




## Gore™ Universal Pipe Gasket and its progress within CPI

Prepared for :  
Clearwater Convention 2006  
AIChE- CF Chapter  
June 9-10, 2006



By:  
C.P. Ganatra, P.E  
[cganatra@wigore.com](mailto:cganatra@wigore.com)



## Chronology Since birth of this new gasket

- It was introduced at 2004 Clearwater convention
- Product: New versatile gasket: can be used across all piping classes (Steel, FRP, Plastic and Glass), Most chemicals, full range of temperature and pressures.
  - Key attributes:
    - Highest reliability in all pipe classes as confirmed by third party reports
    - Lowest stress to seal design for sealing fragile flanges.
    - Highest creep (cold flow) resistance among all PTFE based gaskets


 



## Concept: Only one gasket required for all pipe classes






 



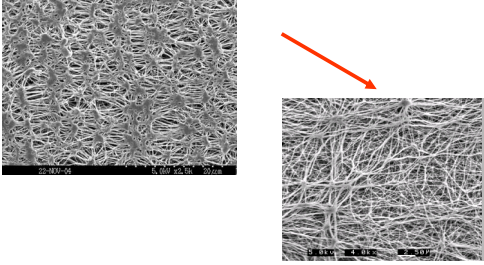
## Recap: The third party reports



- Gore spent over 18 months before launch to validate this gasket technically in the market place.
  - Key tests performed by third parties
    - ASTM 152 strength tests on this as well as most PTFE based gasket material in market place
    - Bolt load retention at 100 C for one hour
    - Creep relaxation test (Residual gasket stress at 600 F for 96 hour)
    - HOBT (Blow out reliability) test with and without Thermal cycling


 



## Advances in Membrane Technology




 

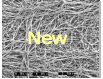


## Developing a New Universal Gasket

Latest advancement in GORE's technology



- Provides greater creep resistance
- Plus increased tensile strength

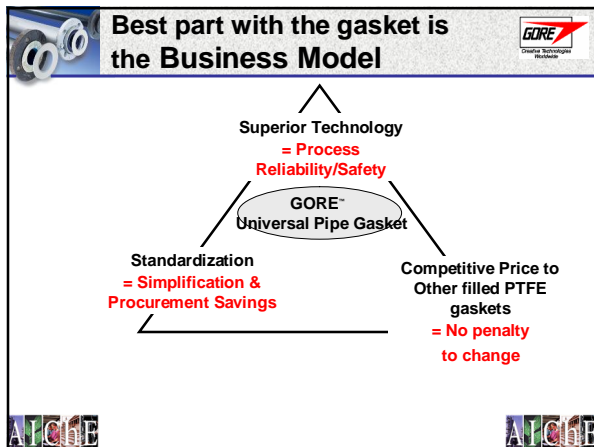
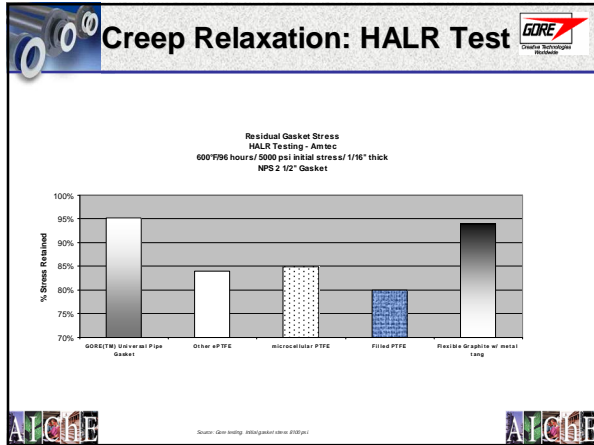
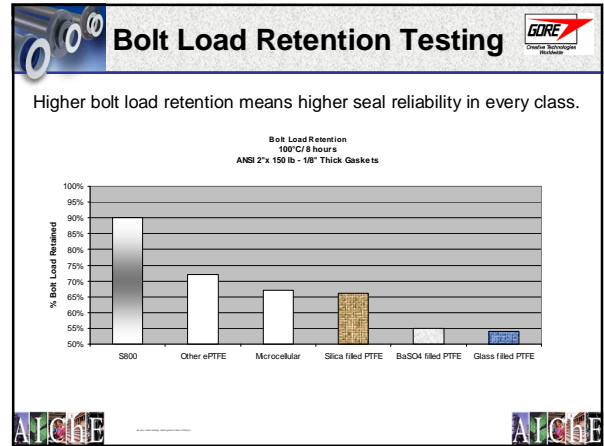
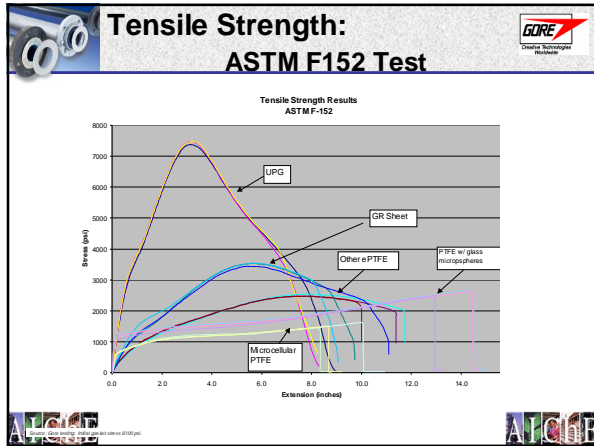
  
