

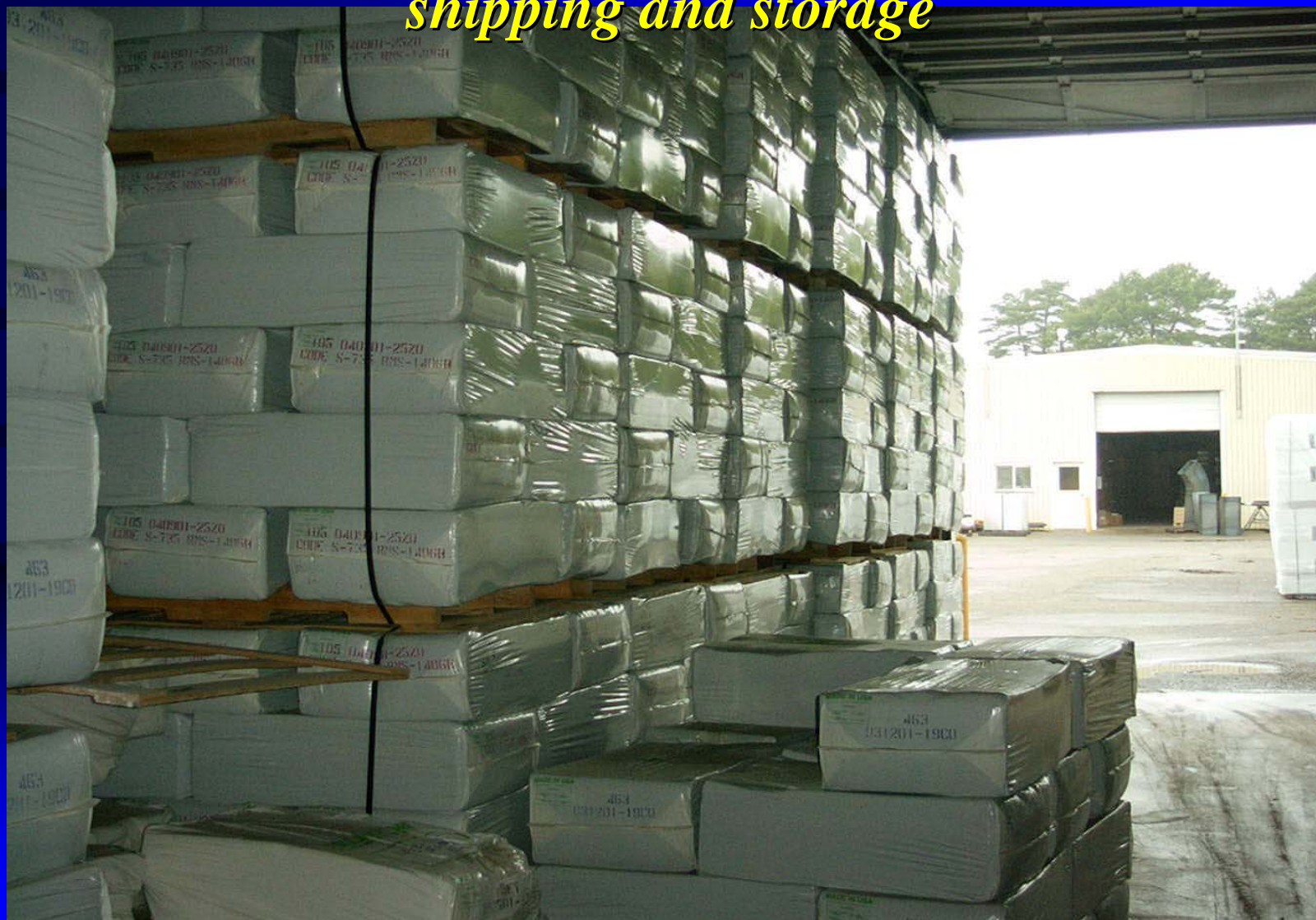


**interfibe™**

# ***Interfibe Fibers***

Properly formulated Interfibe  
cellulose fibers are the most cost  
effective processing aid available to  
the friction industry

