



**Emissions
Reduction
Technology
Forum**

Setting the Standard for Automation™

**11th LDAR Symposium
May 18-19, 2011
New Orleans, LA**

**Utilize Low Leakage
Packing Technology so you
can seal today for a greener
tomorrow.**

Why wait for EPA mandates?

**José Veiga
Technical Director
Teadit**

Standards
Certification
Education & Training
Publishing
Conferences & Exhibits

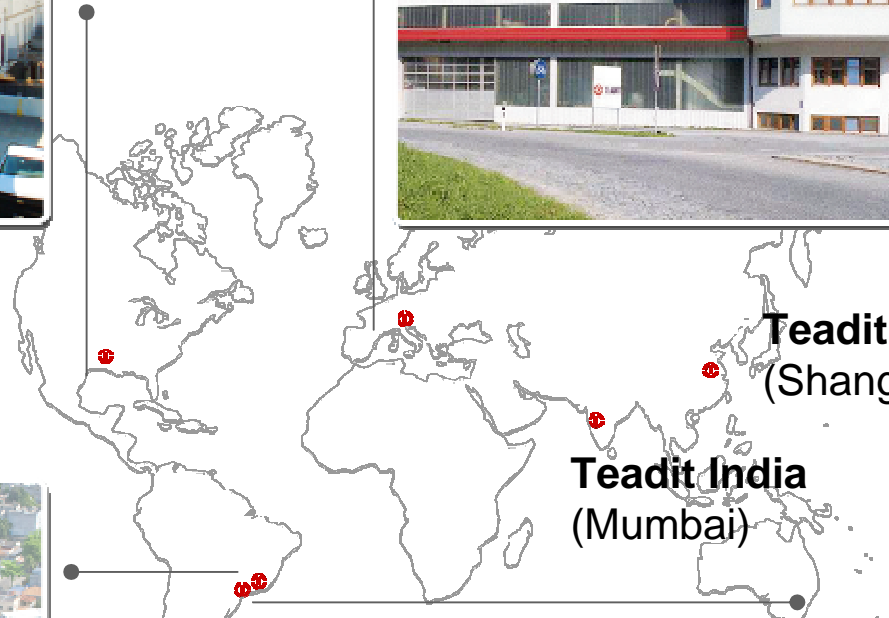
TEADIT PLANTS



Teadit North America
(Houston / USA)



Teadit International
(Kufstein / Austria)



Teadit China
(Shanghai)

Teadit India
(Mumbai)

Teadit Argentina
(Buenos Aires)



Teadit Ind. e Com.
(Rio de Janeiro / Brazil)



Teadit Juntas
(Campinas / Brazil)

SEALING PRODUCTS

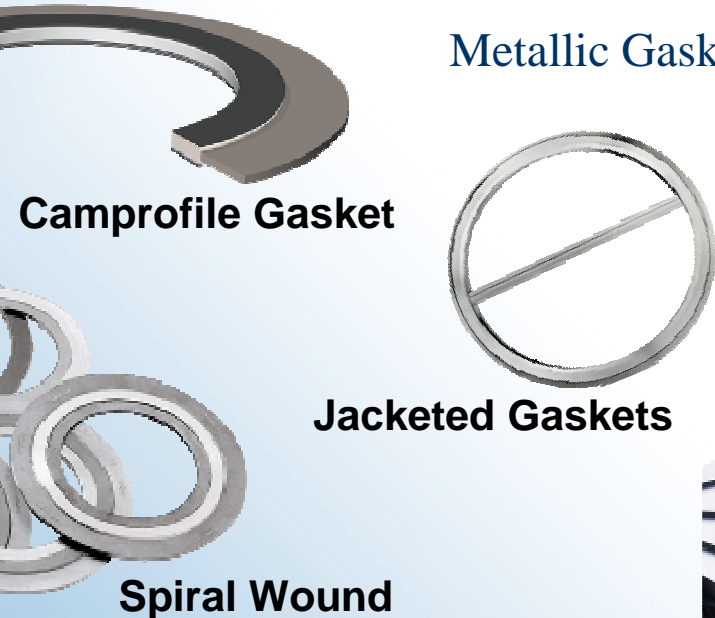
Mechanical Packings



Non-Metallic Gaskets



Metallic Gaskets

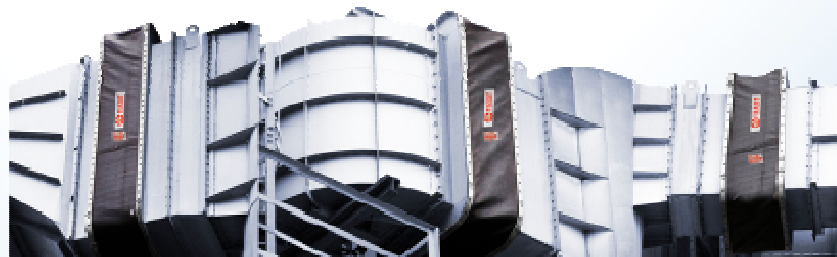


Compressed Gasket Sheet



Expansion Joints

Flue Duct Expansion Joints



Metallic Bellows Expansion Joints

Teadit R & D Laboratories



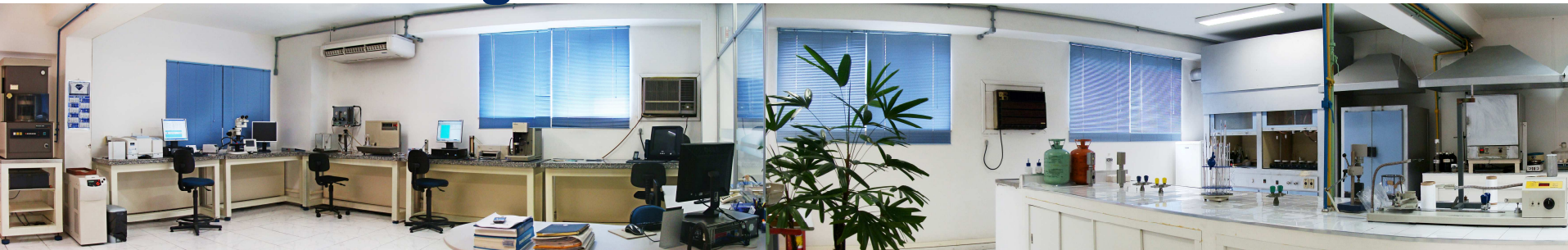
Packing Test Benches



Gasket Testing



Materials Testing



Background: Lack of Standards

Consult packing manufacturer and/or plant engineering department for guidance on torque (FSA)

