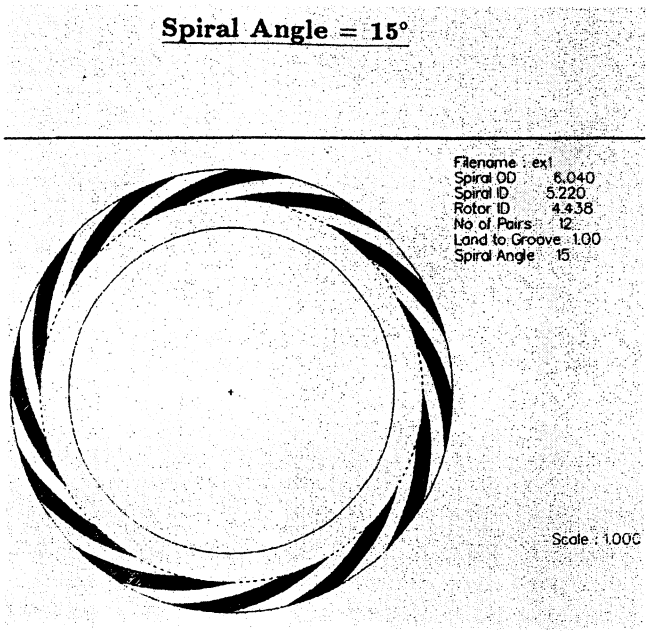
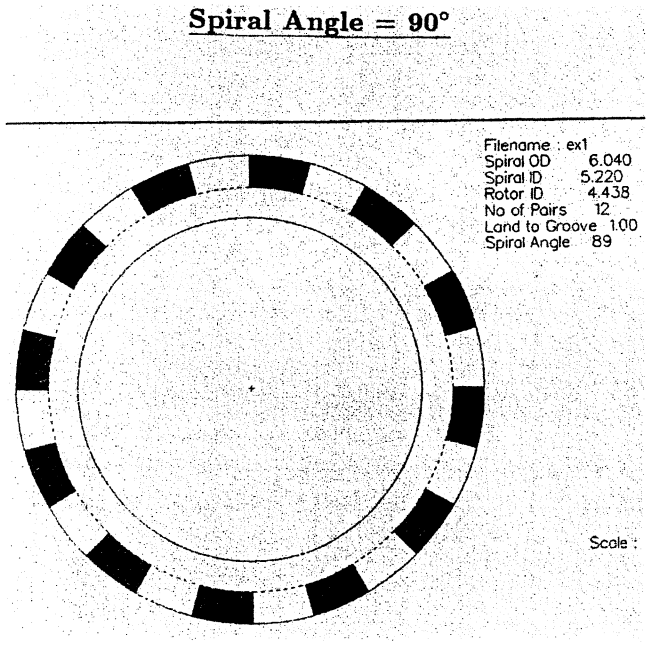
SEAL TECHNOLOGY DEVELOPMENT AT EG&G ENGINEERED PRODUCTS

Ray England
EG&G
Cranston, Rhode Island

Liftoff Geometries





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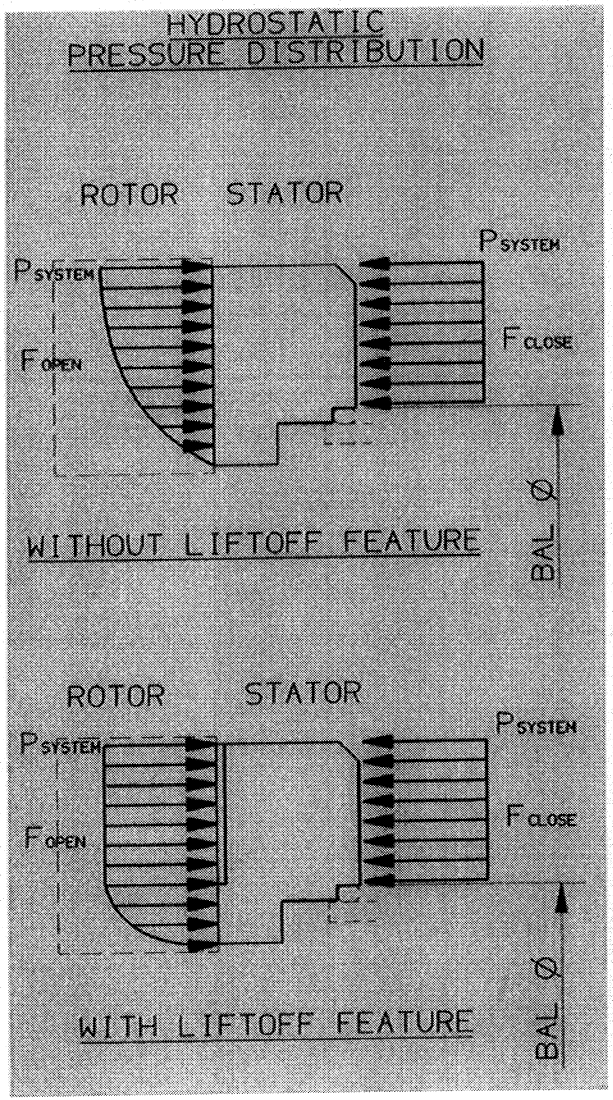
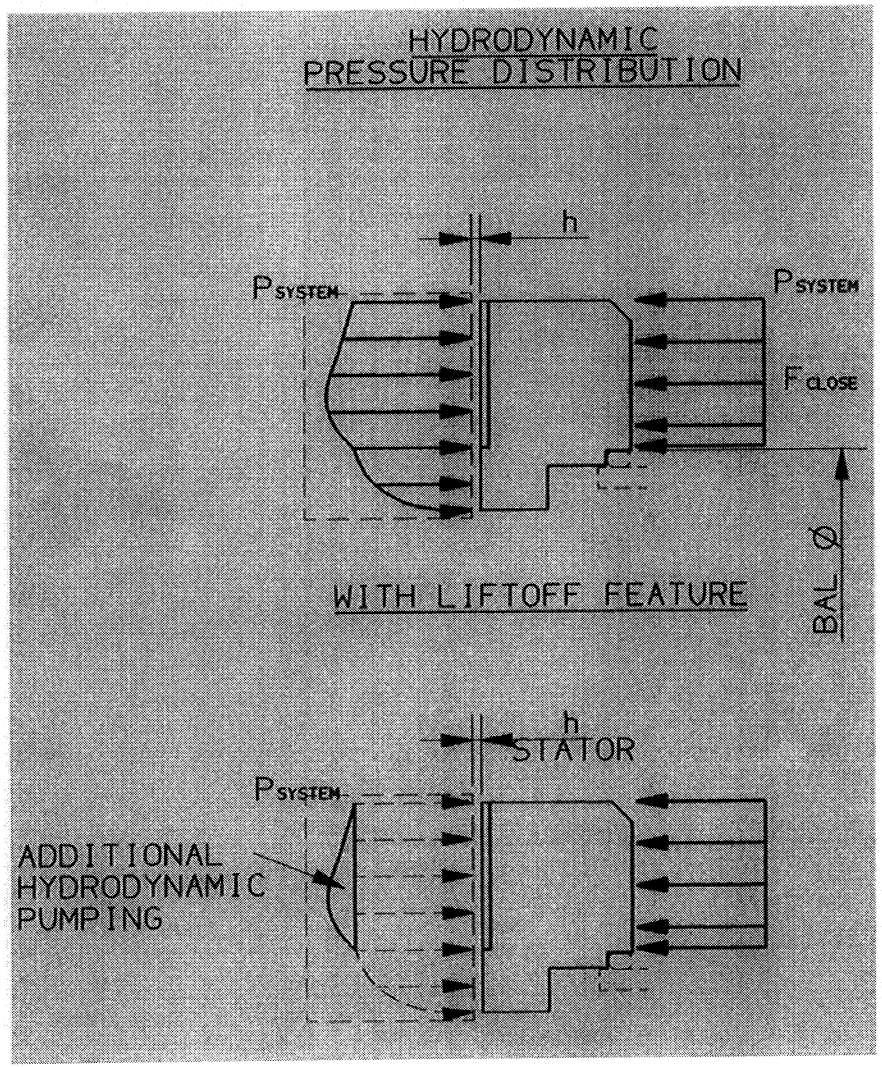
Gas Face Seal Theory