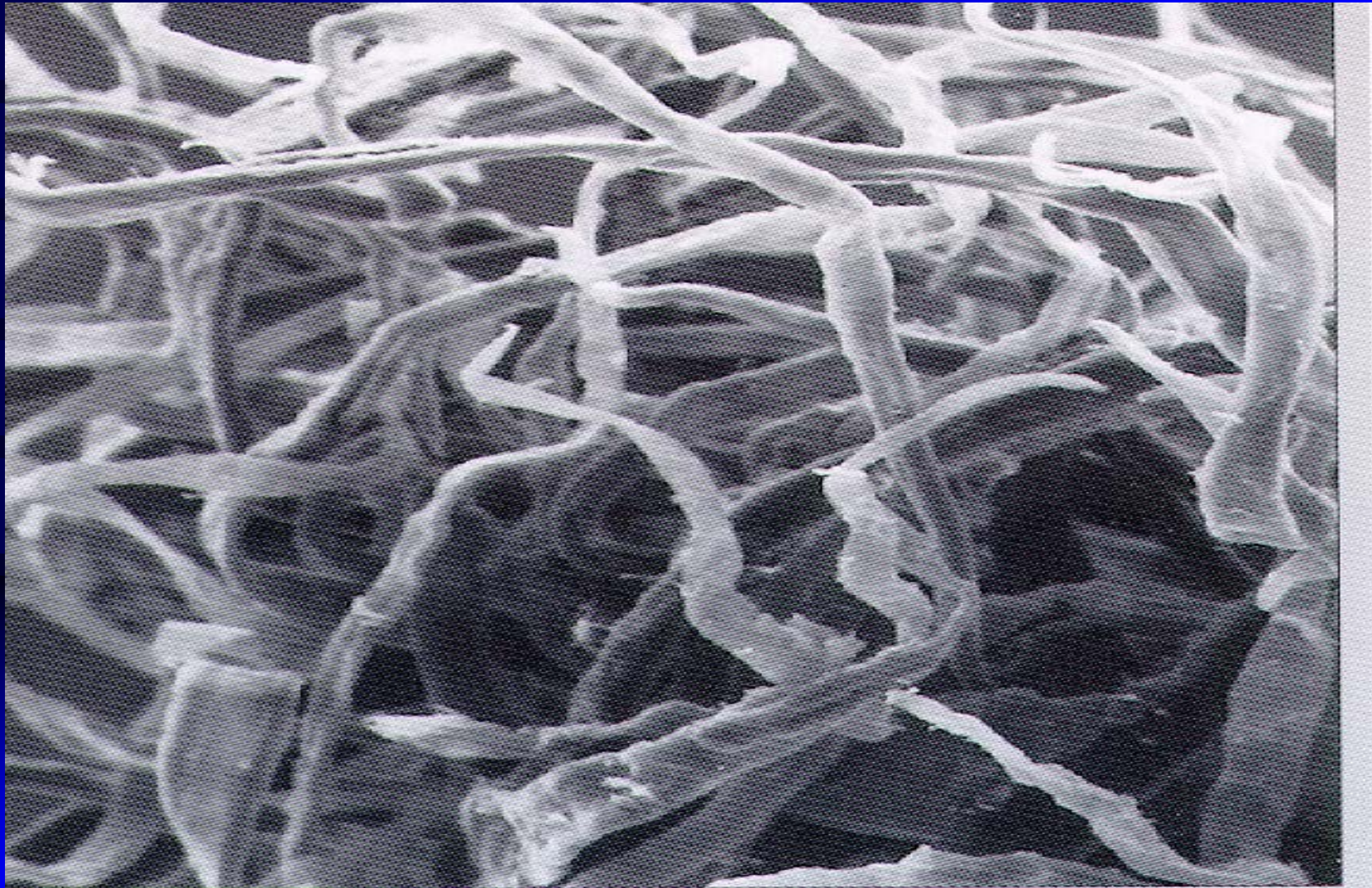
*Pressure packed in polyethylene bags for easy shipping and storage*



# *Quality*

- Our proprietary *JET PROCESS* technology allows us to provide you with a tightly controlled material, with consistent fiber length, moisture level, and process properties.

