
Superior Products International
Corrosion and Insulation Specialists

Introduction

Superior Products International

- Founded in 1989
- Headquartered in Shawnee, Kansas, U.S.A.
- Global Operations
    - Middle East, Asia, Canada, Europe, South America, Central America, and Africa.

GULF SILICONE
سليكون الخليج

Clients

GAZPROM

ecoPETROL

Drydocks World

Eni

Saipem

NUCOR

شركة مبارك البحرية
MUBARAK MARINE LLC

Vancouver Shipyards

LG Chem

Traditional Pipe Insulation

How it works:

- Contains small pockets of air that only slow conductive heat transfer
- Heat will be absorbed and transferred.

Why it’s not effective

- Designed to absorb and transfer heat
- Insulation cannot hold heat inside the pipe
- Air space allows heat to dissipate

Disadvantages

1. **Inefficient. Allows heat to escape**

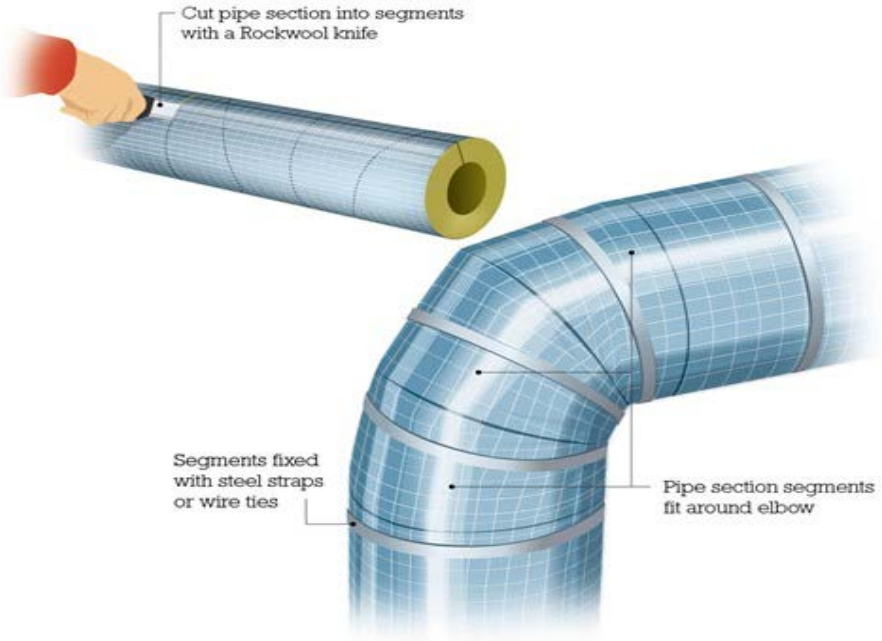
2. **Always loads moisture**
   - Kills ability to insulate
   - Leads to Corrosion Under Insulation [CUI]
   - Deterioration

Rockwool, fiberglass, or other traditional types of insulation promote corrosion, and also act as a carrier and spread the corrosion to other areas of the pipeline

