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Interoffice Correspondence

DATE: November 20, 1986

TO: Jim Cole, Mahendra Lal, Narendra Master, Keith Vriend, Gary West

CC: Harold Beck, Norm Beck, Dan DeMaria, Mike DiFlora, John Gephart, Sonny Sundaresan

FROM: Howard Stepler/Ron Watkins

SUBJECT: Nonasbestos Gasket Material--Sealed Tube Tests (SF-0116)

Ref: (1) CLWR Number 741
(2) IOC of November 13, 1986, from J. O'Keefe, "Nonasbestos Gasket Test Results and Recommendations"

ABSTRACT

The candidate nonasbestos gaskets (Tables I and II) are compared with the current production Lydall "Duroid 3102", Klinger "Oilit," and Reinz "Thermolit K" gaskets. Acceptable gaskets, based on sealed tube compatibility criteria, are:

- VictoPak #69 -- best
- Boise #DL2-238 (nonsulfurized version) -- acceptable
- Armstrong #N8092 -- acceptable
- Lydall #CTRG-9200 -- least acceptable

The others on the list are not acceptable.

PURPOSE

Determine the reactivity of various nonasbestos gasket materials (Tables I and II) selected for evaluation by Jim Cole and Keith Vriend.

RESULTS AND CONCLUSIONS

The nonasbestos gaskets best suited for a refrigerant/oil environment (as determined by the sealed tube method) are those exhibiting less refrigerant degradation and less corrosion of the copper and steel coupons than current production gaskets. The

SEALED TUBE DATA

TABLE II
REACTIVITY

REF. NO.	% R-12 DEGRADED 3-DAY	% R-12 DEGRADED 14-DAY	TEST COUPONS** STEEL (14-DAY) LIQUID	STEEL (14-DAY) VAPOR	COPPER LIQUID	COPPER VAPOR	LIQUID PHASE*	
1	0.091	1.414	3.75	3.25	2.50	3.75	1.25	
2	0.300	1.231	4.00	3.25	4.00	4.00	1.00	
3	0.388	1.293	3.25	2.75	4.00	3.75	1.50	
4	0.606	3.925	3.75	3.50	4.00	3.50	1.00	cloudy
Kc Oil 5	0.067	2.456	4.00	3.75	4.00	4.00	2.50	cloudy
L 9200 6	0.566	1.670	4.00	4.00	1.75	1.75	2.25	
Leinz 7	0.023	1.288	4.00	3.25	3.75	3.50	1.25	
8	0.063	5.269	4.00	3.00	4.00	2.50	1.50	cloudy
9	0.150	0.790	4.00	3.50	4.00	3.75	4.00	BLACK !
10	0.256	1.169	3.00	3.25	4.00	4.00	1.00	slightly cloudy
11	0.243	1.373	3.50	3.25	3.00	2.75	1.50	
V-69 12	0.017	0.173	2.25	0.50	2.00	3.00	0.75	

[1]Gasket made without calcium or allum
[2]Original gasket baked at 280°F for 20 minutes
[3]Gasket made without sulfur curing component

* No description indicates a transparent, colored liquid

** Steel, copper, or liquid phase changes
0.00 = no apparent change from starting appearance
4.00 = heavily coated or tarnished metal coupons; blacking or coking of the oil

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SEALED TUBE DATA

TABLE I
PHYSICAL DESCRIPTION
(14-DAY ONLY)

REF. NO.	MATERIAL	STEEL
1	Armstrong #N8092	tarnished & crystal growth
2	Boise #DL2-238	tarnished & crystal growth
3	Boise #DL2-238[1]	tarnished & crystal growth
4	Duroid 3102	copper plating & crystal growth
5	Klinger "Oilit"	tarnished & copper plating
6	Lydall #CTRC-9200	crystal growth
7	Reinz "Thermolit K"	tarnished & copper plating
8	Armstrong #TN-9005	tarnished & crystal structure
9	Boise #NI-2085	tarnish & crystal growth
10	Boise #DL2-238[2]	tarnished & crystal growth
11	Boise #DL2-238[3]	tarnished
12	VictoPak #69	some crystal growth

[1]Gasket made without calcium or allum
[2]Original gasket baked at 280°F for 20 minutes
[3]Gasket made without sulfur curing component

COPPER

tarnished
flaking copper sulfide
flaking copper sulfide
tarnish & white crystal growth
grey to white tarnish
copper is dull
crystal growth
beige to brown crystal growth
flaking copper sulfide
flaking copper sulfide
blue tarnish
grey to blue tarnish

current production gaskets used for comparison are Lydall "Duroid 3102", Klinger "Oilit," and Reinz "Thermolit K." Acceptable gaskets are VictoPak Number 69, Boise Number DL2-238 (nonsulfurized version), Armstrong Number N8092, and Lydall Number CTRC-9200. The others on the list are **not** acceptable.

Ron Watkins

Ronald Watkins

Howard Stepler

RW:shm

Attachments