supply Lines, Actuators, Flex & Rigid Tubing	Vacuum Feedthroughs, Etching Equipment, Specialized Deposition Devices	
ELECTRONICS	PHARMA		
Sensors	Vacuum, Cryogenic, Furnace Devices		



Why Duraflex, Inc.?

- Private Company
- Faster, Less Expensive, Diligent
- Procedures, Protocols, Documentation
- Clean Room Electronic Monitoring
- Recorded Minute-to-Minute Particle Count
- 40+ years Clean Room Experience
- Diverse Industry Cleaning Capabilities
- Centrally Located in Midwest

Duraflex, Inc. will clean and/or test all competitors bellows & tubing.



Equipment | Accessories

- Certified: IED Class 5- 100, Class 6- 1000 & 10,000 clean room environments available
- Laminar Lighted Flow Bench & Hood
- Down Draft Rough Cleaning Areas
- Optical Particle Counter
- Ultrasonic Cleaning (multi-wave form, with heating)
- Micro to XL Assemblies (we have equipment to match all sizes & types)
- Isolation Cleaning
- Vacuum Drying
- Vestibule Clean Room (for monitoring & final assembly, if required)

Verification | Validation

- Particle Count
- Water Break Testing
- Visual
- Digital Dew Point Meters
- Acid-Base Titration
- Wet Chromatography
- Electron Microscope
- Spectrographic Analysis
- Photoionization Detection Equipment
- Dryness Verification Techniques
- Acid-alkaline Sensors / Indicators
- Laboratory NVR Equipment / Accessories
- Gravimetric NVR Systems
- Total Filterable Solids (TFS)
- Filtration & Collection Systems
- Final Documentation / Certification on all

Specifications | Compliance

- ISO 9001-2015
- AS9100D
- IEST 1246 D Level 50A to
- IEST 1246 Levels A/10 & A/20
- GMP & 6S Compliant
- ASTM: F-311, F-312, F-331
- ASTM A967-13: Practices D, E, F
- IEST CC 1246 D
- Multitude of Aerospace, Military & Defense Specs

Packaging Techniques | Materials

- Meet / Exceed all High Level Standards
- Experienced Handling to preclude damage & material-to-part contamination
- Upon request, include utilization/handling instructions to maintain cleanliness
- Pre-cleaned/Tested prior to use in accordance with specs (not limited to):
 - VC1, VC2 Barriers
 - Nylon
 - Shock Absorption Barriers & Indicators
 - Polyethylene Film
 - Desiccant
 - Anti-Static Barriers
 - Aclar®

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