Tighten the gland bolts to the point where heavy resistance to wrenching is felt

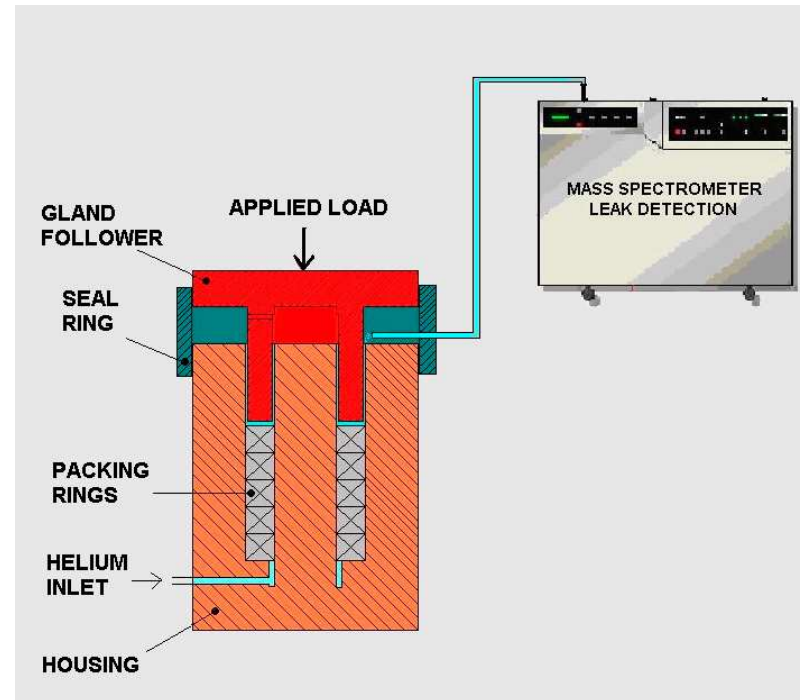
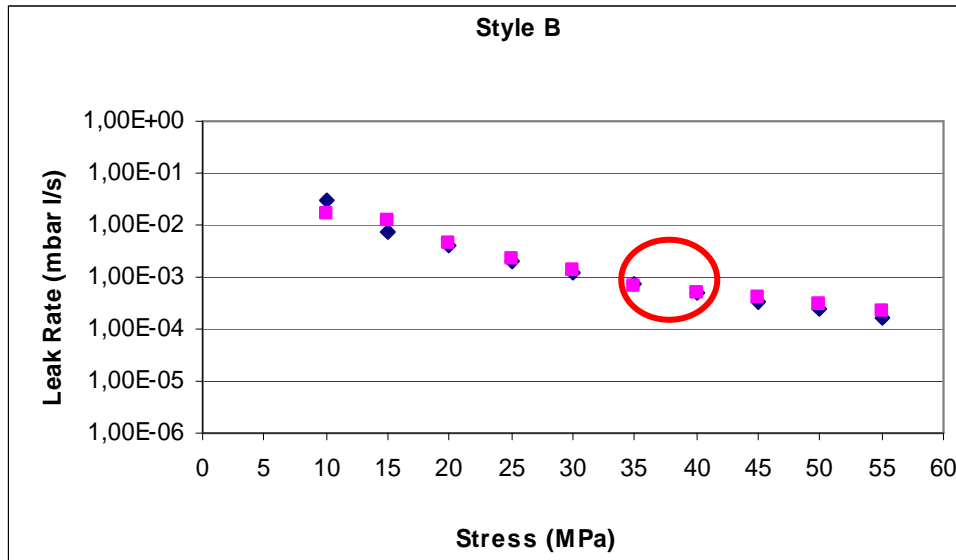
X% of Compression

Packing Seating Stress

ASME – PVP Paper 2008-61214

Teadit and Braskem development

- Develop an Installation Procedure:
 - Similar to flange gaskets
 - Minimum Seating Stress
 - Calculated Installation Stress



Minimum Seating Stress



Style A:
55MPa
(8000 psi)



Style B:
35MPa
(5000 psi)



Style C:
20MPa
(2900 psi)



Style D:
25MPa
(3600 psi)



Existing Conditions

- **Steam Lines:**
 - pressure: 140bar (2030psi)
 - temperature: 550°C (1022°F).
 - history of leaks: up to 2000 tons/year
- **Hydrocarbon Lines:**
 - 17 471 valves
 - Leak rates over 500 ppm: 54%

Field Tests at the Braskem Plant

Steam Lines

- 46 valves packed with Style A
- Sizes from 1/2" to 16"
- No leaks after 36 months

- Seating Stress:

$$S_s = S_{\min(0,01)} + P = 69 \text{ MPa}$$

$$S_{\min(0,01)} = 55 \text{ MPa (8000 psi)}$$

$$P = 140 \text{ bar (2000 psi)}$$

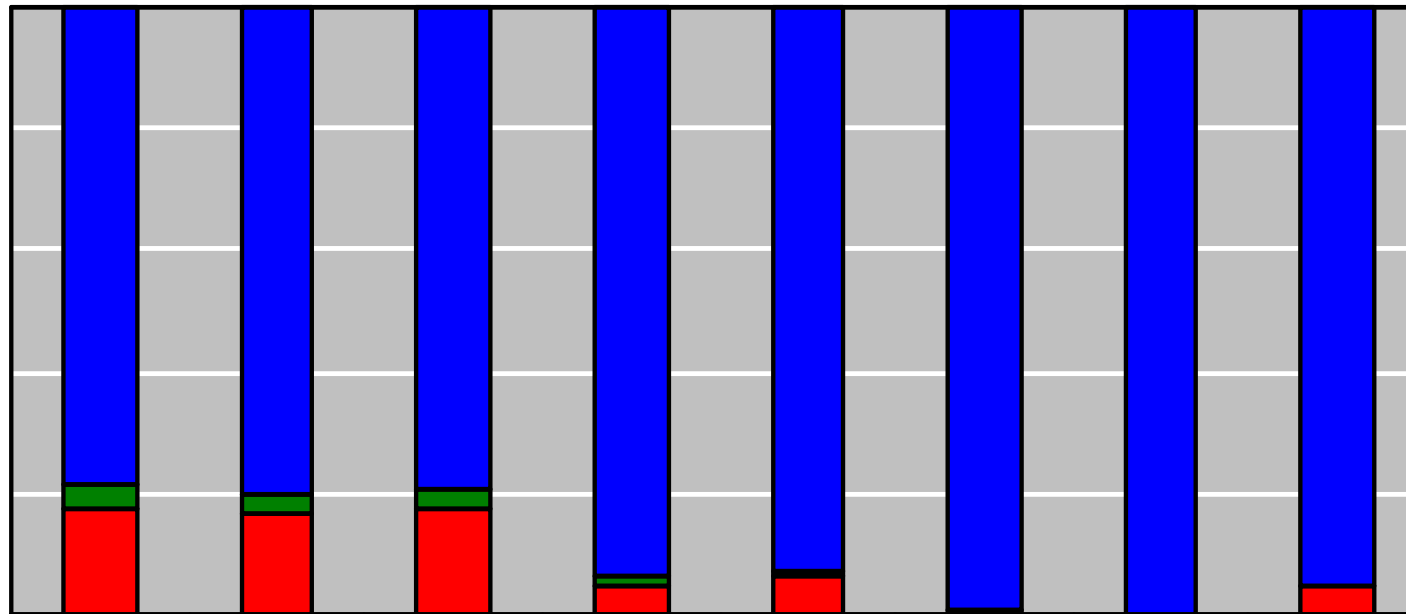


Field Tests at the Braskem Plant

Hydrocarbon Lines

92% < 250 ppm

94% < 500 ppm

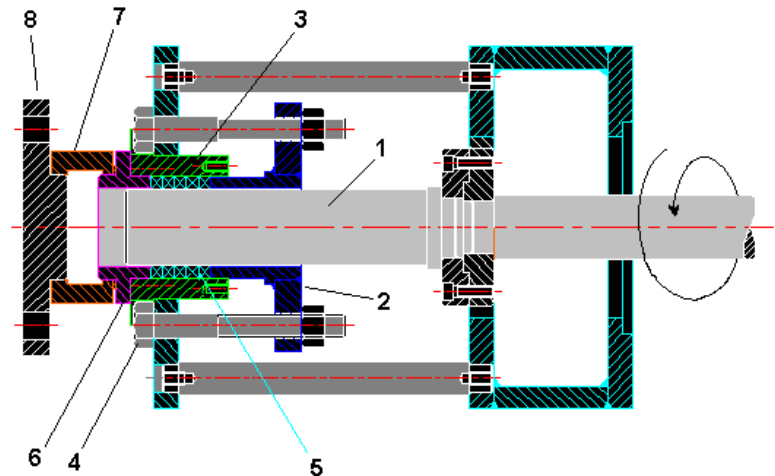


	Angular	Butterfly	Ball	Gate	Globe	Plug	Mach	Others
■ <250 ppmv	242	24	820	11.176	1.574	155	7	63
■ >250 / <500 ppmv	11	1	29	195	23	-	-	-
■ >500 ppmv	54	5	181	527	104	1	-	3

