



BELLOWS DESIGN

Duraflex, Inc.'s **Bellows Designs** are revolutionizing the industry through innovative engineering approaches & creating single source solutions for our customers. Our bellows are engineered for confidence & designed to perform.



Duraflex, Inc. Bellows Designs Offer:

- 3D Modeling
- 2D Drawings
- 3D Printing

BELLOWS FEA (Finite Element Analysis)

EJMA (Expansion Joint Manufacturers Association) provides predictive models for comparing cycle life. Due to:

- Operating inputs such as temperature, pressure, motion
- A selection of materials, thickness & number of plies, geometric & dimensional changes are used to optimize design.

BELLOWS FEA (SOLIDWORKS Simulation Premium)

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| <ul style="list-style-type: none"> ● Acceleration Loading ● Dynamic & Combined Loading ● Exhibits Response to Static & Dynamic Inputs ● Fatigue Analysis ● Linear/Non-Linear Response | <ul style="list-style-type: none"> ● Provides Detailed and Combined Stress Analyses ● Structural Optimization ● Tests Product Performance Prior to Production ● Vibration Response |
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ALL OF THE ABOVE ALLOWS FOR DESIGN & PERFORMANCE OPTIMIZATION

- By Focusing on Innovation
- Creates Collaboration with Customers
- Faster Designs Leads = Faster Prototypes = Predictable Production
- Promotes Testing as a Validation & Verification Process
- Test & Modify Designs Before Building Prototypes
- Visualize & Create Intuitive 3D Designs



BELLOWS FLOW ANALYSIS (SOLIDWORKS Flow Simulation)

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| <ul style="list-style-type: none"> ● Allows Duraflex, Inc. to Perform CFD
<i>(Computational Fluid Dynamics)</i> ● Fluid Analyses ● Fluid Dynamics | <ul style="list-style-type: none"> ● Pressure Drop Analyses ● Provides Heat Transfer Analyses ● Transit Flow Analyses |
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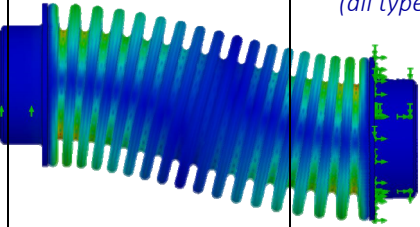
DURAFLEX, INC. ADVANTAGES



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| <ul style="list-style-type: none"> ■ Standard Products In-stock ■ AS9100D ISO 9001:2015 ■ Custom Orders Available ■ Cost Competitive...always! ■ No Minimums | <ul style="list-style-type: none"> ■ Professional Appearance ■ Short Lead Times ■ Engineered Drawings ■ American Made ■ American Materials |
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BELLOWS TESTING

CORROSION ANALYSIS	PHYSICAL FLOW TESTING	PMI <i>Positive Material ID</i>	TEMPERATURE TESTING
<ul style="list-style-type: none"> • Intergranular • Pitting • Rusting • Stress • Surface Oxidation 	<ul style="list-style-type: none"> • Per Customer Requirements • Per EPA 	<ul style="list-style-type: none"> • Our Process uses X-ray Diffraction • Verifies MTRS & Chemistry of any Material 	<ul style="list-style-type: none"> • Internal to External Skin • With/Without Motion & Pressure • Performance Validation/ Verification
CYCLE LIFE	LEAK TESTING	PRESSURE TESTING	VIBRATION TESTING
<ul style="list-style-type: none"> • Installed or Neutral Position • Pressure • Temperature 	<ul style="list-style-type: none"> • Air Under Water • Locational • Helium Mass Spec to 1×10^{-12} cc/sec² • Post Failure Detection • Pressure Decay • Pressure Testing (<i>all types</i>) 	<ul style="list-style-type: none"> • Burst • Decay-Drop vs. Time • Proof • External/Internal 	<ul style="list-style-type: none"> • Per Customer Requirement • Random Vibe • Verify Bellows Natural Frequency (<i>as established by FEA</i>)
DIMENSIONAL 1 ST ARTICLE (AS9102)		SPRING VACUUM RATE TESTING	WELD ANALYSIS
		<ul style="list-style-type: none"> • Angular • Axial • Combined • Lateral • Torsional 	<ul style="list-style-type: none"> • Metallurgical/Metallographic Analysis of every Weld • NDT (<i>Non-destructive Testing</i>) • Pull Testing • Tear Testing • Visual Examination • X-ray

WHY TEST?

- Competitive Analysis
- Eliminate Inefficiencies - Test Prior to Production
- Simulate Product Performance - Use Various Conditions
- Examine Design Iteration Effects
- Gain Physical Understanding of Products Behavior
- Reveal Conditions Where Product Failures May Occur
- **Validation** | Reassurance that Products, Services, Systems Meets Needs
- **Verification** | Evaluate Products, Services, Systems Compliancy *With regulatory, specifications, imposed conditions - usually an internal process.*
- Duraflex, Inc. may identify the "Right Problem", but it's difficult to identify the "Right Solution" without Testing!

CONTACT US: 877.462.1007 | WWW.DURAFLEXINC.COM



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- No Minimums

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- Engineered Drawings
- American Made
- American Materials