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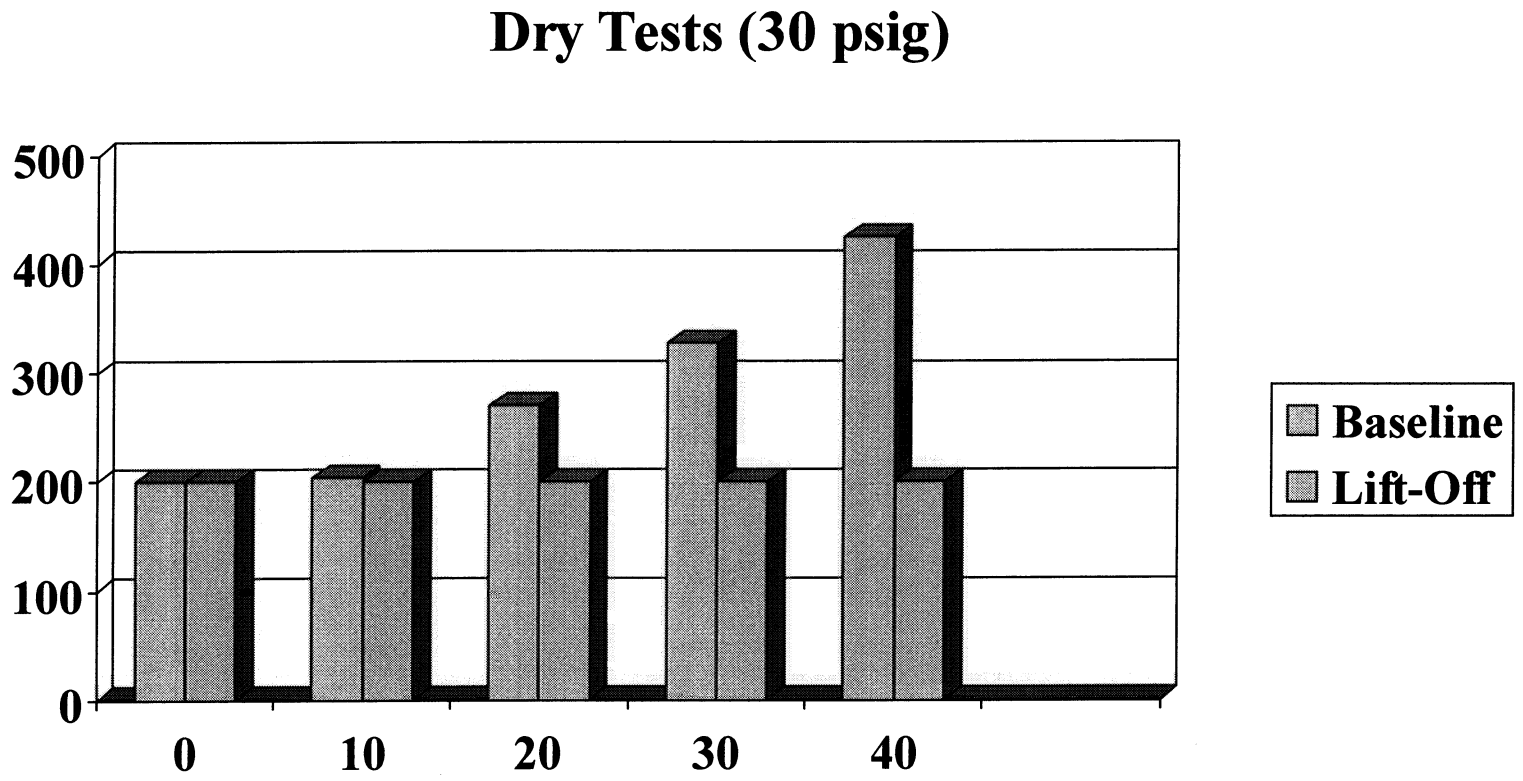
Test Results



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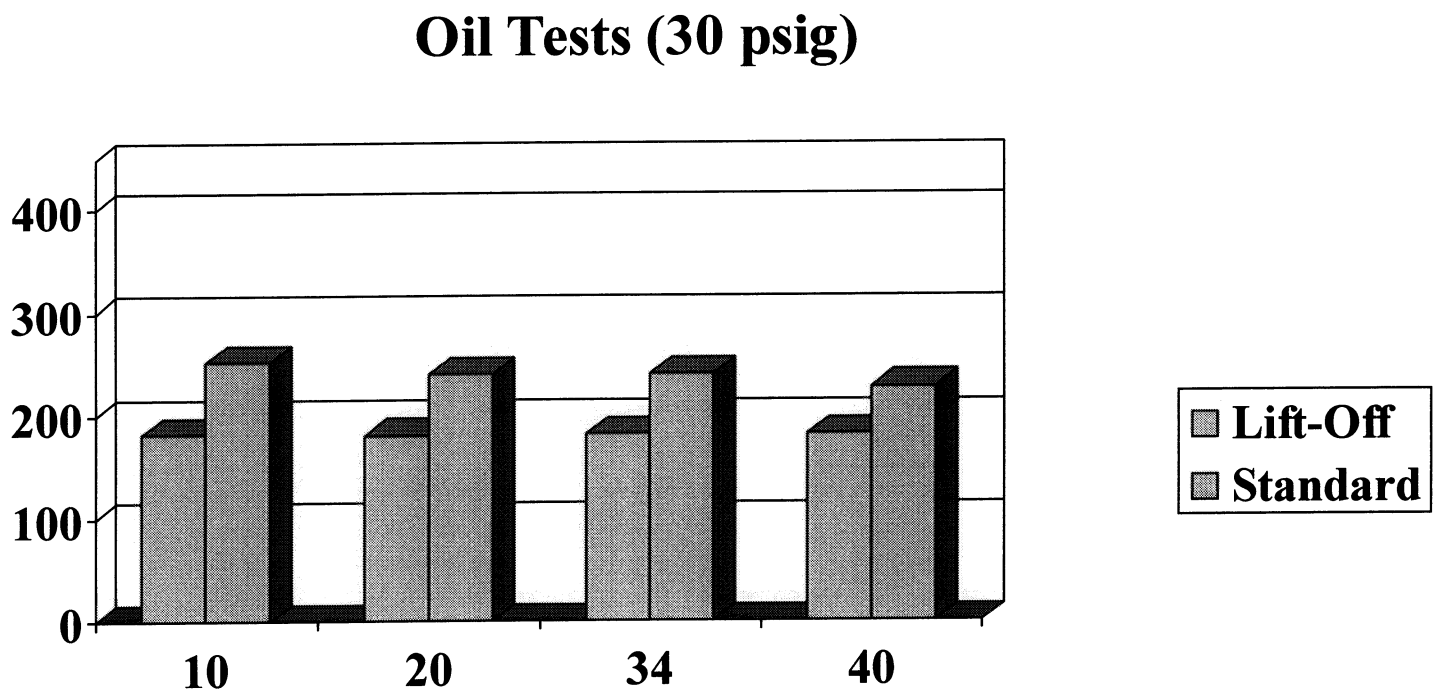
Test Results