Stem Torque

ASME - PVP2009-77467

THE INFLUENCE OF DIFFERENT BRAIDED PACKING MATERIALS AND NUMBER OF RINGS ON STEM TORQUE AND SEALABILITY

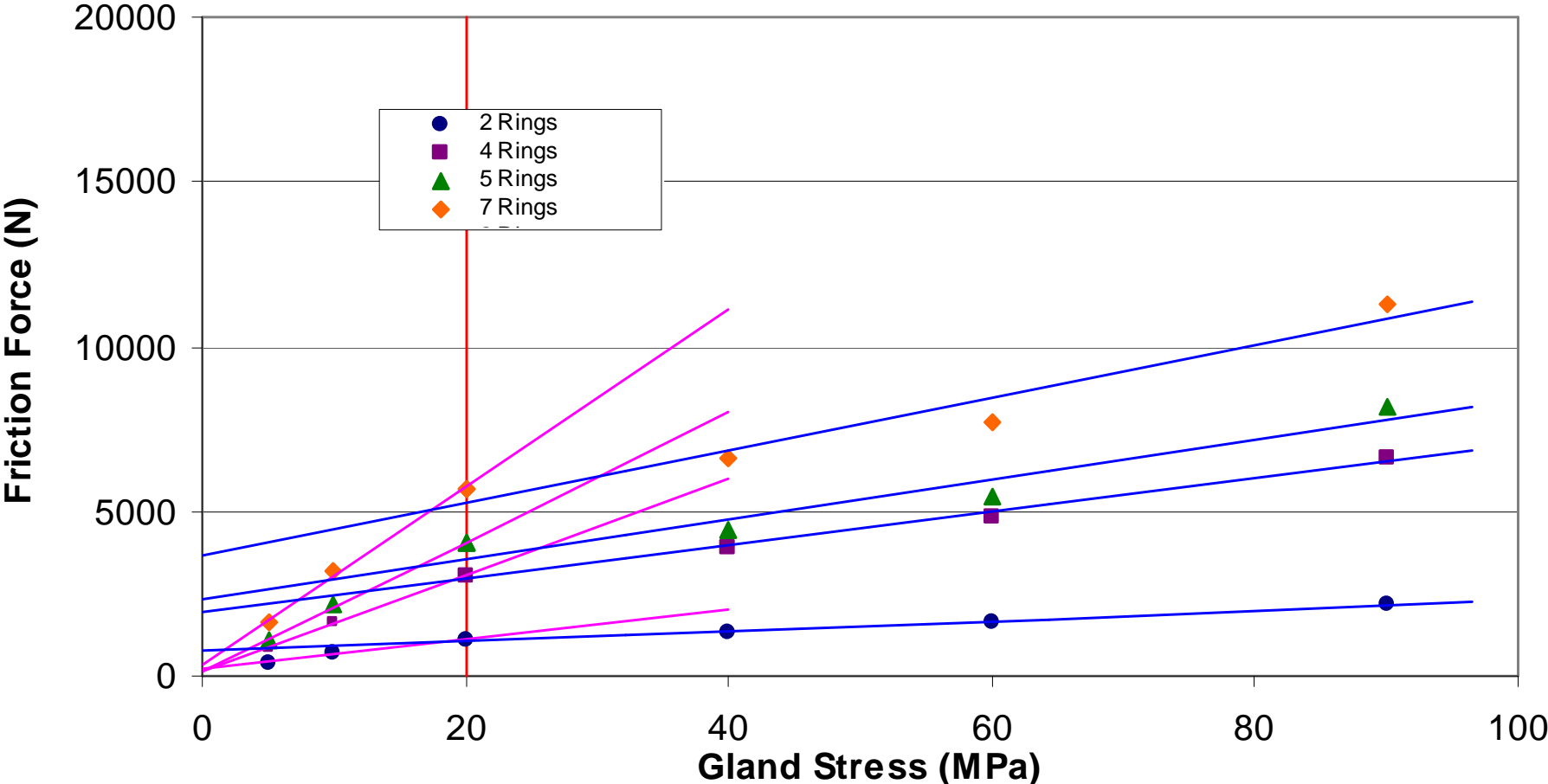


- 1 - Stem
- 2 - Gland
- 3 - Bonnet
- 4 - Internally Gaged Bolt
- 5 - Packing
- 6 - Bushing
- 7 - Load Cell
- 8 - Load Cell Base

Stem Torque

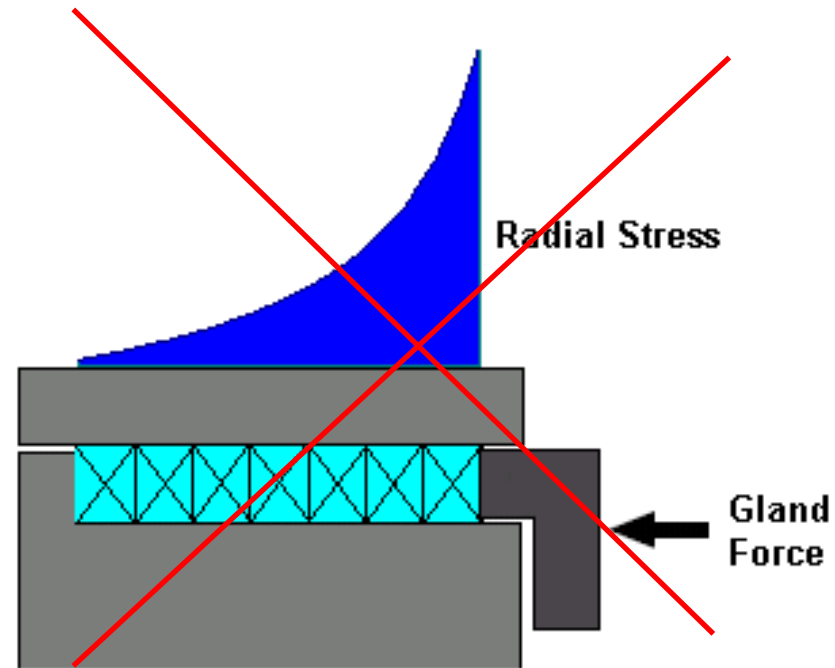
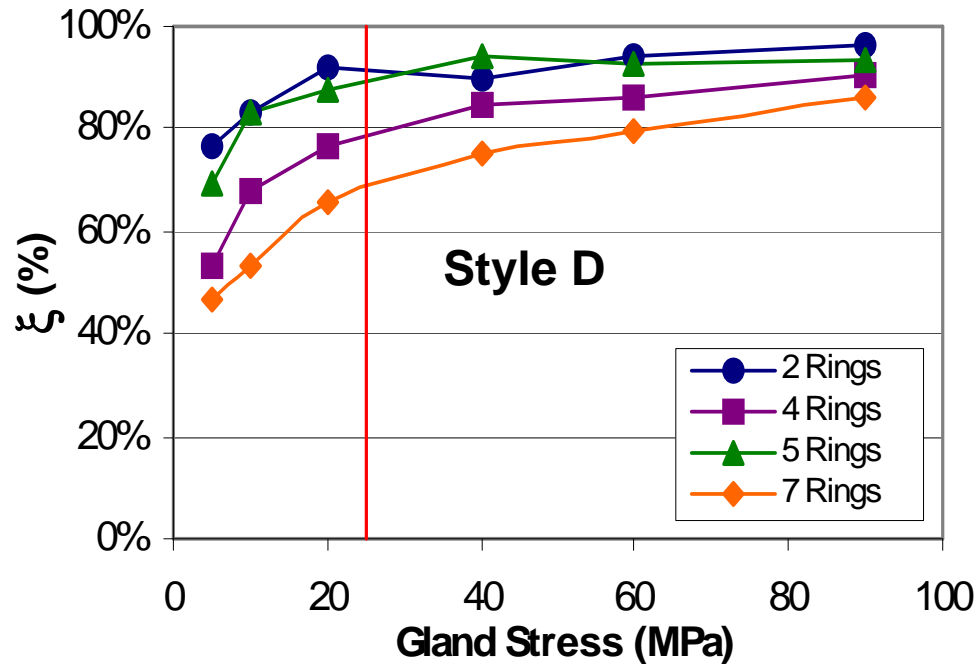