## *Interfibe Engineered Cellulose Fiber ETF*



# *Current Project*

- **Provide a drop-in replacement for aramid pulp in semi-metallic formulations.**

# *SEMI-METALLIC Formula*

• Steel Wool	23%	• Steel Wool	25%
• Iron Powder	25%	• Iron Powder	25%
• Phenolic Resin	12%	• Phenolic Resin	12%
• Iron Oxide	8%	• Iron Oxide	8%
• Limestone/Barytes	8%	• Limestone/Barytes	8%
• Graphite	12%	• Graphite	12%
• Coke	6%	• Coke	6%
• Rubber Part.	2%	• Rubber Part.	2%
• <b>INTERFIBE ETF</b>	<b>4%</b>	• <b>Aramid Pulp</b>	<b>2%</b>

## Semi-Metallic Cost Savings

	Aramid Pulp	Acrylic Pulp	Interfibe ETF
\$\$ Per LB	\$0.56	\$0.43	\$0.36
\$\$ per pad (D52)	\$0.29	\$0.23	\$0.19



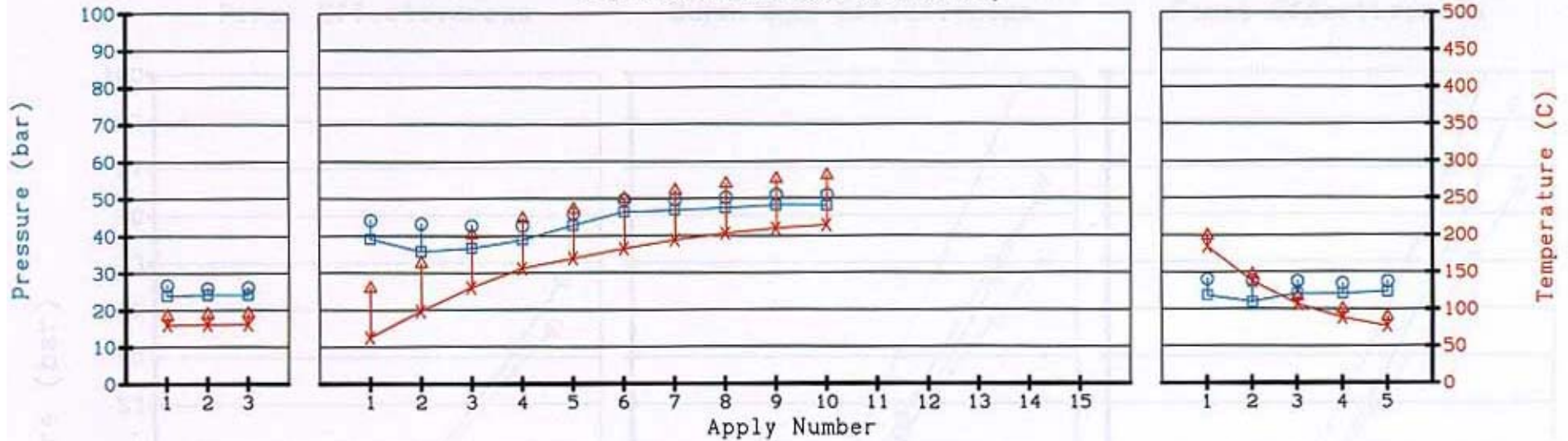
# *Semi-Metallic Test Results*

	<u>Aramid Pulp</u>	<u>Interfibe</u>
• Specific Gr.	3.05	3.096
• Gogan Hard	14	13
• Link Compressibility		
– Room Temp	79/134	60/73
– 200'c	78/97	86/92
– 400'c	288/308	313/333