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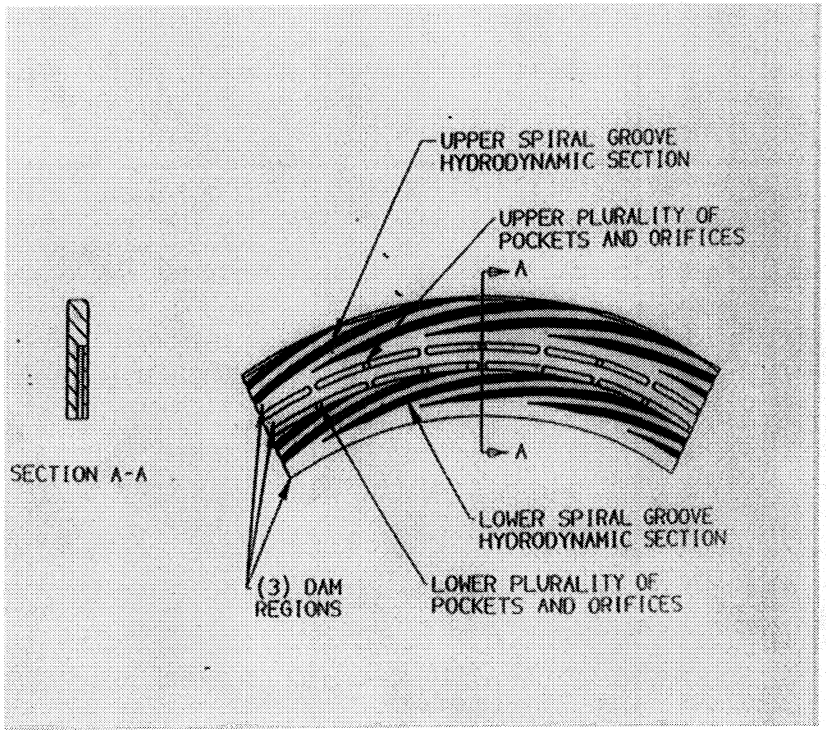
High Angular Compliance Gas Seal



- Double Spiral/Radial Groove Face Seal to Accommodate Extreme Rotor Coning
- 300 -400 psi, 500-1000 fps
- All Metallic Construction
- Compressor Discharge, Balance Piston Seal

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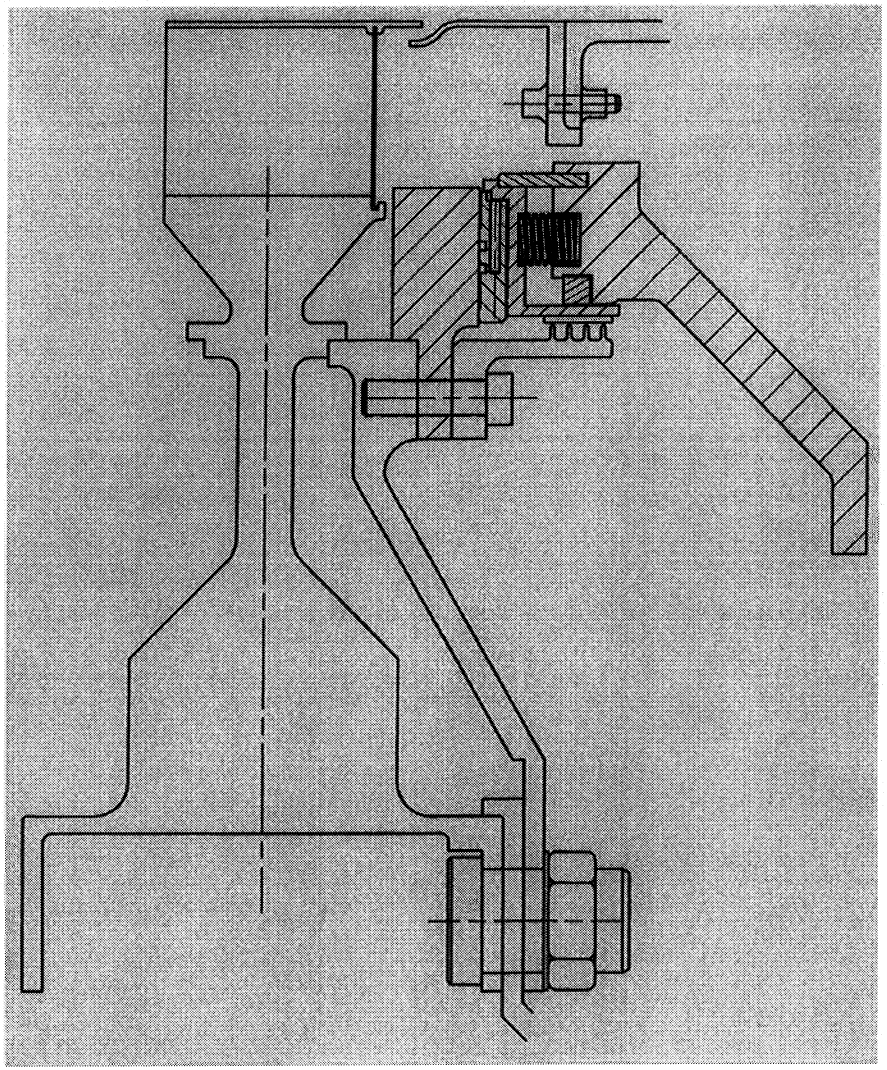