Disadvantages

3. **Removed during repair and inspection**
   - Costly!
   - Moisture entry

4. **Cannot conform to valves and elbows well**



Solution

HPC®

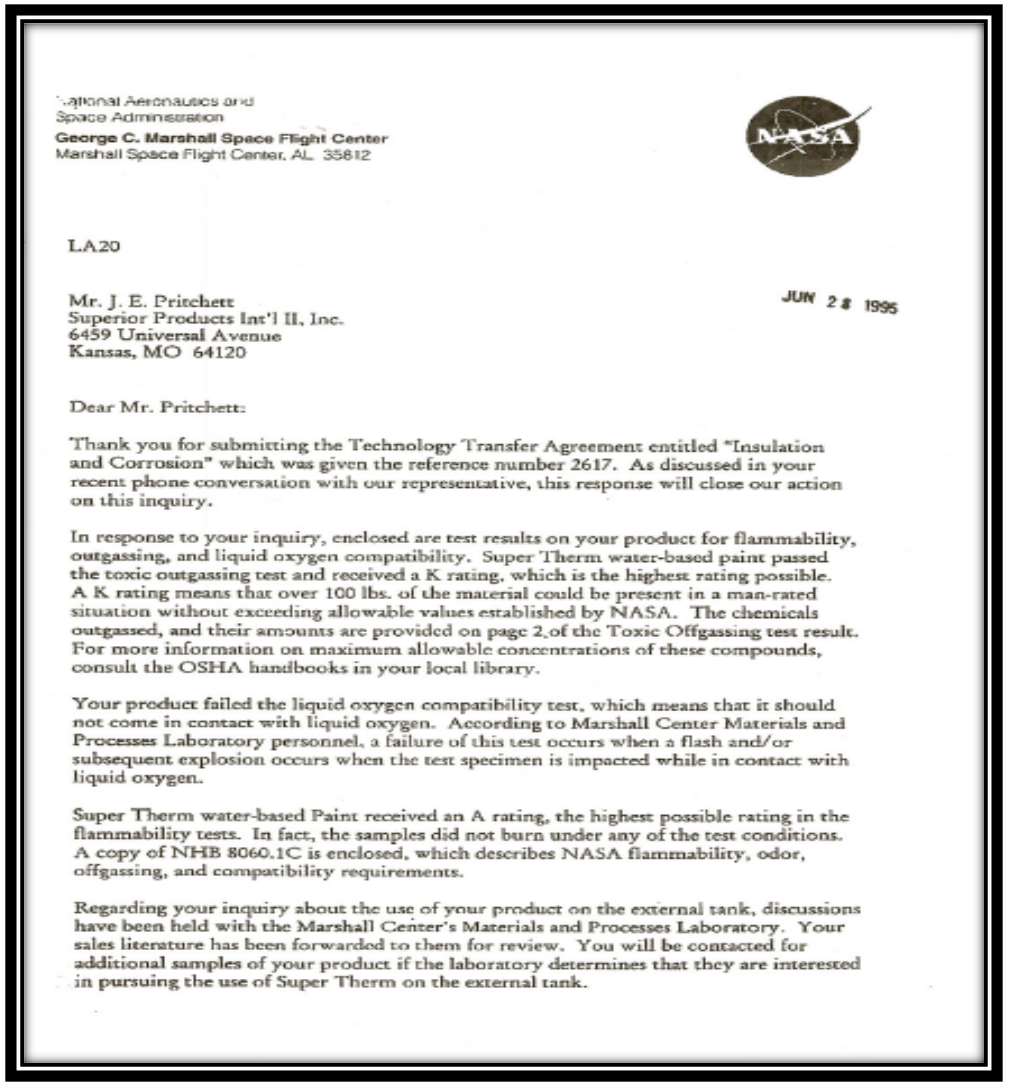
GAZPROM

Introduction

NASA Technology Transfer Agreement

- Reference # 2617 [1995]

- Low density ceramics developed in cooperation with NASA.
- To date, 3,200 ceramic compounds researched



National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

LA20

JUN 28 1995

Mr. J. E. Pritchett
Superior Products Int'l II, Inc.
6459 Universal Avenue
Kansas, MO 64120

Dear Mr. Pritchett:

Thank you for submitting the Technology Transfer Agreement entitled "Insulation and Corrosion" which was given the reference number 2617. As discussed in your recent phone conversation with our representative, this response will close our action on this inquiry.

In response to your inquiry, enclosed are test results on your product for flammability, outgassing, and liquid oxygen compatibility. Super Therm water-based paint passed the toxic outgassing test and received a K rating, which is the highest rating possible. A K rating means that over 100 lbs. of the material could be present in a man-rated situation without exceeding allowable values established by NASA. The chemicals outgassed, and their amounts are provided on page 2 of the Toxic Offgassing test result. For more information on maximum allowable concentrations of these compounds, consult the OSHA handbooks in your local library.

Your product failed the liquid oxygen compatibility test, which means that it should not come in contact with liquid oxygen. According to Marshall Center Materials and Processes Laboratory personnel, a failure of this test occurs when a flash and/or subsequent explosion occurs when the test specimen is impacted while in contact with liquid oxygen.

Super Therm water-based Paint received an A rating, the highest possible rating in the flammability tests. In fact, the samples did not burn under any of the test conditions. A copy of NHB 8060.1C is enclosed, which describes NASA flammability, odor, offgassing, and compatibility requirements.