Friction Force Analysis



Stem Torque

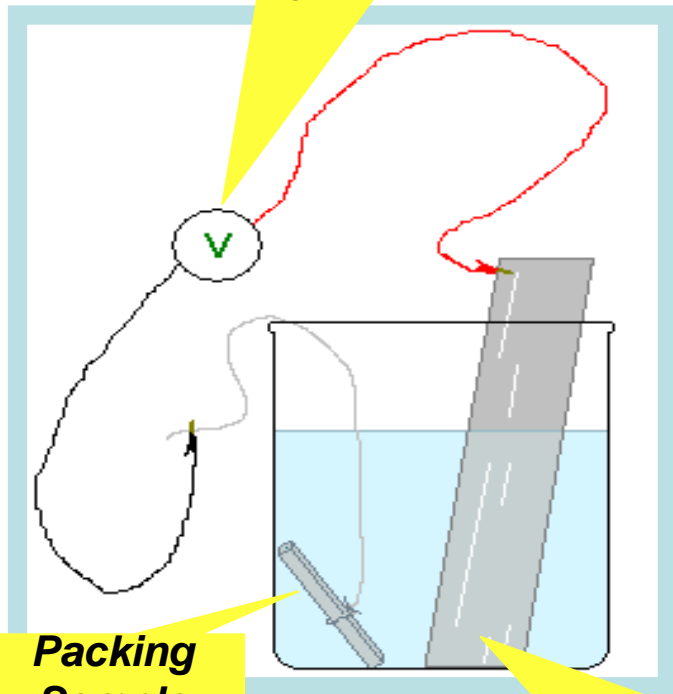
Bottom Ring Residual Axial Stress



Corrosion Inhibitors

Valve World Conference 2010 - TEST METHOD TO ANALISE THE EFICIENCY OF GALVANIC CORROSION INHIBITORS USED ON PACKINGS

Potential Difference Indicator/Register



Packing Sample

Steel Bar simulating Valve Stem



Corrosion Inhibitors

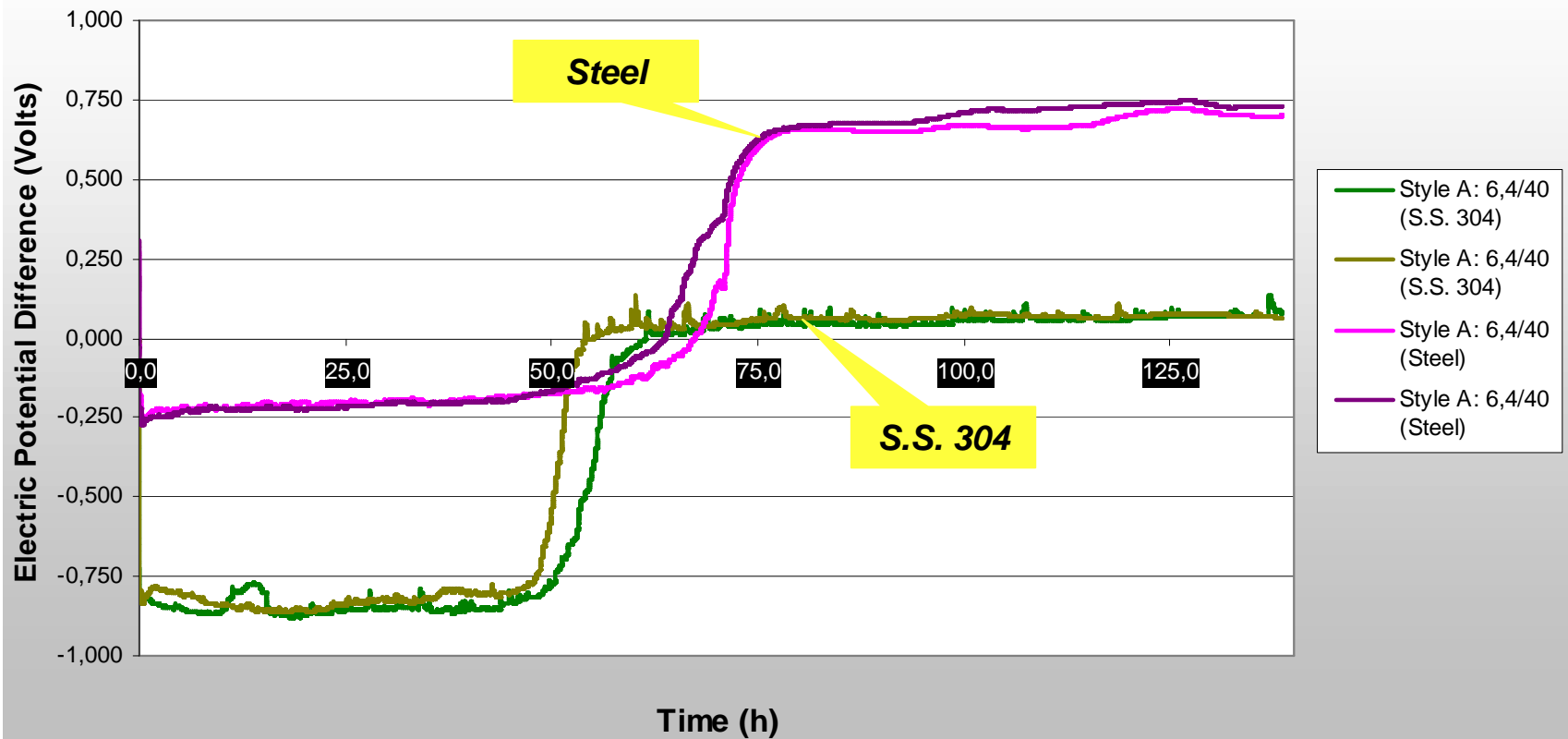


Packing: Style A

Sample Length: 40mm

Cross-Section: 1/4"

