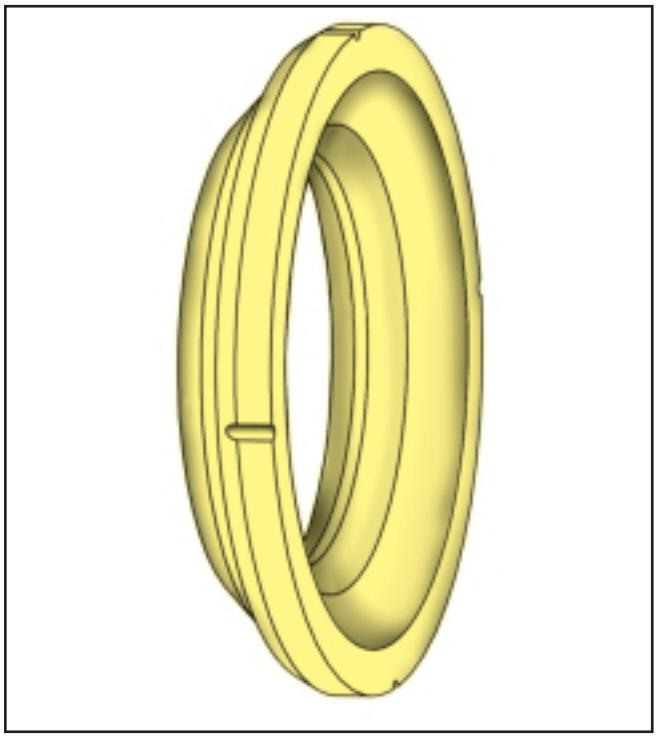
VELAN MEMORYSEAL™ BALL VALVES

PRODUCT UPDATE April, 2005

Advantages of TFM™ 1600



Velan is pleased to announce that we have embarked on a standardization program for seat material for Memoryseal Ball Valves. Typically PTFE or RPTFE are the two types of materials normally used to satisfy the majority of applications for soft-seated ball valves. However tests have shown that TFM™ 1600 material has chemical and physical qualities that exceed that of PTFE or RPTFE.

TFM™ 1600, which is classified as a homo-polymer under ISO 12086, is a modified PTFE which has a significantly lower melt viscosity giving better particle fusion during sintering, resulting in smoother surfaces and exceptional chemical and heat resistance properties.

Advantages of TFM™ 1600 include:

- Reduced cold flow
- Substantially reduced deformation under load
- Lower porosity and permeability due to denser polymer structure and lower void content
- Improved stress recovery, particularly at elevated temperatures
- Smoother surfaces
- Excellent non-stick and dielectric properties
- Higher elastic modulus
- Improved flexibility

Independent test results have concluded the following:

- Deformation under load: TFM™ 1600 4%, PTFE 10%
- Reduced void content: the better particle coalescence reduces the void content of TFM™ 1600 by a factor of almost 2:1
- Thickness sheet permeation: the coefficient of permeation of TFM™ 1600 is 40% less than that of PTFE independent of thickness

Considering that we have determined the maximum temperature rating of the TFM™ 1600 Memoryseal seat design to be 500°F (260°C), and considering that TFM™ 1600 is classified as a homo-polymer under ISO 12086, it is our intention that TFM™ 1600 can be utilized where PTFE and RPTFE seat materials are currently used. This change will facilitate stocking requirements within our own stocking program as well as our distributors' and customers' stocking programs.

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Improved Performance

and design flexibility with the processing ease of PTFE

Dyneon™ TFM™ 1600 PTFE is a modified polytetrafluoroethylene (PTFE) that maintains the exceptional chemical and heat resistance properties of conventional PTFE, but has a significantly lower melt viscosity giving better particle fusion during sintering and smoother surfaces.

Dyneon TFM 1600 PTFE is a free-flowing powder for compression molding, isostatic molding, automatic molding, and ram extrusion.

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FEATURES:

- Free-flowing resin
- Reduced melt viscosity
- Reduced cold flow
- Lower porosity and permeability
- Lower void content
- Excellent non-stick and dielectric properties
- Higher elastic modulus

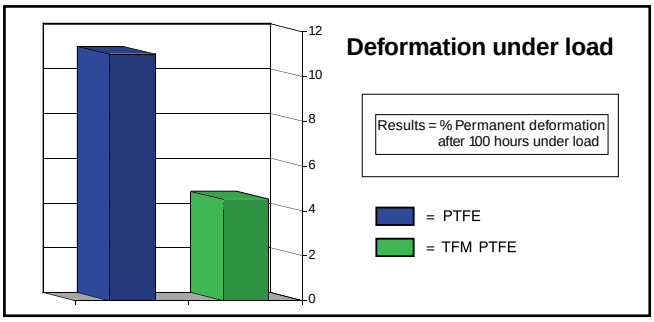
ADVANTAGES:

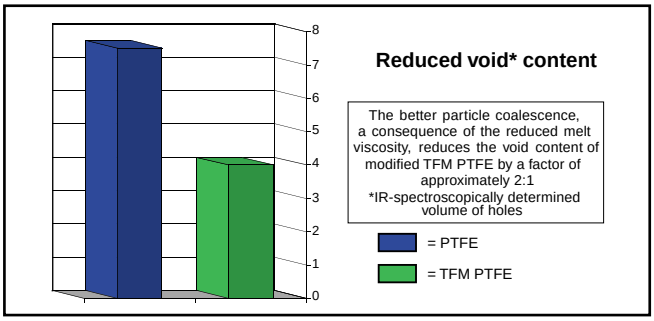
- Smoother surfaces
- Excellent weldability
- Reduced deformation under load
- Reduced extractables
- Improved design flexibility

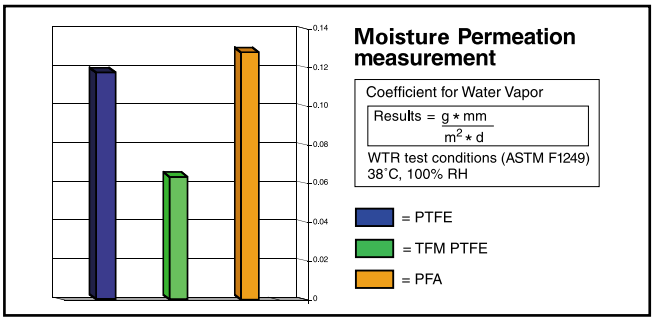
RECOMMENDED APPLICATIONS:

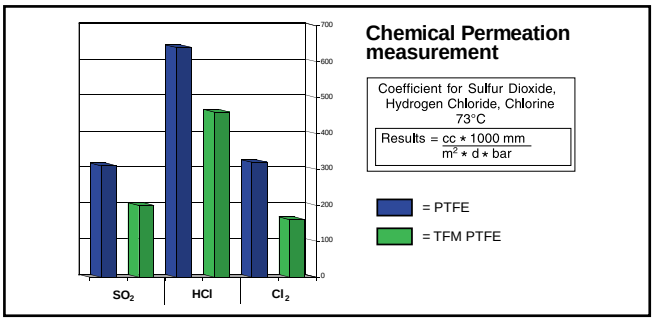
- Isostatic, automatic, compression molded or ram extruded products
- Skived film and sheet
- Envelope gaskets requiring high blowout security
- Ball-valve seats for reduced cold flow without the use of fillers
- Lining systems
- Semiconductor and chemical processing system components
- Thermoformed products: blow molded or deep drawn goods

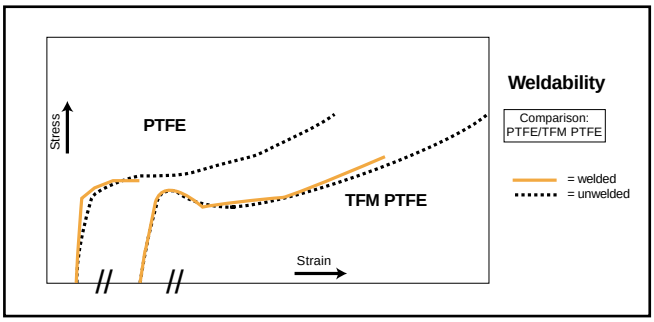
Dyneon™ TFM™ 1600 PTFE

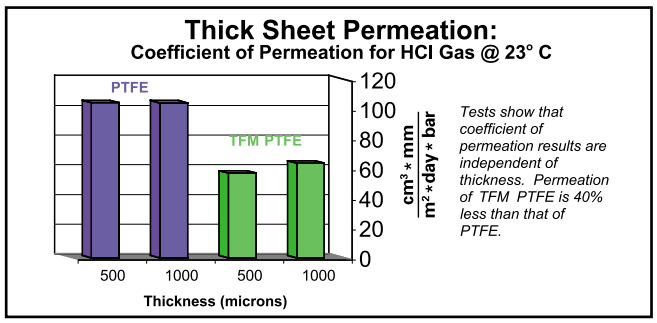




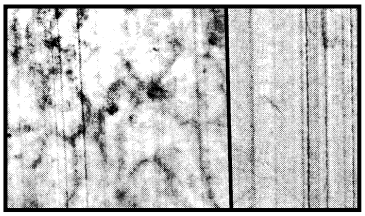








Micrographs of PTFE 100 µm skived films (50x magnification)



Left: Unmodified, conventional PTFE.

Right: Modified, TFM PTFE. The boundaries of the secondary particles have disappeared.

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Technical Information and Test Data

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