Previous

  
New

Resulting in ...

- Highest performing PTFE based gasket
- Highest reliability in every class
- Ability to standardize



- ### Win-win situation for everyone involved
- **Procurement:** reduced inventory, ordering and carrying costs
  - **Maintenance:** reduced risk of improper gasket selection and installation due to inadequate bolt load
  - **Process and Operations engineers:** increased system reliability & safety
  - **Management:** supports strategic & systemic cost reduction while lowering risks of gasket related process failures
  - **Engineering / Maintenance contractors:** Simplifies their supply chain and maintenance of the specifications

**Gore has strong reputation**  
in market place for high quality and new Inventions

- Gore is already selling to Chemical Industry for over 40 years the with several products.
- Gore™ Universal Pipe Gasket (Style 800) is the newest in the series, first time offered at “no penalty to change”
- Since our launch we have helped over 100 companies to standardize with this gasket and save thousands of dollars

**We will review some case studies**  
and specifications developed by CPI members

- Among the plants who have standardized (in process to date)
  - Pulp and paper plants
  - H2O2 plants
  - Caustic chlorine and ClO2 plants
  - Multi Nationals companies with various sites (Chemical and pharmaceutical industry)
  - New projects for H2SO4, including four trials in existing plants (two are discussed here)
  - Herbicide pesticide mfrs
  - Over 30 small and medium chemical companies handling acids, alkali, and organic solvents of different types

# Case Studies

**Specialty Chemicals Plant in North East**

**Plant -Gasket Inventory**

- October '04 gasket count found 256 gaskets in the maintenance shop
- These gaskets were fabricated from 21 different materials

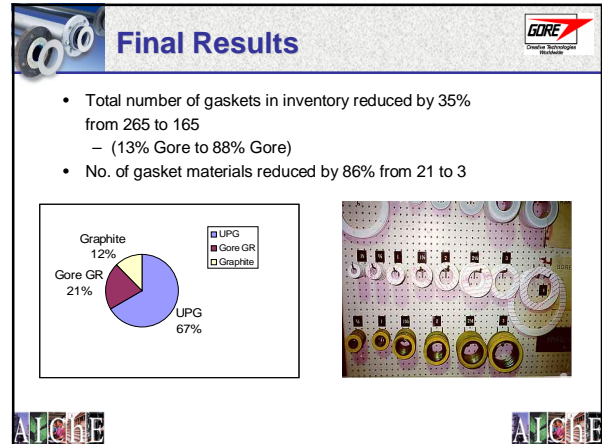
**21 Gasket Materials**  
Currently in Plant Inventory  
(13% Gore)