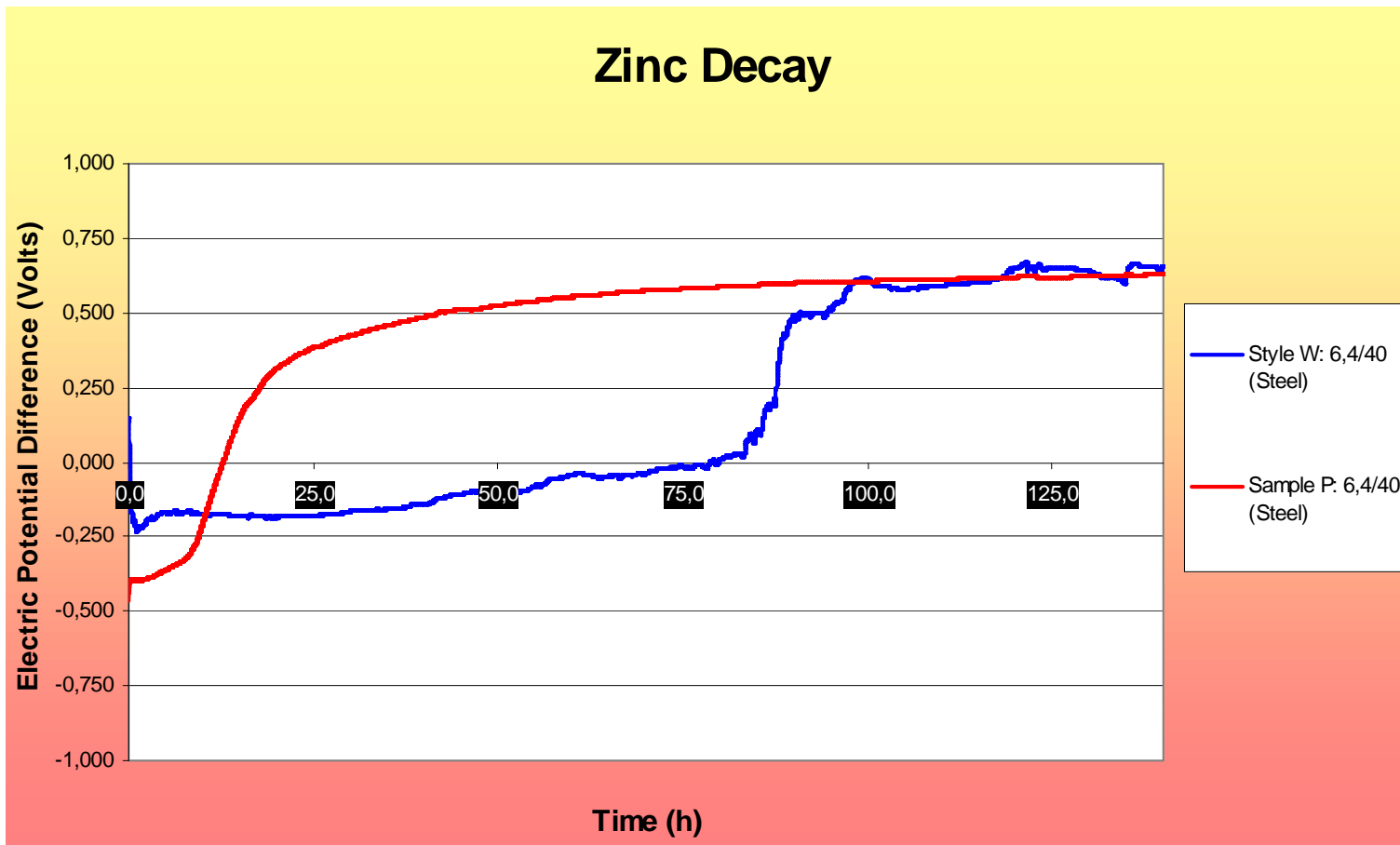
Zinc Decay



- The stem material has great influence on the corrosion.

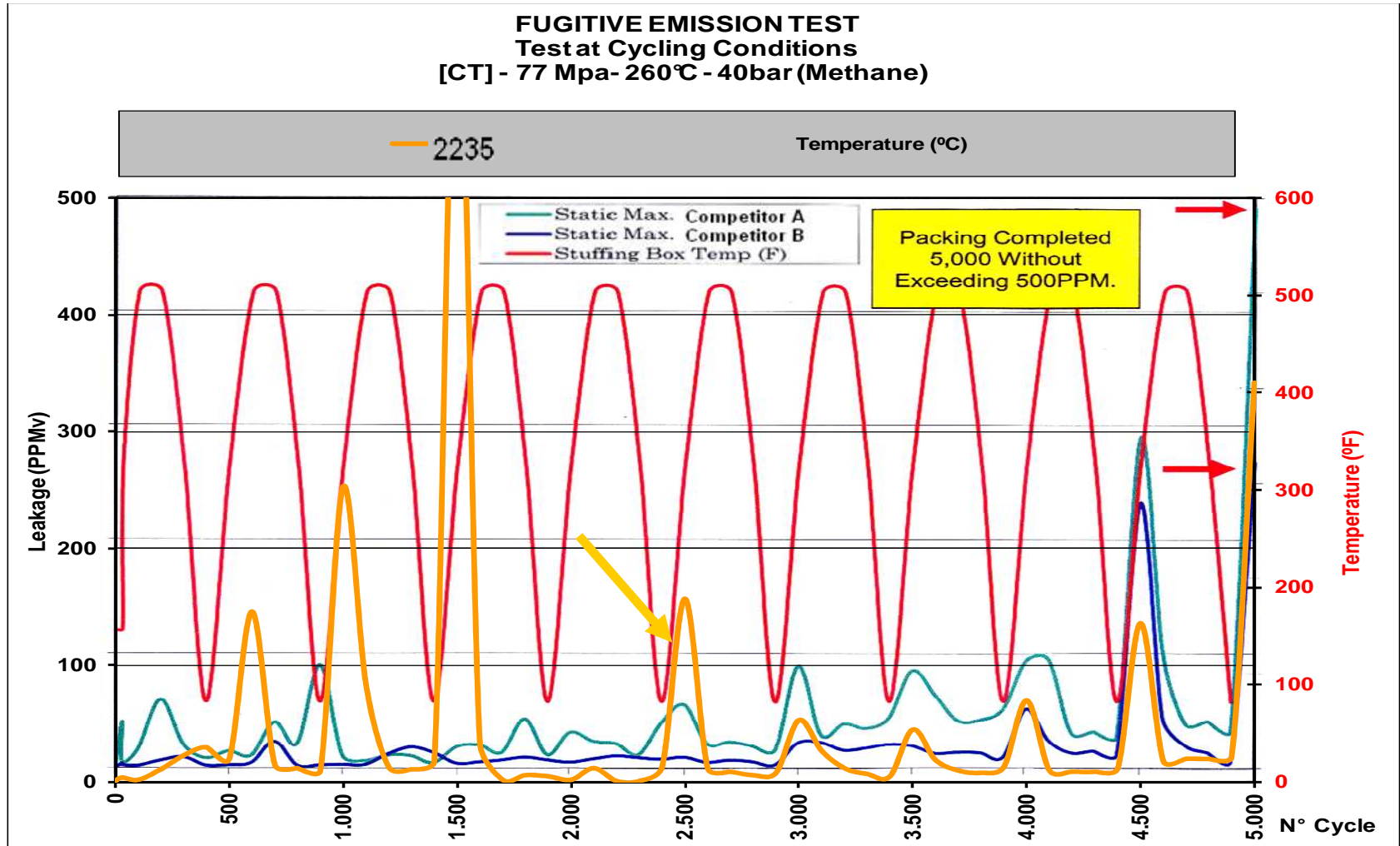
Corrosion Inhibitors

- **Packing Sample P:** with **Zinc Powder**.
- **Packing Sample W:** with **Zinc Wires** in the core.