Compressor
Discharge
Application

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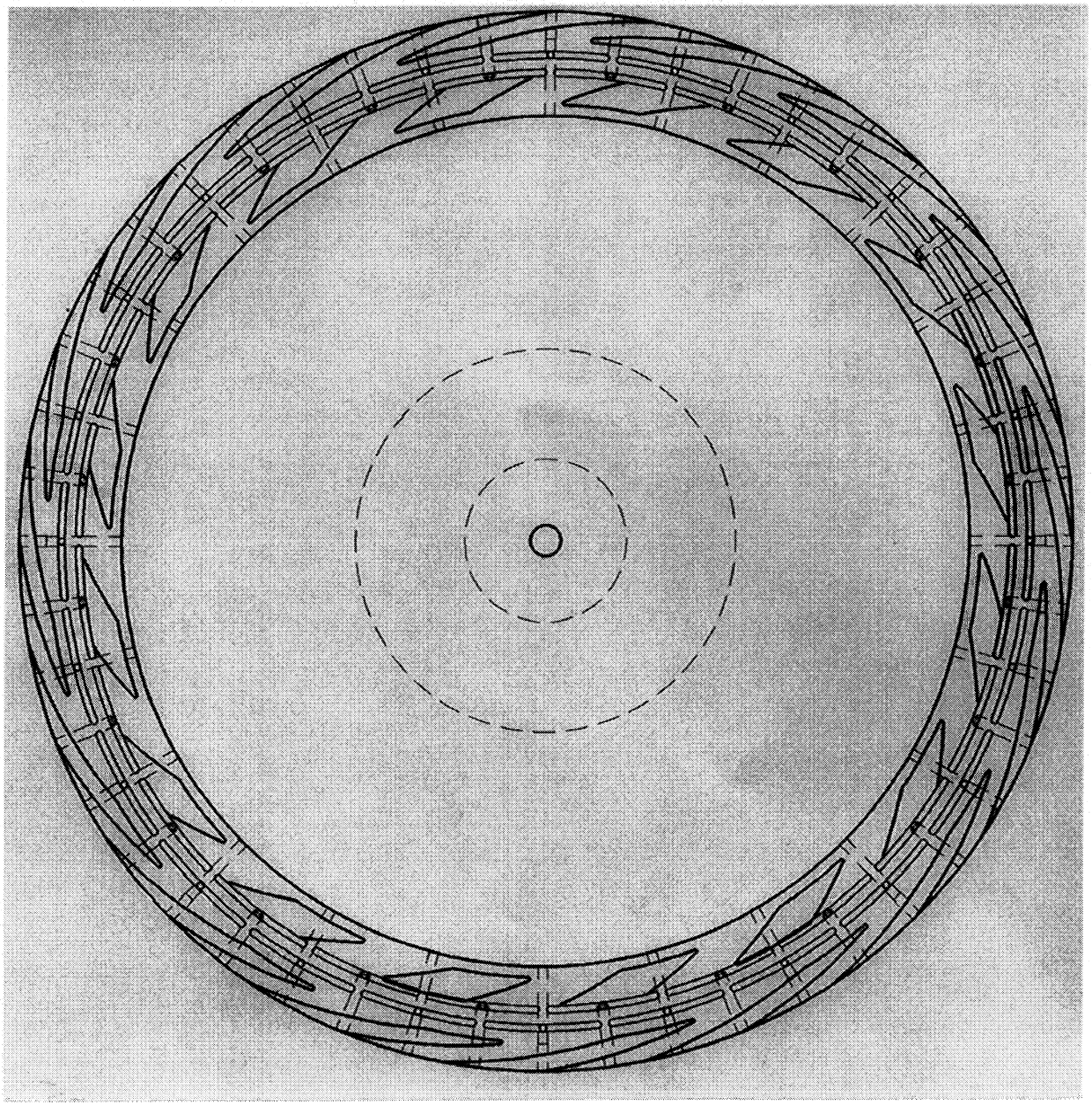

Dual Spiral Groove Geometry

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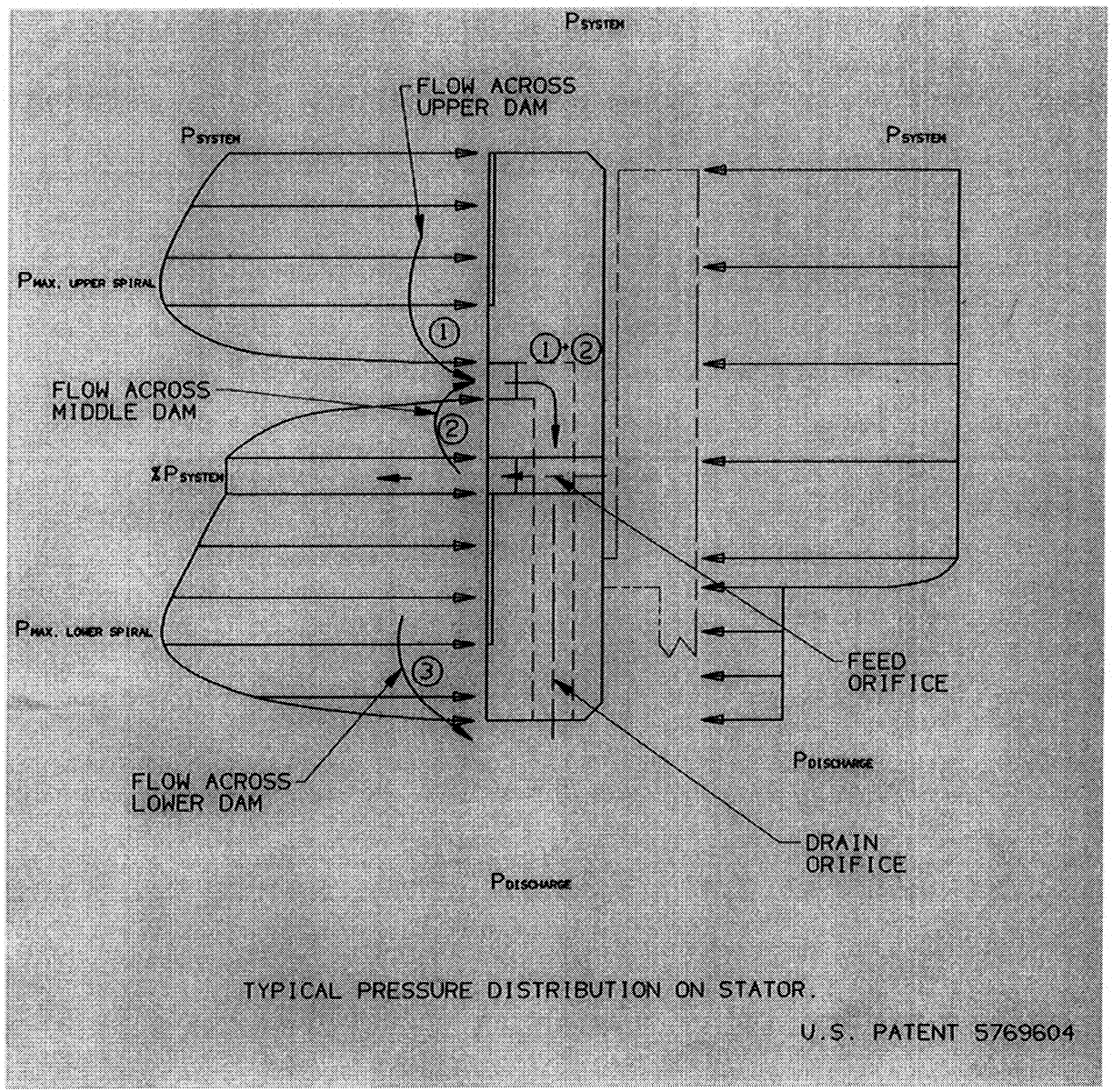
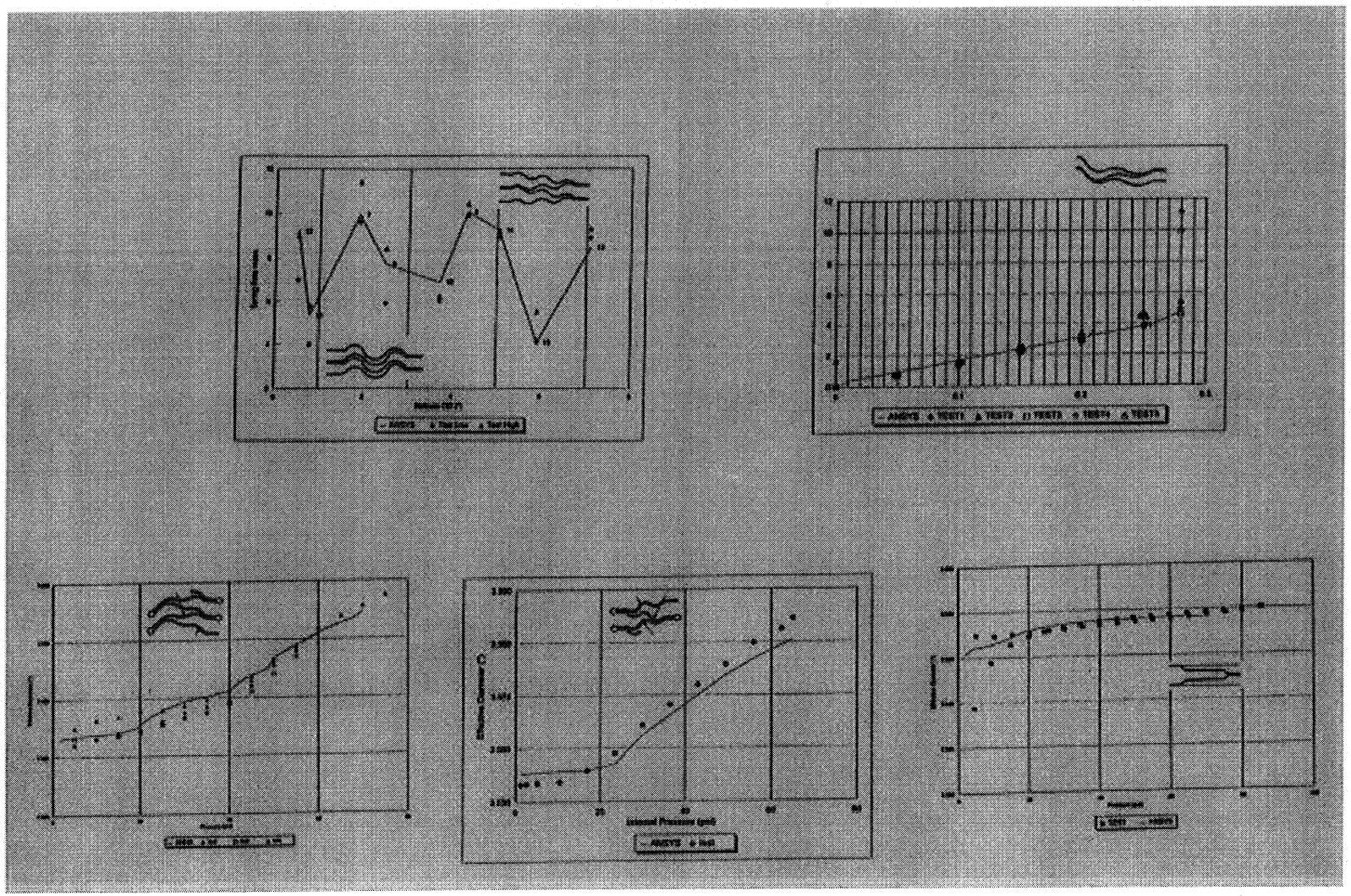