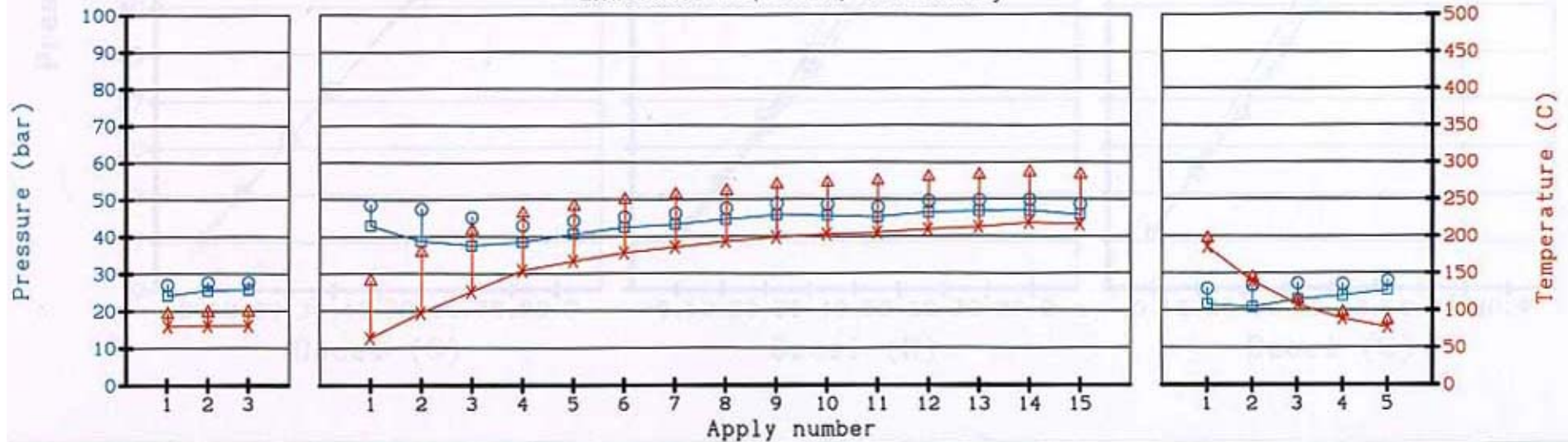
# *Semi-Metallic Test Results*

	<u>Aramid Pulp</u>	<u>Interfibe</u>
• Link Swell		
– 200'c	19/22	20/28
• SAE Swell		
– 400'c	308/324	278/329

1st Baseline, Fade, & Recovery



2nd Baseline, Fade, & Recovery

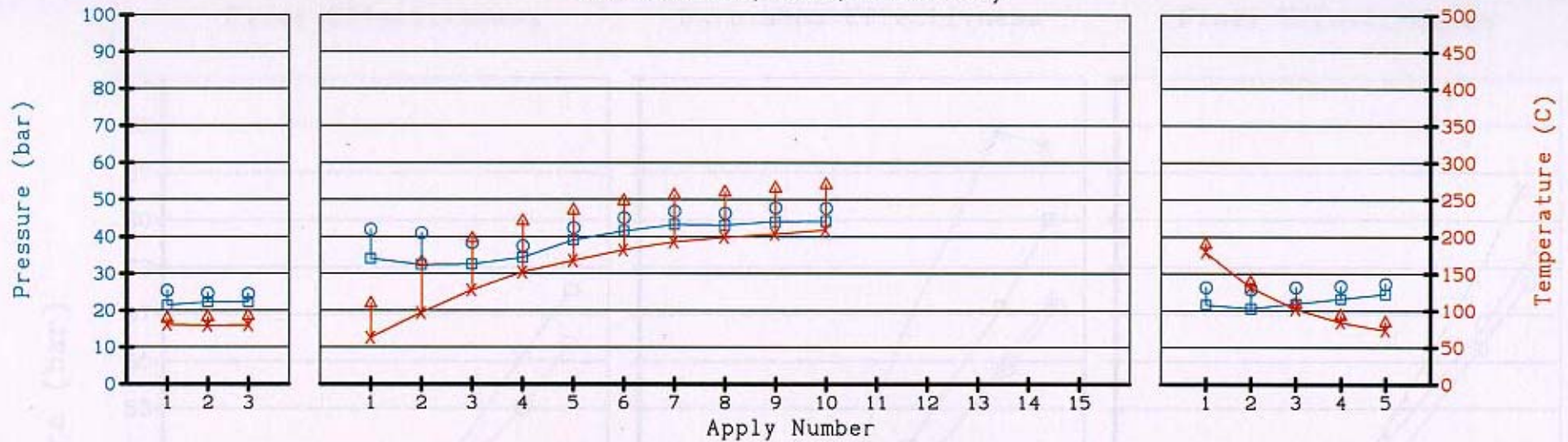


TEST #:	98A211-C	INERTIA REQ. (kg.m <sup>2</sup> ):	72.5	
PROCEDURE:	FMVSS/105-75	INERTIA ACT. (kg.m <sup>2</sup> ):	68.6	
BRAKE TYPE:	D52	ROLLING RADIUS (cm):	30.48	
WHEEL LOAD REQ. (kg):	782.9	INNER:	x629	
WHEEL LOAD ACT. (kg):	738.6	OUTER:	x629	