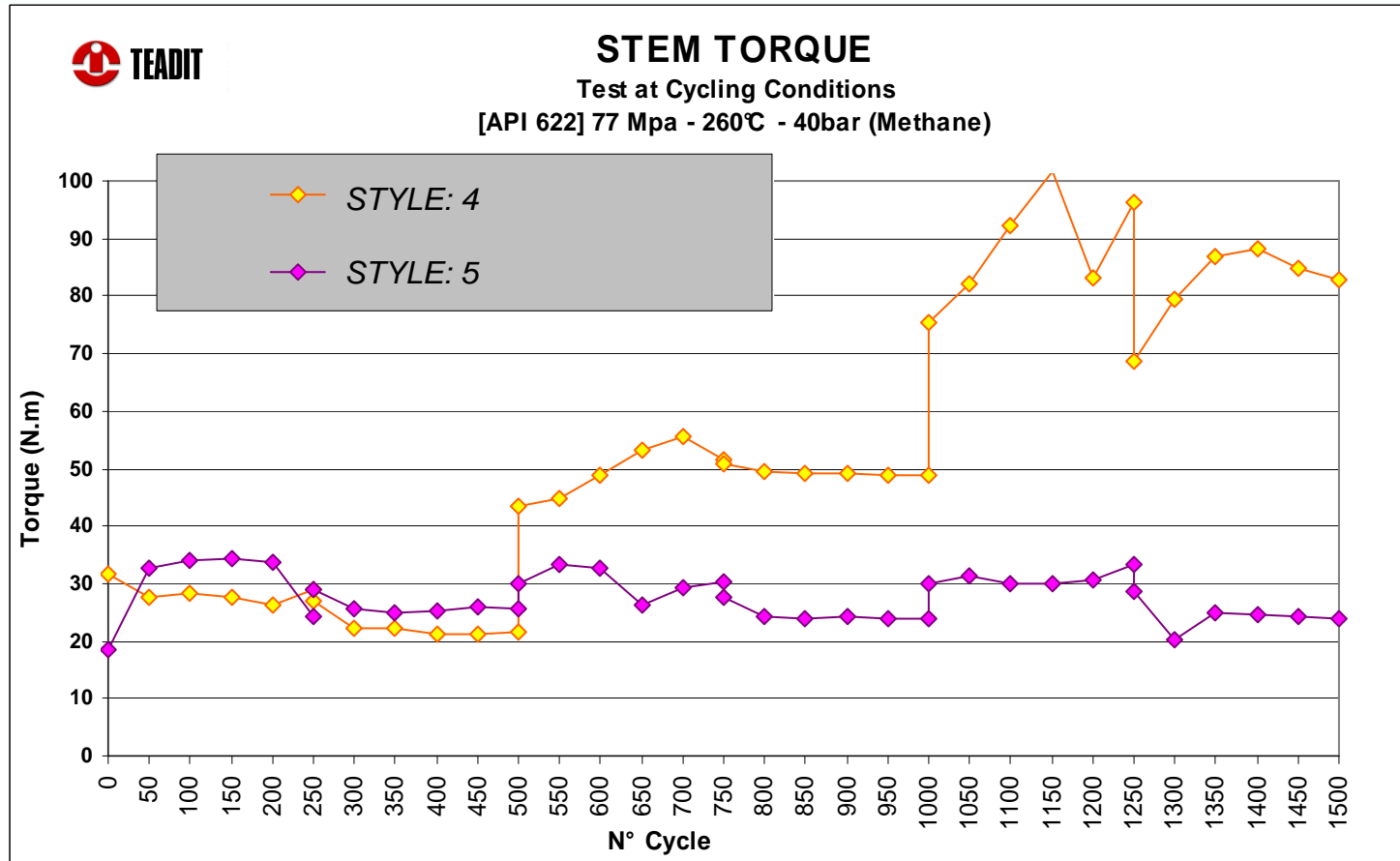
Challenge by D. Reeves

In God We Trust! Everyone Else, Bring The Data!



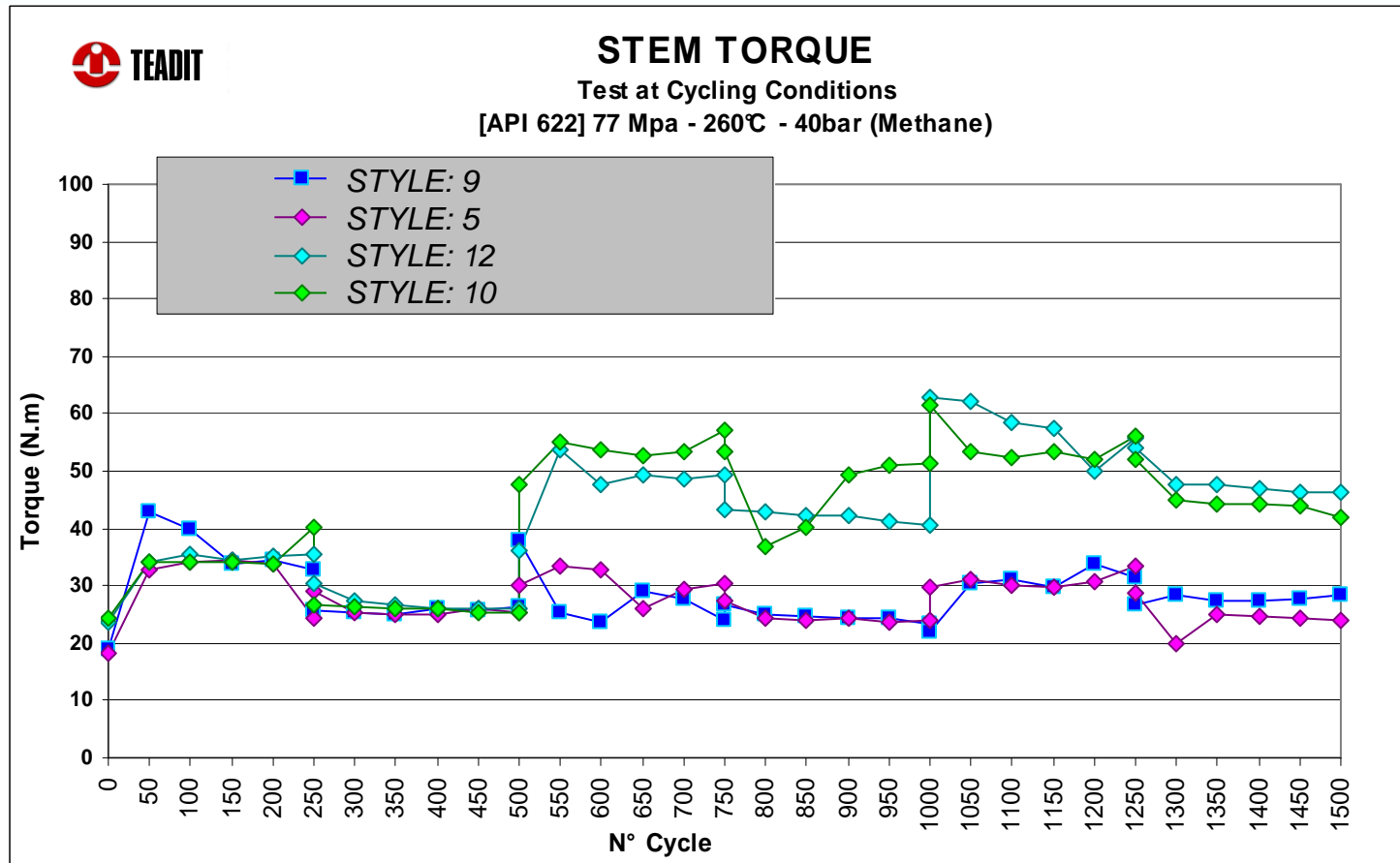
Develop an *EXTREME LOW EMISSION* packing