**Proposed Material Standardization**  
Allows for Inventory Consolidation:

Flange Size	Current Material	Proposed Material	Ring or Full Face	Unit Count	Total Count	Req'd Count
3/4" 150#	TFE Envelope	GORE UPG	FF	2	2	5
1.0" 150#	TFE	GORE UPG	FF	6	6	5
1.5" 150#	TFE	GORE UPG	FF	17	17	5
"	TFE Envelope	GORE UPG	FF	1	19	5
"	Green	GORE UPG	FF	1		
2" FF 150#	TFE	GORE UPG	FF	21	21	5
3" FF 150#	Green	GORE UPG	FF	6	26	5
"	TFE	GORE UPG	FF	20		
3" 300#	3645	GORE UPG	FF	2	2	5
4" FF 150#	TFE	GORE UPG	FF	15	24	5
"	Green	GORE UPG	FF	9		
Custom Cut	Graphite	Graphite	FF	3	3	5
5" 150#	Red Rubber	GORE UPG	FF	1	1	5
6" 150#	Black Rubber	GORE UPG	FF	1		
"	TFE	GORE UPG	FF	3	5	5
"	Klinger C4401	GORE UPG	FF	1		
Custom Cut	Klinger C6400	GORE GR	FF	1	1	5
8" 150#	Garlock 706	GORE UPG	FF	1		
"	Black Rubber	GORE UPG	FF	1		
"	Green klinger C4401	GORE UPG	FF	5	8	5
8" 150#	Garlock 3500	GORE UPG	FF	1		
<b>TOTALS</b>				Original	265	Proposed 165

## Updated Inventory List

Flange Size	Proposed Material	Ring or Full Face	SAP#	SAP Material Class	Req'd Count
1/2" 150#	GORE UPG	FF	9163570	55030000	0
3/4" 150#	GORE UPG	FF	9163571	55030000	5
1" 150#	GORE UPG	FF	9163572	55030000	5
1 1/2" 150#	GORE UPG	FF	9163573	55030000	5
2" FF 150#	GORE UPG	FF	9163574	55030000	5
3" FF 150#	GORE UPG	FF	9163575	55030000	5
3" 300#	GORE UPG	FF	Need Req	55030000	5
4" FF 150#	GORE UPG	FF	9163576	55030000	5
Custom Cut	Graphite	FF			5
5" 150#	GORE UPG	FF	Need Req	55030000	5
6" 150#	GORE UPG	FF	9163577	55030000	5
<hr/>					
8" 150#	GORE UPG	R	9163589	55030000	5
10" 150#	GORE UPG	R	9163591	55030000	5
12" 150#	GORE UPG	R	9163592	55030000	5
14" 150#	GORE UPG	R	Need Req	55030000	5
24" 150#	GORE UPG	R	Need Req	55030000	5
<b>Total</b>					<b>165</b>