TYPICAL PRESSURE DISTRIBUTION ON STATOR.

U.S. PATENT 5769604

Mechanical Properties Prediction: Spring Rate; ED shift



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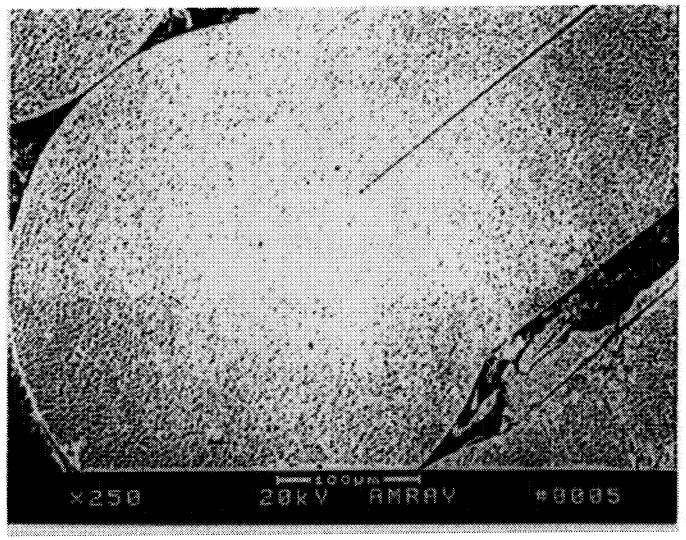
High Cycle Fatigue Design

- Prevention



- Welded Structures
- Metallurgically Nonhomogeneous
- Unheated Parent Metal
- Heat-Effected Zone
- Welded Metal (Cast)
- Sharp Notch
- Thin Shell Structures

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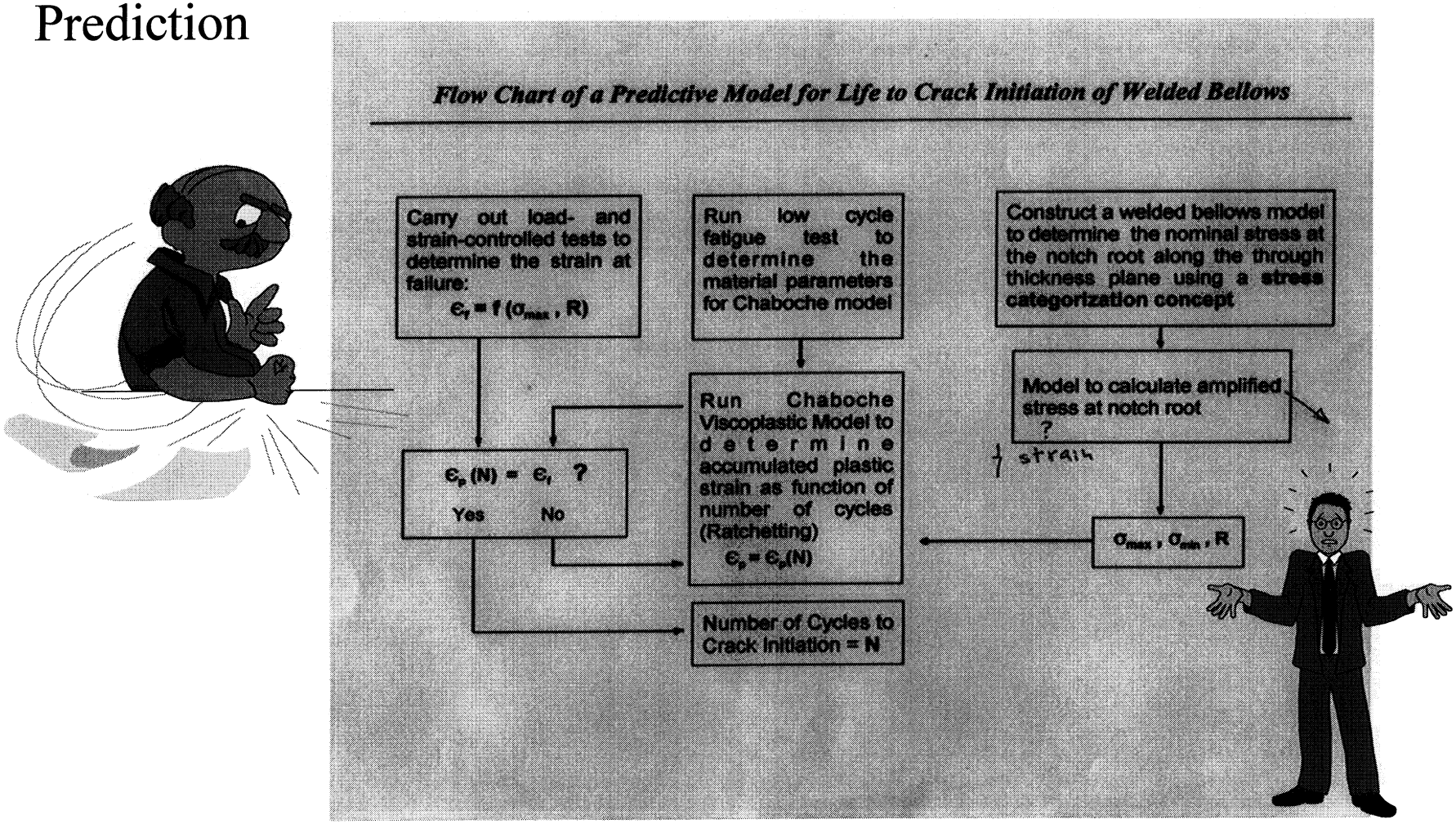
Low Cycle Fatigue Design