Regarding your inquiry about the use of your product on the external tank, discussions have been held with the Marshall Center's Materials and Processes Laboratory. Your sales literature has been forwarded to them for review. You will be contacted for additional samples of your product if the laboratory determines that they are interested in pursuing the use of Super Therm on the external tank.

TRAPS HEAT

Original Surface Temp: 500F
HPC® Surface Temp:160F - 315F

Original Surface Temp:500F
Surface Temp After HPC®: 838F

Steel Factory

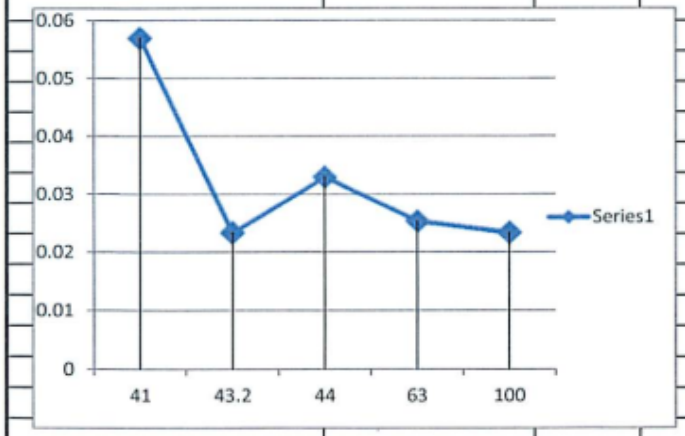
Surface Temp after HPC®= +1000F

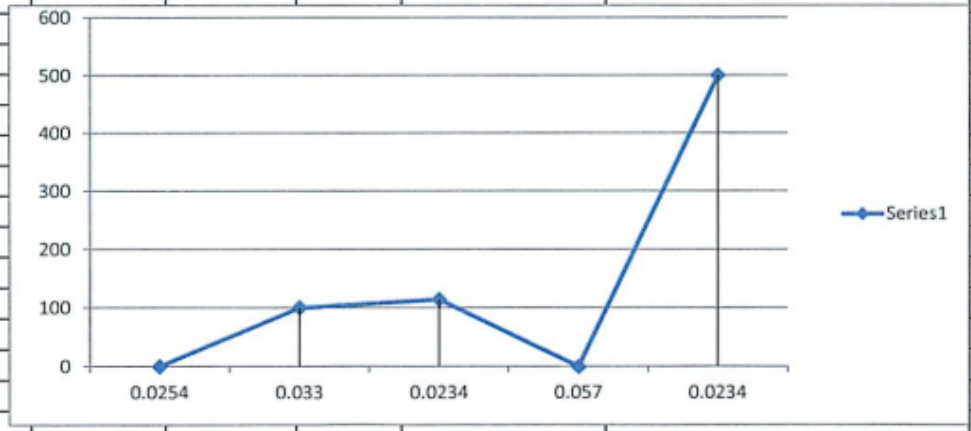
Testing

Russian Scientific Lab Results

Коэффициент теплопроводности материалов SPI по результатам применения в России.

Наименование объекта	Предмет изоляции	Материал	Ду, мм	Токр.ср.	Тнеизол.	Тиз.,°С	δиз.,мм	λ, (Вт/(м°С)) W/m K	ΔT, °С
Name of company and city	Object of insulation	Ins. Mat.	OD., mm	T amb., °C	T no ins. °C	T ins., °C	Ins. Thickness, mm	Ins. Conductivity, W/mK	ΔT, °C
Магнитогорск, МП "Трест Теплофикация", котельная	Трубопровод / pipe	HSC	500	20	97.3	54.1	3	0.0234	43.2
ОАО "УралХимМаш", котельная	Трубопровод / pipe	HSC	114	19.5	164	64	5	0.0234	100
Тепловой узел Кагальницкого молзавода, Ростов	Трубопровод / pipe	HSC	32(50)	26.9	125	62	4	0.0254	63
Новошахтинск, ГБ № 1	Трубопровод / pipe	HSC	100	0	59	15	4	0.033	44
Газпром добыча Ямбург	Фасонные части	HPC	-	25	151	71	7.5	0.0376	80
Газпром Трансгаз Самара	Фасонные часть	HPC	-	98	394.4	140	7	0.011	254.4
Газпром Трансгаз Самара	Фасонные часть	HPC	-	98	394.4	110	20	0.0075	284.4
Астрахань	Трубопровод /pipe	HSC	159(5)	3	68	27	5	0.057	41





Testing

Without coating, the heat loss touches 3409 W/m. With Hot Pipe Coating it diminishes to 776 W/m, i.e. a decrease with 77.3%. The average thermal conductivity in the coating then reaches 0.088 W/(m.K).