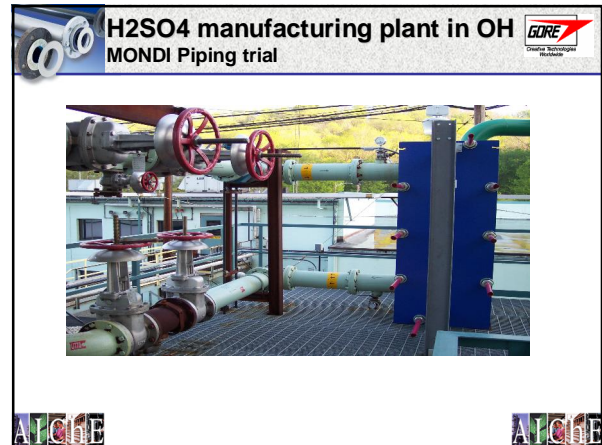


## H2SO4 Mfg plant in Ohio MONDI Piping trial

- Initial concept development**
  - New equipment (Plate and Frame HE) was being built
  - Customer was looking for a place to trial the Gore™ Universal Pipe Gasket
  - The HE connection pipes were chosen for this trial.
- Start up**
  - Twelve new 8" Old ANSI 1/8" ring gaskets were installed in Feb 2005
  - 1" Old ANSI ring gaskets were installed on Instrument connections
  - Plant commissioned HE in Feb 2005
  - UPG added to MONDI pipe
  - Gaskets are performing well so far
  - Next turn around is April 2006

Plant piping Specs:

- Continuous process
- Size- 1" to 12"
- Temp: 35 C to 65 C
- Handling 93.5 % H2SO4
- Flange Specs: Old ANSI 150 lbs



## H2SO4 Mfg plant in VA SS Piping trial

- Initial concept development**
  - New Storage tank. Had previously used Fawn gasket
  - Customer was looking for a place to trial the Gore™ Universal Pipe Gasket
  - The inlet and outlet of the tank were chosen for this trial
- Start up**
  - 12-14 gaskets were installed 12-18 months ago
  - Gaskets are performing well
  - Customer developed a new gasket code

Plant piping Specs:

- Continuous process
- Size- 1" to 3"
- Temp: 15 C to 25 C
- Handling 93- 98 % H2SO4
- Flange Specs: ANSI 150 lbs
- Pipes- Stainless Steel



**Chemical Processing Plant SE**

- Process unit conversion to GORE™ Universal Pipe Gasket

**Process pipe Spec:**  
 Continuous process  
 Size- 1" to 8"  
 Handling: HCL , Organo functional Silane  
 Flange Specs: ANSI 150#  
 Piping – FRP & CPVC

**Chemical Processing Plant SE**

- Concerns with previous Gasket materials**
- Previous gasket materials: Skived PTFE, PTFE Envelope and Glass Filled PTFE.
- Concerns about excessive torque causing damage to fragile flanges.
- Leakage due to improper torque, very narrow window to achieve correct bolt yields for fragile flanges applications.
- Inventorying three different PTFE gaskets for fragile flange applications

**Chemical Processing Plant SE**

After the UPG S800 Gasket was qualified in fragile flange applications the customer standardized on Universal Pipe Gasket S800.

**Feedback from the customer on the UPG conversion reveals,**

- The low stress to seal performance has reduced fragile flange damage.
- One gasket for use in all fragile flanges, reducing the types and number of gaskets inventoried.
- Exceptional creep and cold flow resistance has improved bolt load retention reducing the need to re-torque fragile flange joints.
- UPG standardization has reduced product loss due to leaks, and lowered maintenance man hours need for repairs and re-torque.

**Midwest Grain Processing Plant**

Plant conversion to GORE™ Universal Pipe Gasket

**Plant piping Specs:**  
 Continuous process  
 Size- 1" to 24"  
 Temp: 15 C to 125 C  
 Handling: Caustic, Mild Acid  
 Flange Specs: ANSI 150# & 300#  
 Piping - Stainless Steel

**Midwest Grain Processing Plant**


- Previous gasket materials: Skived PTFE and PTFE with Metal Insert.
- Experienced leakage due to continuous gasket relaxation (cold flow or creep).
- Practice was to re-torque all gaskets once system experienced a temperature cycle.
- Reliability Engineer stated: **"we do not have the manpower or discipline to re-torque gaskets".**
- Study was performed to justify higher cost gaskets (UPG) vs. the cost of re-torquing gaskets: Significant reduction in labor costs
- Increased overall production.
- Plant is now seeing significant bolt-load retention with little need to re-torque gaskets resulting in lower overall maintenance costs!

~~Re-Torque~~

**Midwest Grain Processing Plant**

No Re-torque

- Reduced Labor Costs!
- Increased Production!



**Thank You**

Questions?