Prediction



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Historical Development

- Industrial Gas Seal Development Since 1987
- Radial and Spiral Groove Geometries
- In-House Fluid Mechanical Design Codes
- Seal Test Capability
- Low Pressure Medium Speed Development Since Mid-1996

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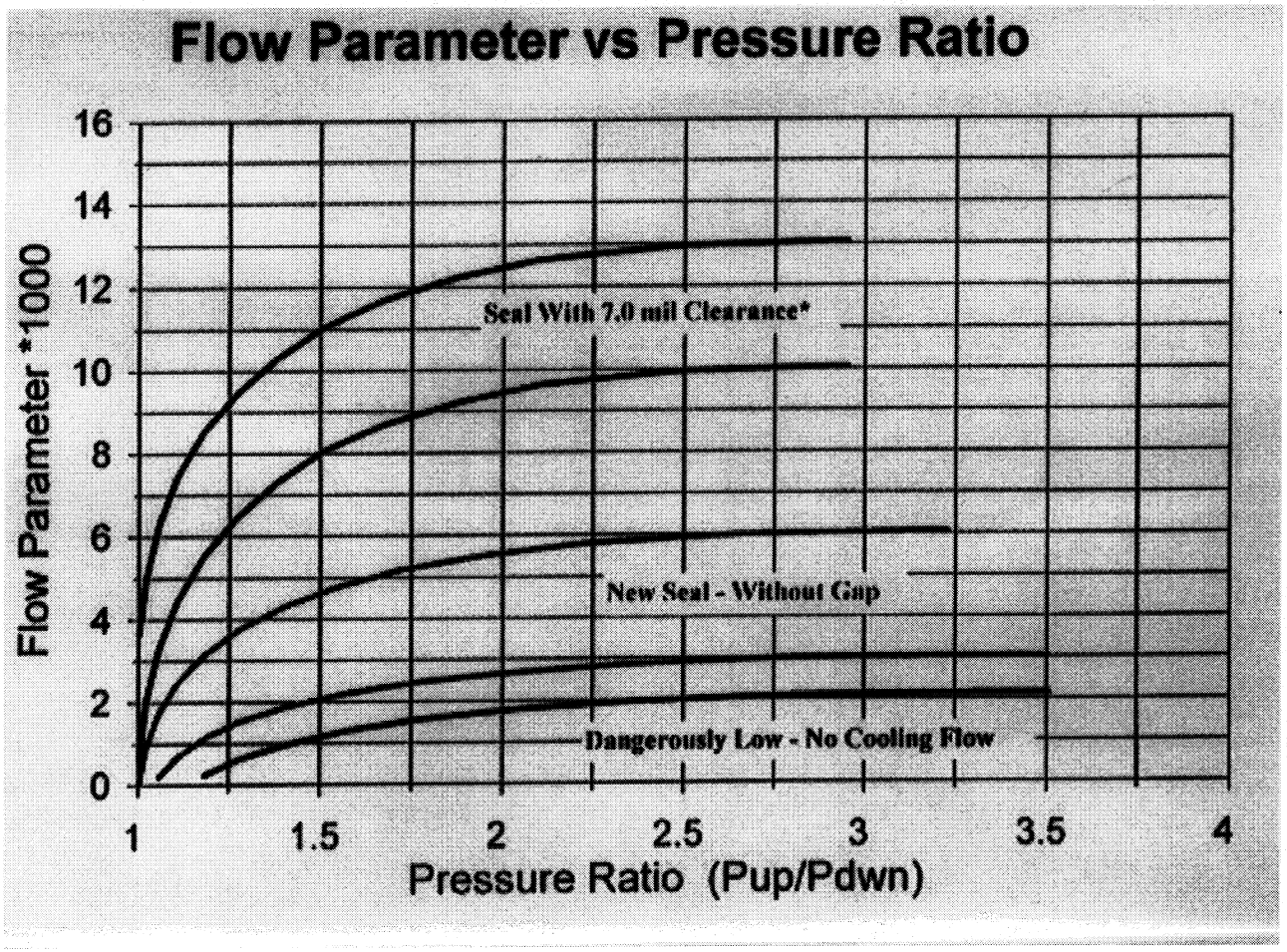
Predicted Leakage



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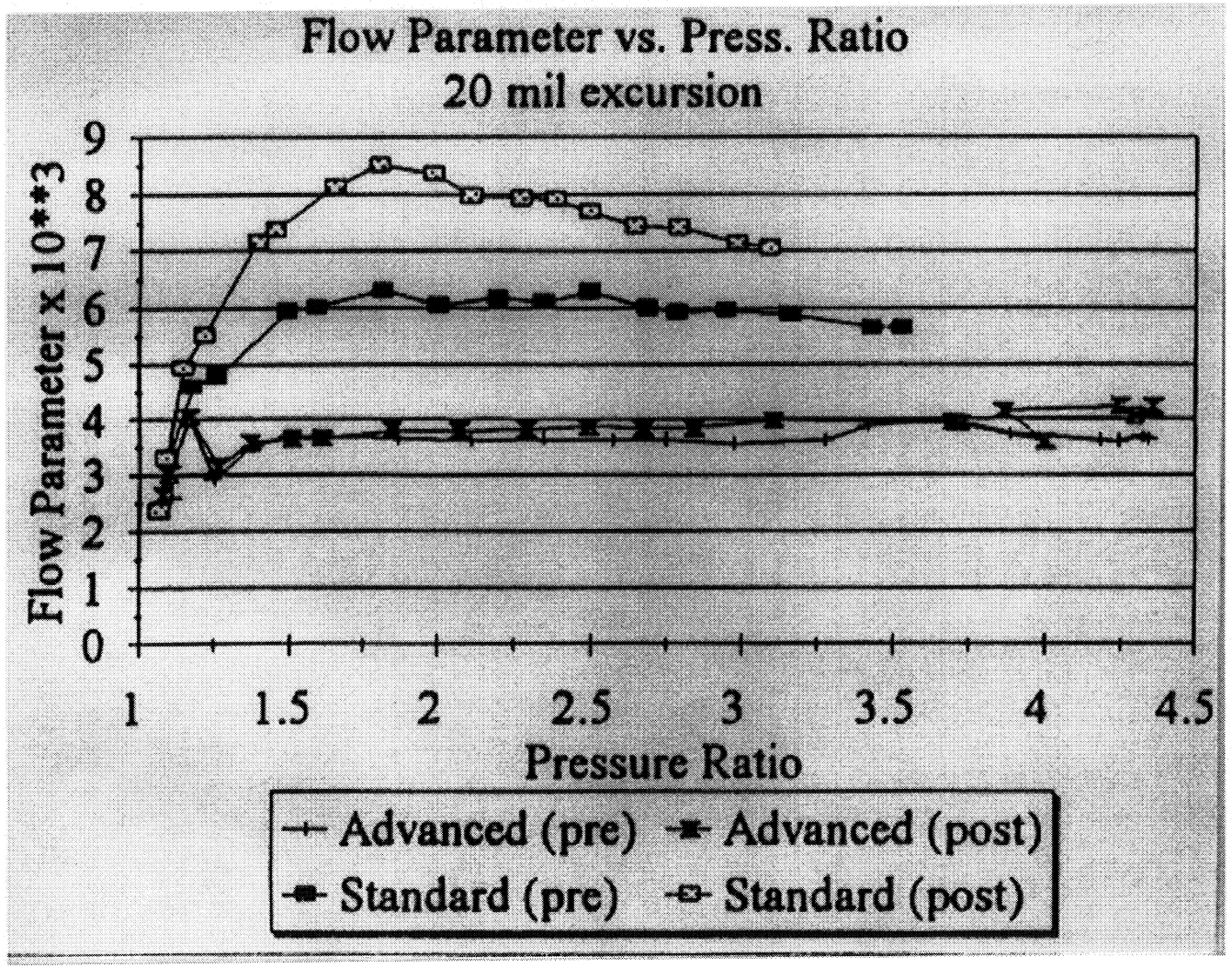
Design Comparison