Mean temperature °C	Thermal conductivity W/(m.K)
-10	0.059
0	0.060
10	0.061
20	0.062
30	0.063
50	0.066
100	0.071
200	0.083
300	0.094
400	0.106
500	0.117

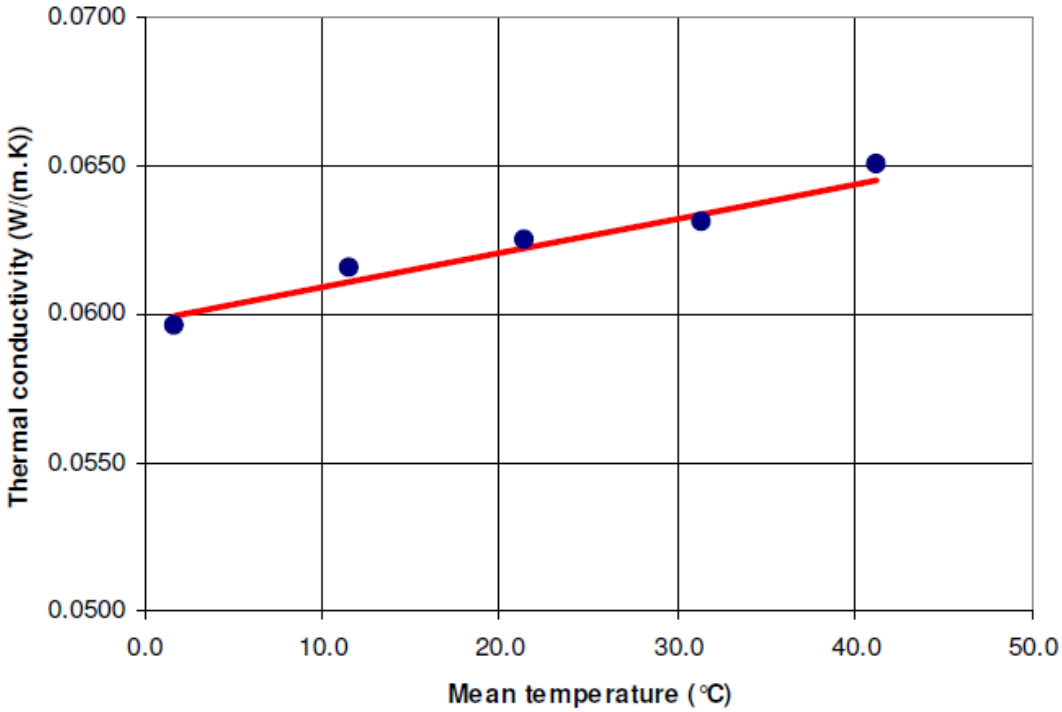
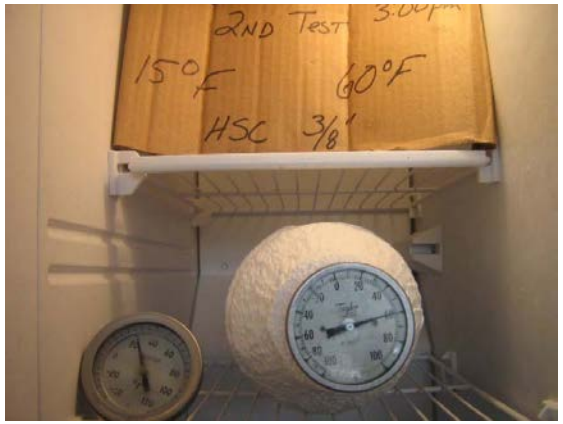


Figure 4 Relation between the thermal conductivity of Hot Pipe Coating and its average temperature

Cold Testing

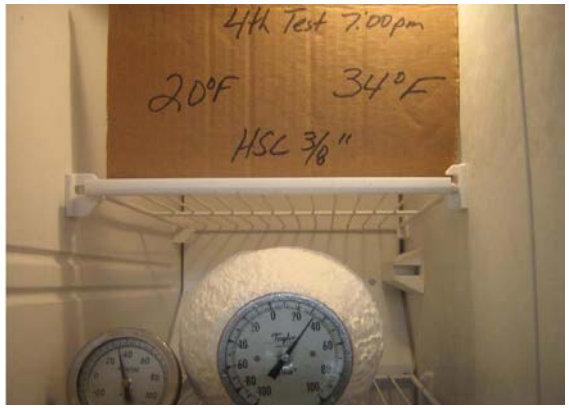
84 F – 1 P.M.