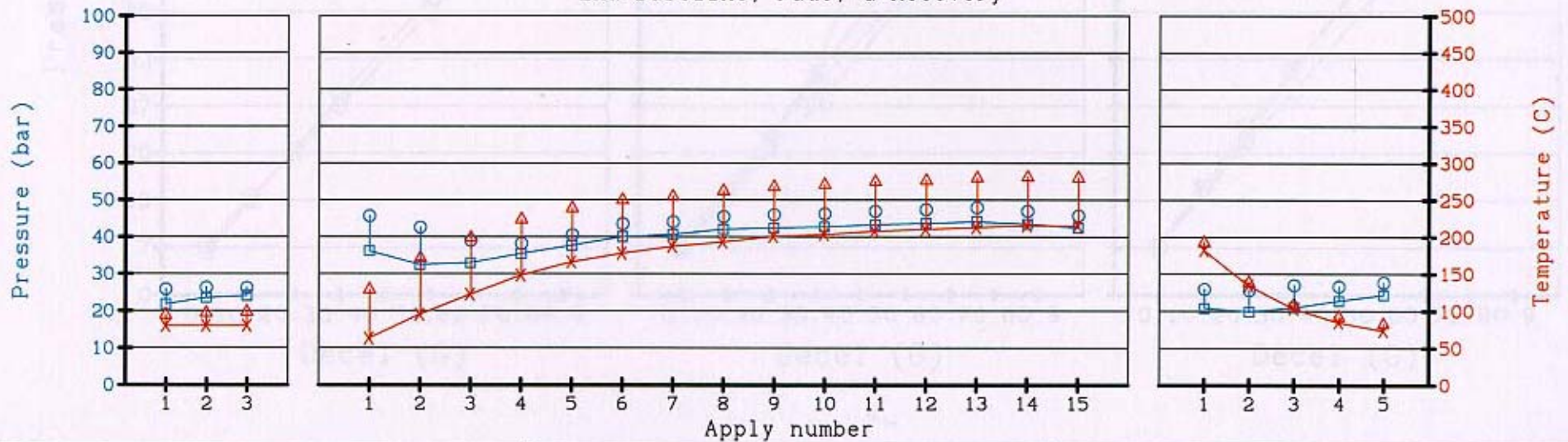
  

Pressure	
□ Average	○ Maximum
Temperature	
X Initial	△ Final

1st Baseline, Fade, & Recovery