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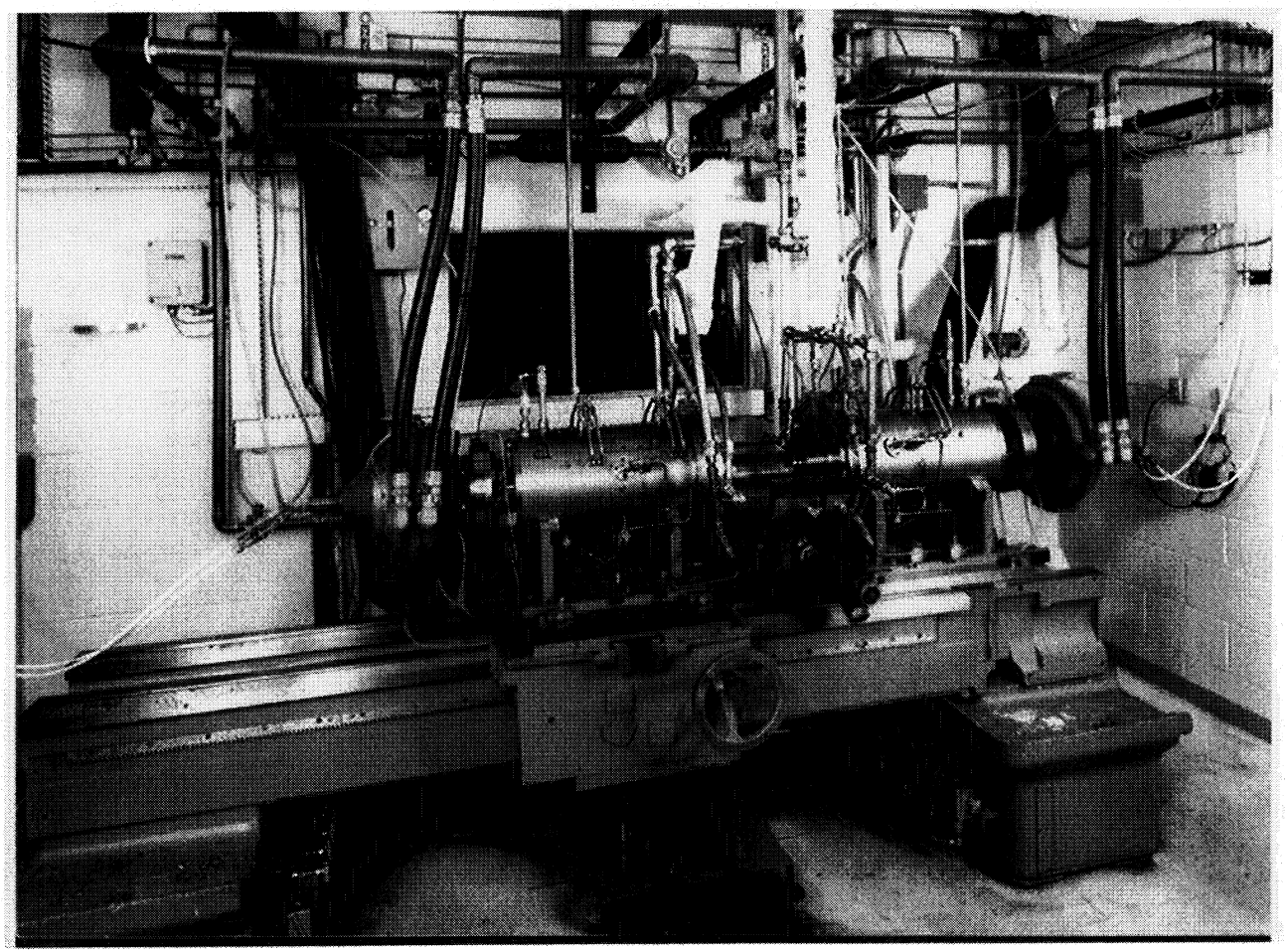
Aerospace Test Rig