60 F – 3 P.M.

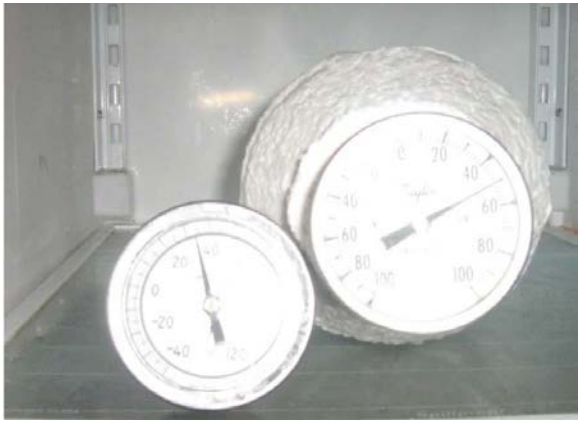
41 F – 5 P.M.

Cold Testing



34 F – 7 P.M.

33 F – 9 P.M.



33 F – 12 A.M.

Gazprom

30MM Thickness

Incinerator Before: 180℃

Incinerator After: 50℃

Flange Before coating: 185℃

Flange After coating: 55℃

International Paper

Tank Terminal, Belgium

La Defense Office, France

Advantages

- NO Shutdown Required
- Applied directly on hot pipes

Advantages

- Applied directly on valves and elbows

Comparison

Rockwool / Fiberglass	HPC®
INSTALLATION	
Shutdown during install and repair	SIMOPS
INSULATION EFFECT	
Deteriorates when wet. Valves and elbows not wrapped effectively	Insulates permanently. Insulates Valves and Elbows
CRACK DETECTION	
Entire jacket must be removed	Inspected directly on spot. Easily repaired
CONDENSATION	
High due to wetting of Fiberglass / Rockwool	No condensation for HPC®
CORROSION	
High due to condensation problem	No condensation = no corrosion
REPAIR AND MAINTENANCE	
High maintenance. Must shut down. High cost	Low. Sprayed without shut down. Low cost

Return on Investment

ASHRAE formula: (Org. Temp X Difference/24=tons of energy X 12,000 BTU per ton = BTU savings.

1. Readings:	**Surface of metal**	Surface of HPC	**BTU savings (Use formula above)/hr.**
	A. 500F(260C)	160F (71C)	85,000,000/hr.
	B. 838F(448C)	315F (157C)	219,137,000/hr.
	C. 1000F(538C)	315F (157C)	342,500,000/hr.

Change BTU into KW to find **COST SAVINGS** per hour / day/week/month/year. (1 BTU = .293 WATT)

A. 85,000,000 BTU/hr. X .293 Watt = 24,905,000 Watts divide 1000 = 24,905 KW/hr
In Kansas City (0.08cents/KW) or 24,905 X .08 **=$1992.40/hour**
$47,817/day---$1,434,528/ month --- $17,214,336/ year.

B. 219,137,000 BTU/hr X .293 Watt = 64,207,141 divide 1000 = 64,207 KW/hr
(0.08cents/ KW) or 64,207 X .08 = **$5136.57/ hour**
$123,278/day---$3,698,331/month---$44,379,976/year.

C. 342,500,000 BTU/hr X .293 Watt - 100,352,500 divide 1000 = 100,352 KW/hr
(0.08cents/KW) or 100,352 X .08 **= $8028.16 /hour**
$192,675.84/day---$5,780,275/month---$69,363,302

SUMMARY Savings per year:

A. $17,214,336
B. $44,379,976
C. $69,363.302

Contact Us

EAGLE
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SPI
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" Painting the World One Gallon at a Time "