2nd Baseline, Fade, & Recovery

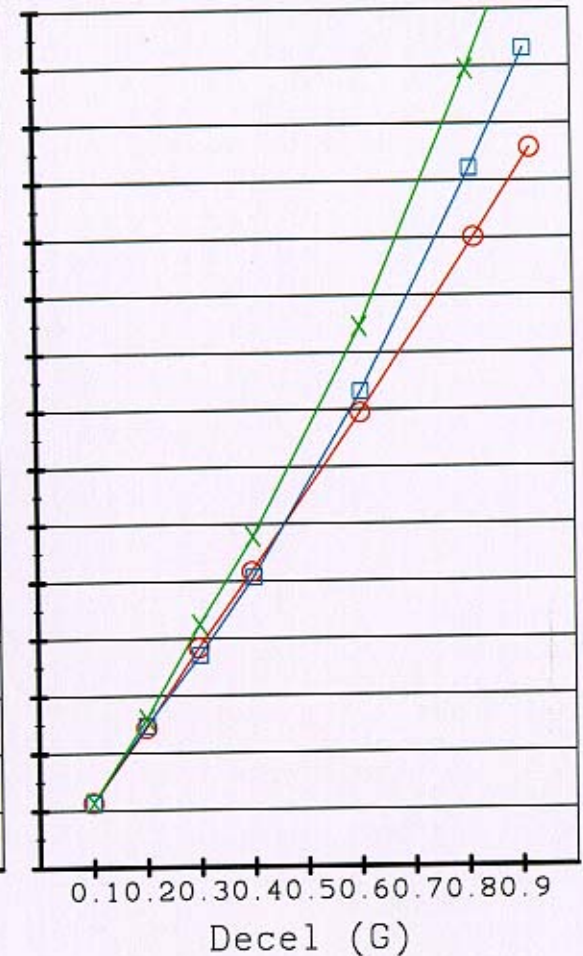
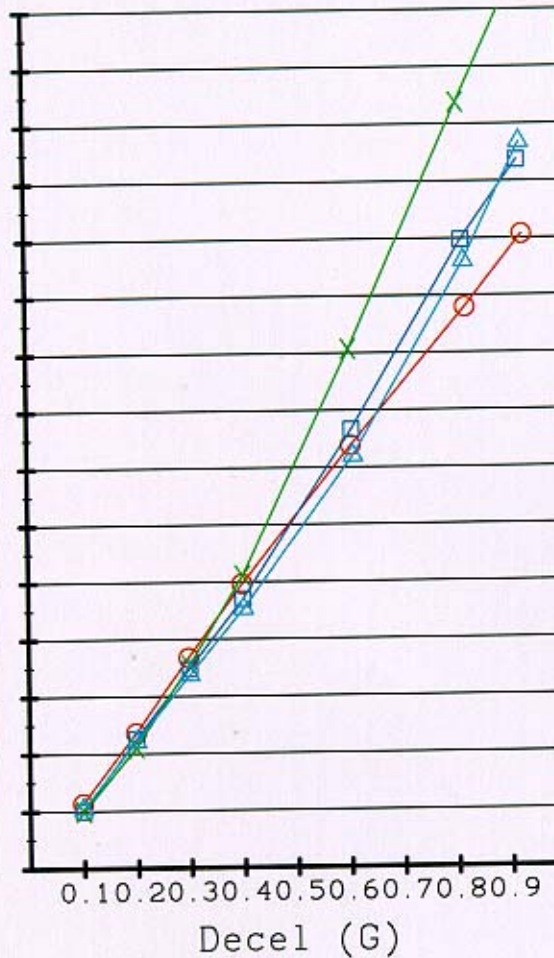
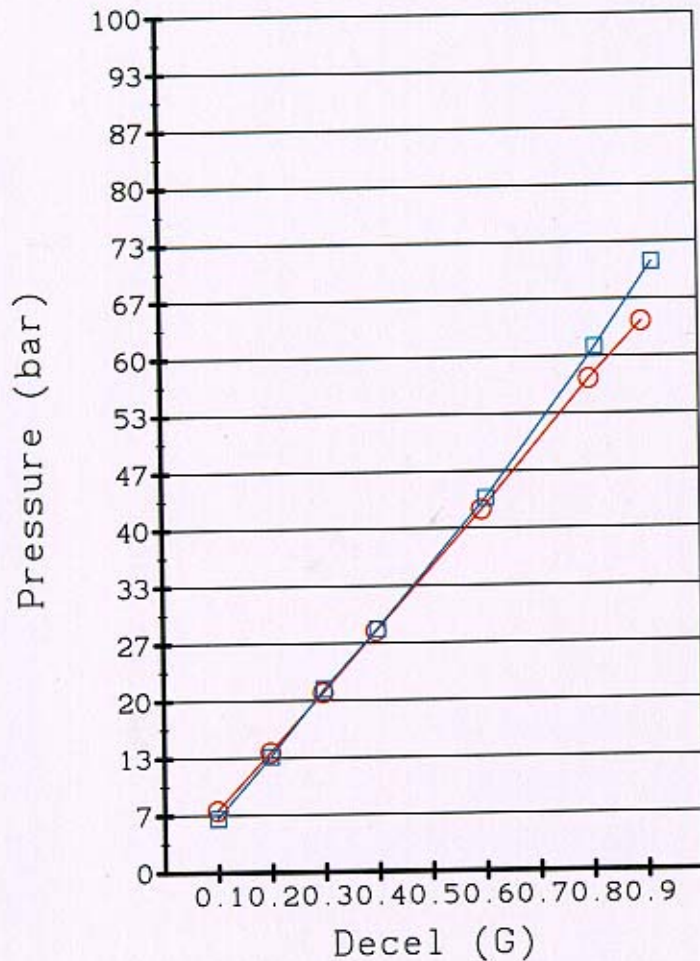