Impregnation Method



- **STYLE 4 = High Torque**
- **STYLE 5 = Torque OK!**

Quantity of Impregnant



- **STYLE 10 and 12 = High Torque**

- **STYLE 5 and 9 = Torque OK!**

Teadit Laboratory Tests

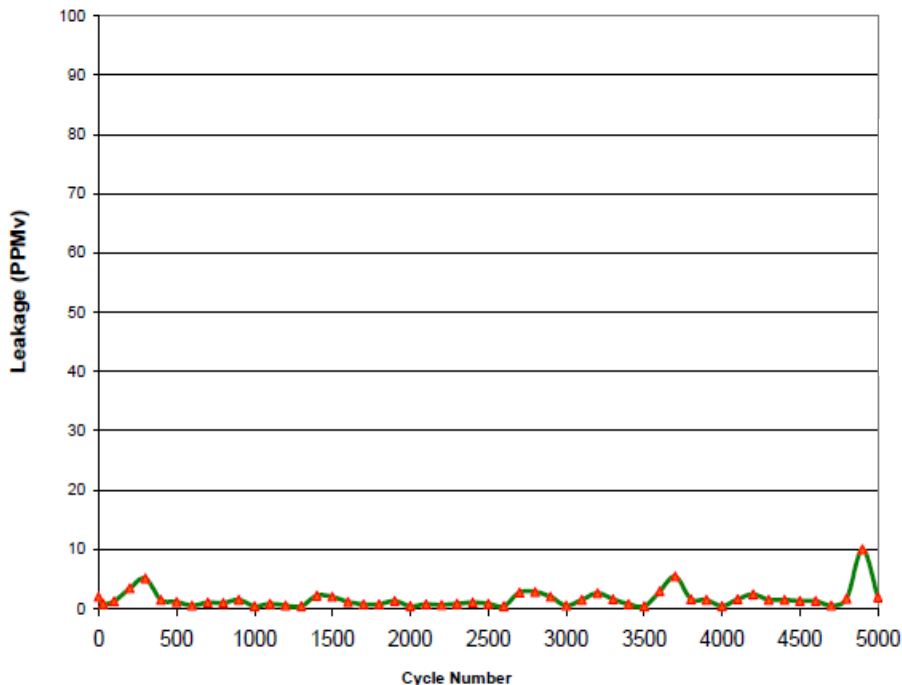


Teadit Research and Development

Chevron Texaco Fugitive Emission Packing Test Report

Style 2236

Static Leakage Chart
Reading



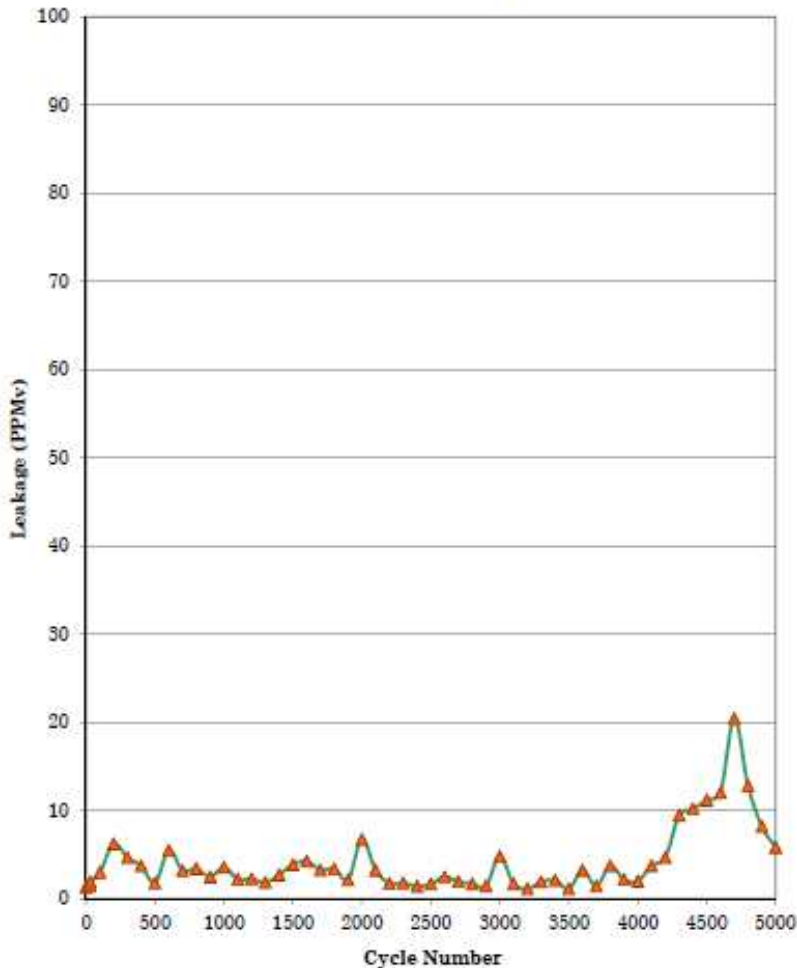
<i>Stem Seal Leakage Readings (PPMv)</i>	
<i>Static</i>	
<i>Reading</i>	
Average:	1,6
Maximum:	10

Third Party Tests



Yarmouth Research and Technology, LLC

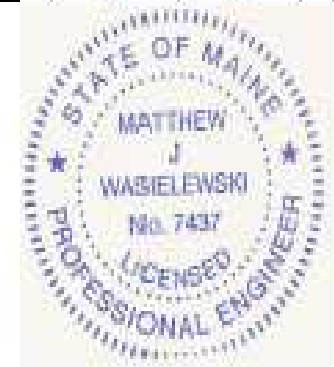
Static Leakage Chart
Maximum Reading



Style 2236

	Stem Seal Leakage Readings (PPMv)				Opening	Closing
	Static		Dynamic		Torque	Torque
	Avg.	Max.	Avg.	Max.	(ft-lb)	(ft-lb)
Average:	4	4	4	6	18	23
Maximum:	19	20	18	25	20	25

Witness *Matthew J. Wabielewski*



Style 2236



Specifications:

Minimum Temperature : - 240 C (-400 F)
Maximum Temperature : 455 C (850 F)
Maximum Pressure : 450 bar (6500 psi)
pH : 0 - 14

Certifications:

- TA-Luft Approval = $1,5 \times 10^{-3}$ mbar.l/s.m ($2,7 \times 10^{-4}$ mg/s.m)
(T = 300° C [572 °F], 40 bar [580 PSI] and 5000 cycles)
- Chevron Test Leak Results: <20 PPMv after 10 Thermal Cycles and 5000 Mechanical Cycles
- Fire Tested to API 607 Specifications

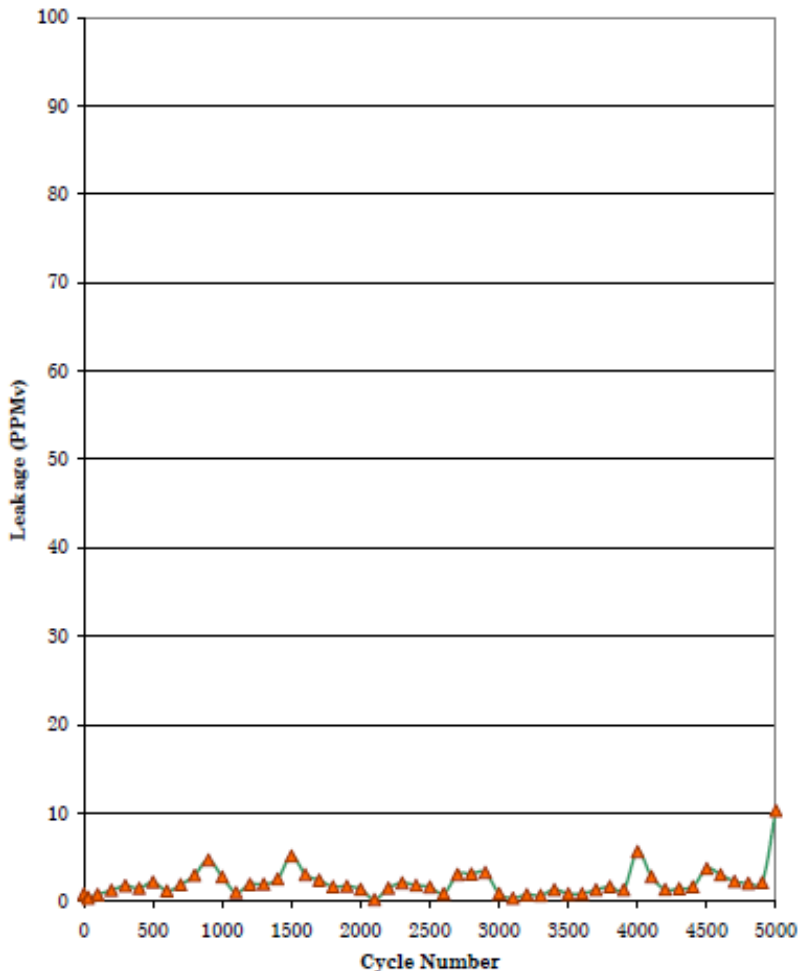


Can we do Better?