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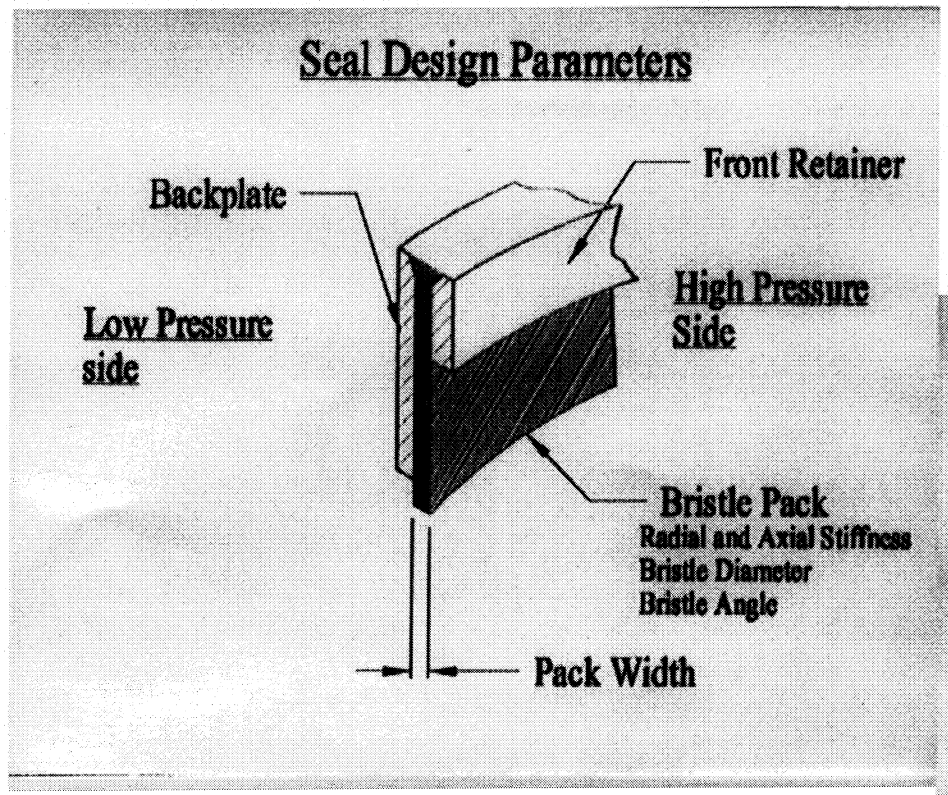
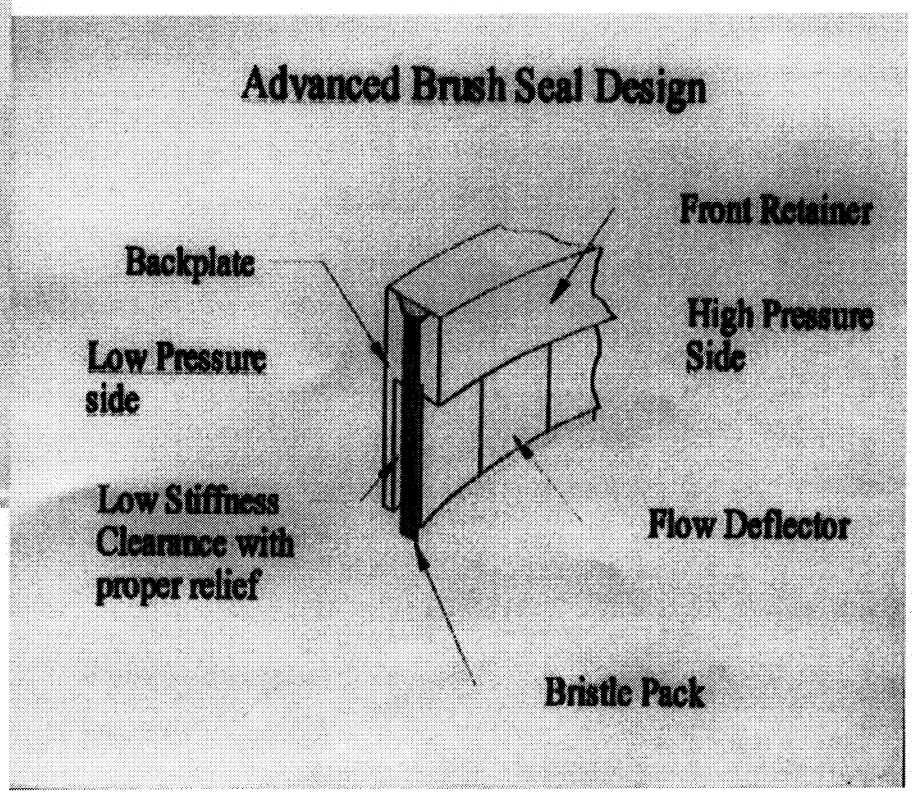
Standard and Advanced Designs





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Brush Seal Technology

- Aerospace
- Power Generation

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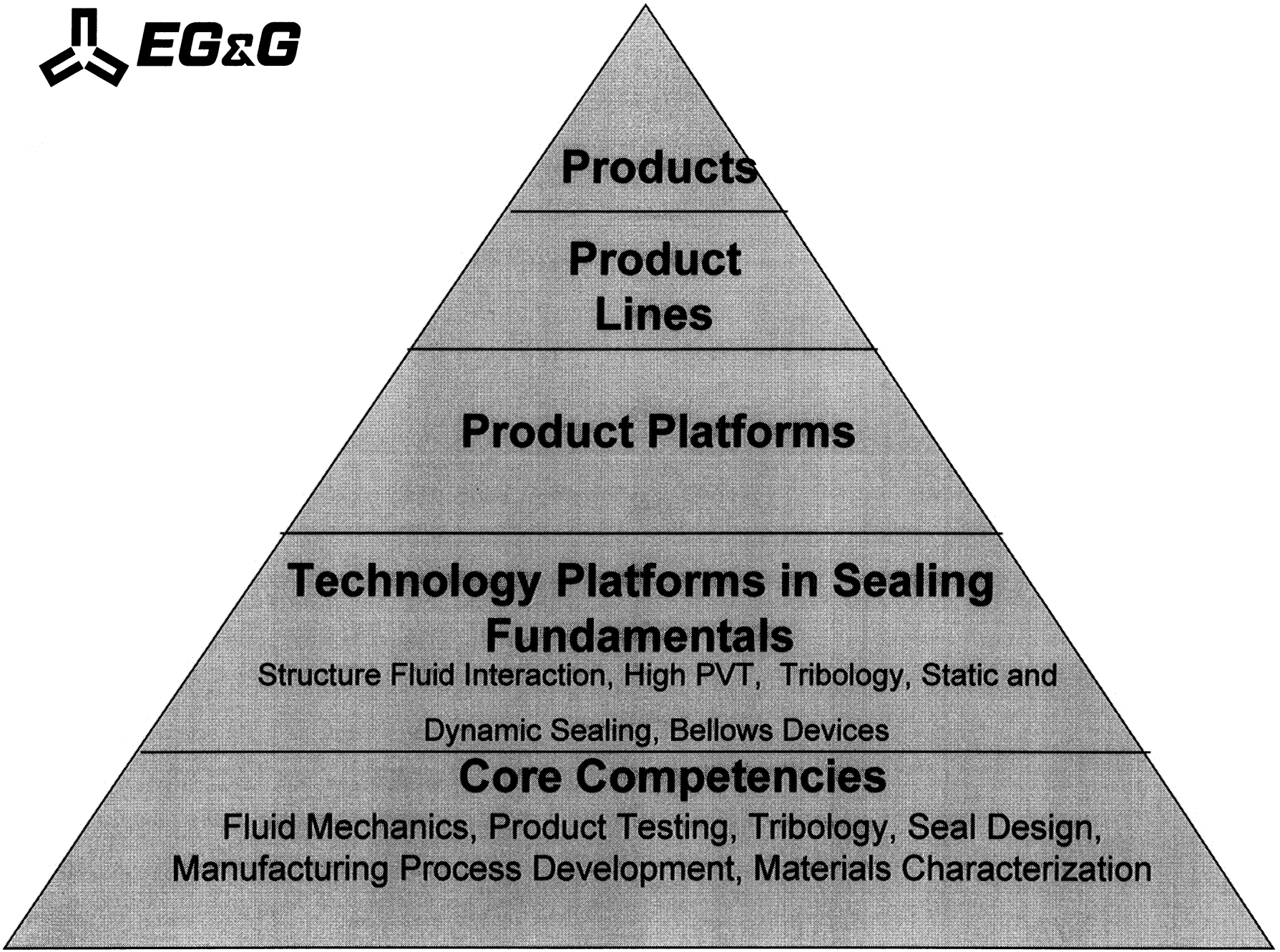
Products
Product Lines
Product Platforms
Technology Platforms in Sealing Fundamentals
Structure Fluid Interaction, High PVT, Tribology, Static and Dynamic Sealing, Bellows Devices
Core Competencies
Fluid Mechanics, Product Testing, Tribology, Seal Design, Manufacturing Process Development, Materials Characterization