TEST #:	98A211-D	INERTIA REQ. (kg.m <sup>2</sup> ):	72.5	Pressure □ Average    ○ Maximum Temperature X Initial    △ Final
PROCEDURE:	FMVSS/105-75	INERTIA ACT. (kg.m <sup>2</sup> ):	68.6	
BRAKE TYPE:	D52	ROLLING RADIUS (cm):	30.48	
WHEEL LOAD REQ. (kg):	782.9	INNER:	x630	
WHEEL LOAD ACT. (kg):	738.6	OUTER:	x630	

First Effectiveness

Burnished Effectiveness

Final Effectiveness

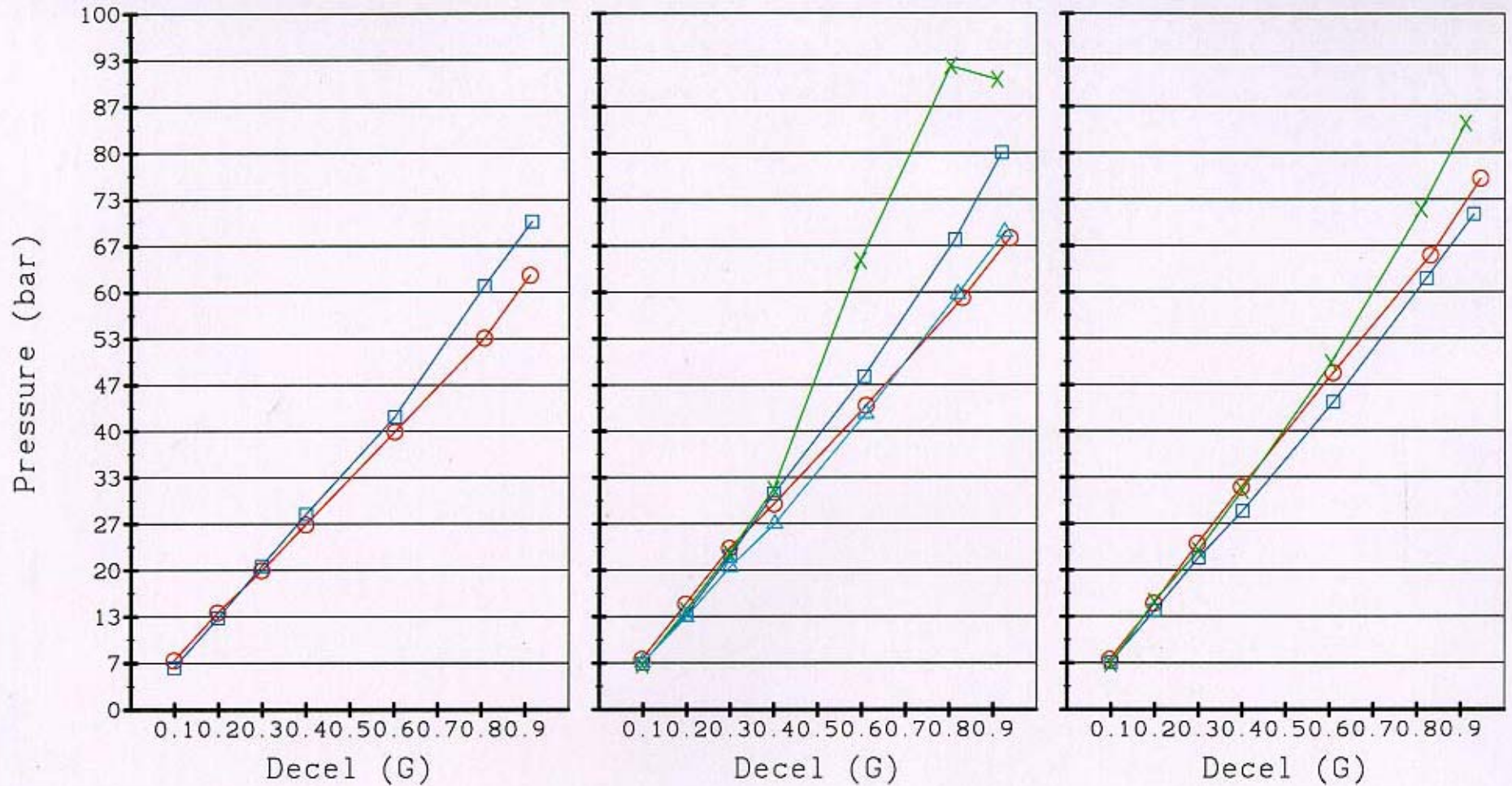


TEST #:	98A211-C	INERTIA REQ. (kg.m <sup>2</sup> ):	72.5	48 kph	
PROCEDURE:	FMVSS/105-75	INERTIA ACT. (kg.m <sup>2</sup> ):	68.6	96 kph	
BRAKE TYPE:	D52	ROLLING RADIUS (cm):	30.48	128 kph	
WHEEL LOAD REQ. (kg):	782.9	INNER:	x629	2nd 96 kph	
WHEEL LOAD ACT. (kg):	738.6	OUTER:	x629		

First Effectiveness

Burnished Effectiveness

Final Effectiveness



TEST #:	98A211-D	INERTIA REQ. (kg.m <sup>2</sup> ):	72.5	48 kph	○
PROCEDURE:	FMVSS/105-75	INERTIA ACT. (kg.m <sup>2</sup> ):	68.6	96 kph	□
BRAKE TYPE:	D52	ROLLING RADIUS (cm):	30.48	128 kph	×
WHEEL LOAD REQ. (kg):	782.9	INNER:	x630	2nd 96 kph	△
WHEEL LOAD ACT. (kg):	738.6	OUTER:	x630		

# *Quality*

- *INTERFIBE Corp.* is a self-certified vendor with many of our QS-9000 customers, providing material that is 100% ON-TIME / ON-SPEC.

## *Interfibe's current involvement with the Friction Industry*

- **Interfibe has been involved with the friction industry since 1987.**
- **Interfibe is approved for use as a process fiber in over 24 manufacturing plants**
- **Interfibe has established relationships with independent formulators in the industry**
- **Interfibe has established relationships with independent testing facilities in the industry**
- **Interfibe has provided formulations and testing services for customers**