Yarmouth Research and Technology, LLC

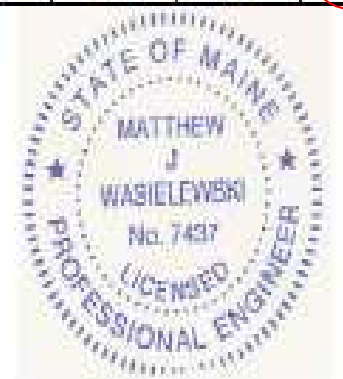
Static Leakage Chart
Maximum Reading



COMBO SET 010-ELE

	Stem Seal Leakage Readings (PPMv)				Opening	Closing
	Static		Dynamic		Torque	Torque
	Aug.	Max.	Aug.	Max.	(ft-lb)	(ft-lb)
Average:	2	2	2	3	15	20
Maximum:	9	10	19	28	18	25

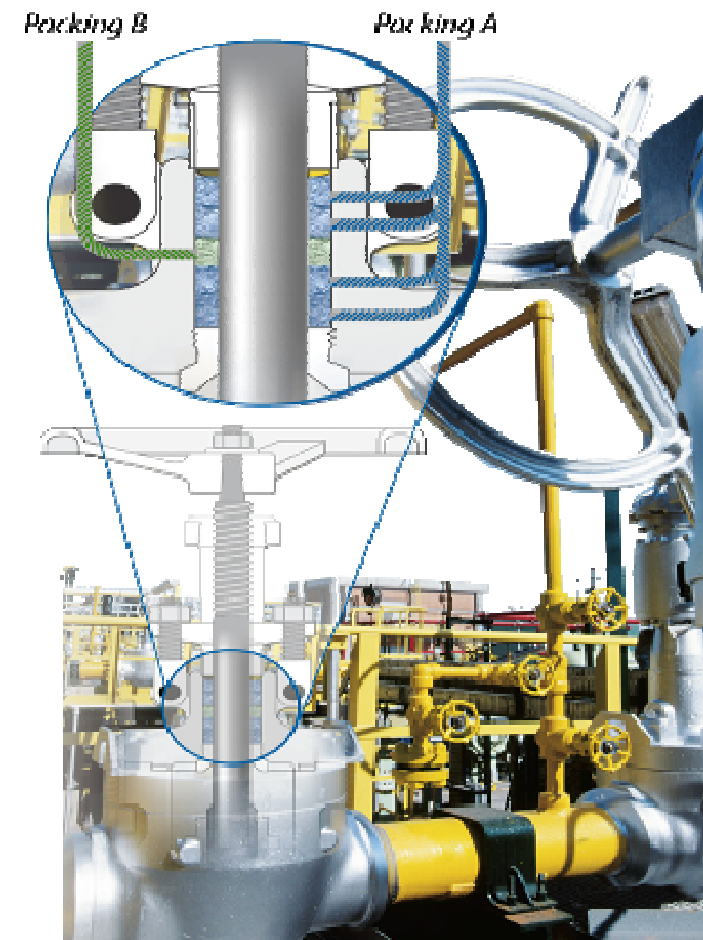
Witness *Matthew J. Wasielewski*



Combo Set 010-ELE



- **Teadit® 010-ELE Combo Set**
 - 4 rings of “Packing A” (2236)
 - 1 ring of “Packing B” (2222)
 - arrangement “A-A-B-A-A”
- **Specifications**
 - Minimum Temperature: - 240 C (- 400 F)
 - Maximum Temperature: 455 C (850 F)
 - Maximum Pressure: 310 bar (4500 psi)
 - pH : 0 – 14 (except strong oxidizers)



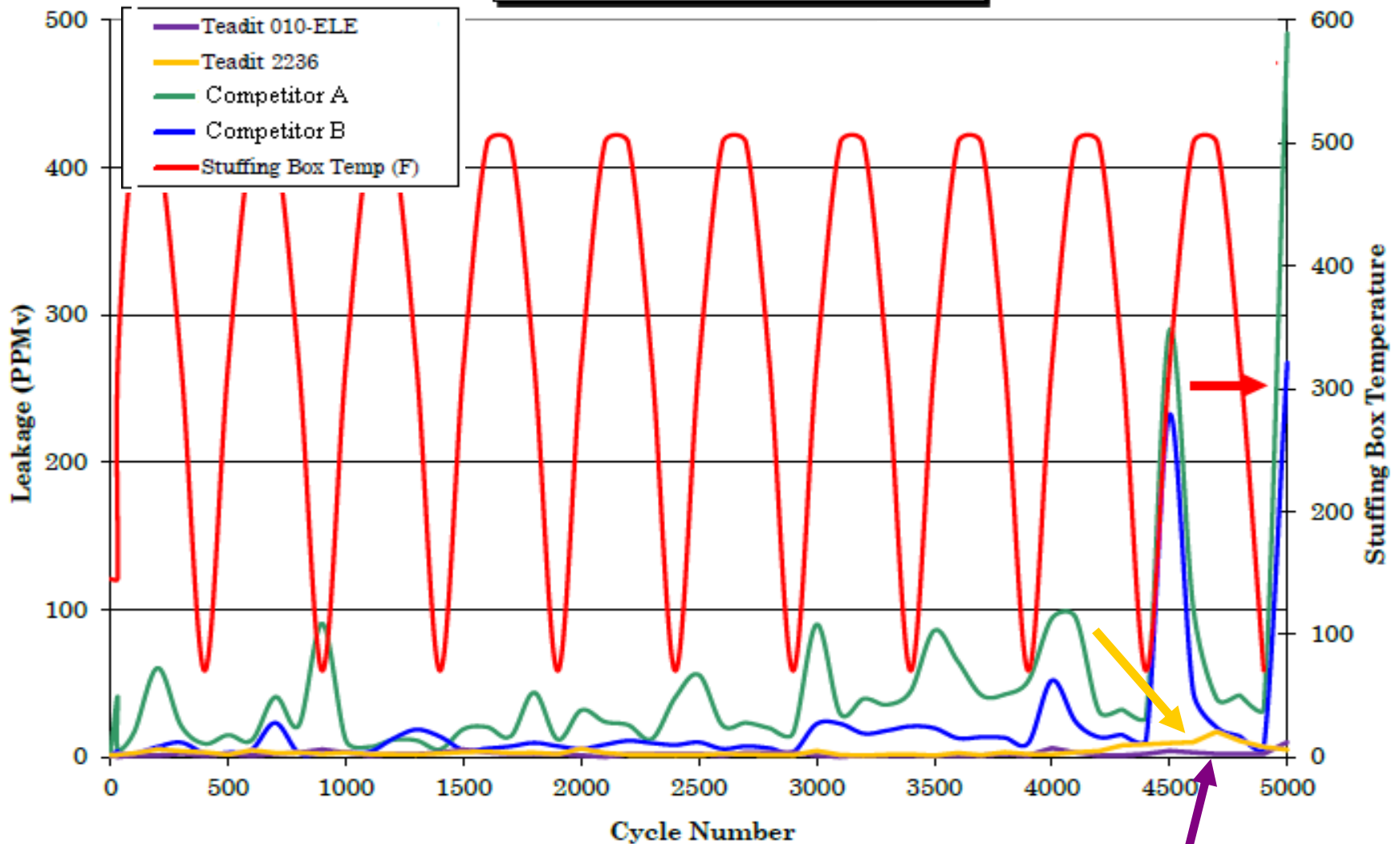
Teadit Data



In God We Trust! Mr. Reeves Here is The Data!

Yarmouth Research and Technology

Static Leakage Maximum Readings Velan 4" Valve



Teadit iPhone & iPad App



Download Free from App Store

SOLUTION  **TEADIT**

INSTALLATION TORQUE FOR



2236

Clear

Media Pressure 600 *psi*

Stem Diameter 1 *in*

Packing Cross-section 1/4 *in*


Number of Gland Bolts 2

Gland Bolt Sizes 5/8 *in*

Installation Torque **57** *lb.ft*

www.teadit.com

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Em Destaque Categorias Top 25 **Buscar** Atualizações



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Thank You!

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