# *Current Project*

- Evaluation of Interfibe ETF in NAO friction material

## NAO

<b>FORMULA: DENSITY</b>	<b>COST/LB</b>	<b>WT/SET</b>	<b>COST/SET</b>
2.17	\$0.27	24.03	\$6.49

RAW MATERIAL	COST	Specific Gravity	Batch. Weight	Weight %	Volume	Volume %	Formula Costs
INTERFIBE ETF	\$0.260	1.46	5.2	4.87	3.34	7.25	0.008
BARIUM SULFATE	\$0.069	4.33	20	18.74	4.33	9.40	0.013
MARBLE WHITE MW325	\$0.028	2.71	20	18.74	6.92	15.02	0.005
VERMICULITE	\$0.150	2.25	10	9.37	4.17	9.04	0.014
PMF	\$0.270	2.7	14	13.12	4.86	10.55	0.035
CASHEW PARTICLES	\$0.520	1.15	3	2.81	2.44	5.31	0.015
PHENOLIC \$0.650	\$0.650	1.25	14	13.12	10.50	22.79	0.085
CARBON BLACK	\$0.720	1.8	0	0.00	0.00	0.00	0.000
RECLAIM RUBBER	\$0.210	1.15	4	3.75	3.26	7.08	0.008
PALMER 4000-1	\$2.180	1.18	1	0.94	0.79	1.72	0.020
GRAPHITE 3226	\$0.145	2.26	3	2.81	1.24	2.70	0.004
BRASS CHIPS	\$1.450	8.4	0.5	0.47	0.06	0.12	0.007
WOLLASTONITE F1	\$0.115	2.9	6	5.62	1.94	4.21	0.006
FIBERGLASS 1/8 DE	\$0.860	2.54	6	5.62	2.21	4.81	0.048
<b>TOTALS</b>			<b>106.70</b>	<b>99.98</b>	<b>46.06</b>	<b>100.00</b>	<b>0.268</b>

# ***Interfibe Fibers***

**Properly formulated Interfibe  
cellulose fibers are the most cost  
effective processing aid available to  
the friction industry**

## *Interfibe's long term commitment to the Friction Industry*

- Interfibe is committed to providing our customers with innovative products and technical support
- Interfibe is committed to providing our customers with products that conform to the highest quality standards
- Interfibe is committed to providing a stable and timely source of cellulose fiber

# ***INTERFIBE***

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