

Different types
of Monitoring
Equipment
All Conoco

PASSIVE MONITORS

VVC 000009843



Conoco Chemicals Company
A Division of Conoco Inc.
15990 North Barker's Landing Road
P.O. Box 19029
Houston, TX 77224

May 14, 1982

Mr. Frank Snowden
3M Company
230-B 3M Center
St. Paul Minnesota 55144

Dear Frank:

As we discussed today, enclosed is an abstract of our internal report and the tabulated data from our evaluation of the 3520 OVM. As agreed, it is our understanding that this data will be held confidential as to source.

We appreciate the opportunity of working with 3M in evaluating the 3520 and trust that such cooperative efforts will continue.

Sincerely,

A handwritten signature in cursive script, appearing to read "Thomas G. Grumbles".

Thomas G. Grumbles, Director
Industrial Hygiene

ajo

Enclosure

cc Paul Fetzner

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1. The field study portion included personnel testing during the initial shutdown phase of a plant maintenance turnaround, vinyl chloride tank car loading operations and miscellaneous work functions during normal plant operations. These data are summarized in Table I.

During the field study seven valid samples, according to Ws/Wp ratio, were obtained on the twenty-five testings conducted. In examining the field study data, it is interesting to note that in the presence of ethylene dichloride (EDC), more vinyl is found on the secondary wafer than on the primary. Little or no EDC was ever found on the secondary wafer as indicated by the Ws/Wp ratio.

The vinyl chloride concentration shown for the two monitors agreed within 0.1 ppm on 14 of 25 samples. Only 4 of the 12 turnaround maintenance samples were in this group. The data appears to indicate that EDC displaced the vinyl chloride component from the primary badge back to the atmosphere in the #3500 monitor and onto the secondary section in the #3520 monitor.

The data for the standards study conducted in the laboratory are shown in Table II and graphically represented in Figure I for vinyl chloride and in Figure II for EDC. These data substantiate the observation made from the field data concerning EDC in that it remains on the primary absorbent wafer. Our standards data for vinyl chloride supports the study conducted by 3M and shows how rapidly the vinyl chloride is transferred to the secondary absorbent or eliminated to the atmosphere.

This study indicates that for a combined gas, 8.20 ppm mole vinyl chloride and 9.8 ppm mole EDC, the #3520 provides a valid sample for at least 6 hours, Figure I. It appears that the single badge, #3500, began losing the vinyl chloride almost immediately when compared to the corrected value for the #3520 dual wafer badge.

Additional work will be required with lower concentration standards to determine where it becomes practical to use the #3520 monitor in place of the #3500 monitor.

TABLE I
FIELD STUDY COMPARISON
3-M #3500 AND #3520 BADGES
VINYL CHLORIDE AND ETHYLENE DICHLORIDE

Sample No.	Sample Time-Min.	PPM VCM			PPM EDC		
		#3500	#3520	$\frac{W_s}{W_p}$	#3500	#3520	$\frac{W_s}{W_p}$
a	500	0.33	0.89	1.08	3.11	3.74	0
b	475	0.06	0.89	1.47	3.00	3.79	0
c	465	0.07	0.13	0.84	22.66	24.25	0
d	465	0.23	0.27	0.33	7.81	8.72	0
e	480	0.04	0.13	1.48	17.17	16.79	0
f	490	0.26	0.59	0.78	31.71	31.79	0
g	450	0.14	0.45	1.12	11.57	11.96	0
h	450	0.06	0.19	1.61	9.70	9.54	0
i	440	0.17	0.62	1.59	46.38	23.80	0
j	440	0.06	0.25	2.47	100.40	20.58	0.01
k	480	0.05	0.10	1.18	13.20	13.89	0
l	480	0.03	0.07	1.80	5.08	4.78	0
m	445	N.D.	N.D.		N.D.	N.D.	
n	450	N.D.	N.D.		N.D.	N.D.	
o	420	0.21	2.34	8.95	N.D.	N.D.	
p	470	N.D.	0.11	0	N.D.	N.D.	
q	410	0.14	0.21	0.65	1.10	1.00	0
r	495	<0.01	0.16	0	0.36	0.44	0
s	450	0.09	0.15	0.16	0.17	0.23	0
t	470	0.04	0.04	0.33	N.D.	N.D.	
u	450	0.01	0.01	0	0.40	0.37	0
v	450	0.02	0.06	0.67	0.13	0.49	0.81
w	480	0.02	0.04	1.09	1.57	1.37	0
x	490	0.04	0.05	0.46	1.93	6.17	0
y	450	0.04	0.07	0.53	0.81	0.91	0

N.D. - Not Detected

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TABLE II
LABORATORY STUDY COMPARISON
VINYL CHLORIDE AND ETHYLENE DICHLORIDE STANDARDS
3M #3500 AND #3520 BADGES

<u>Time Samples</u>	<u>VCM AREA</u>					<u>EDC AREA</u>				
	<u>#3500</u>		<u>#3520</u>			<u>#3500</u>		<u>#3520</u>		
	<u>Single</u>	<u>Front</u>	<u>Back</u>	<u>Correct Total</u>	<u>Ws/ Wp</u>	<u>Single</u>	<u>Front</u>	<u>Back</u>	<u>Corrected Total</u>	<u>Ws/ Wp</u>
360	666,271	527,397	159,806	879,470	.30	75,307	72,628	0	72,628	0
240	530,436	442,349	71,324	599,262	.16	55,654	51,749	0	51,749	0
125	27,990									
120	257,706	241,421	23,974	294,163	.10	26,302	24,638	-	24,638	0
60	134,303					13,540				

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FIGURE I
VCM COMPARATIVE DATA

DIETZGEN GRAPH PAPER
20 X 20 PER INCH

NO. 3-1-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

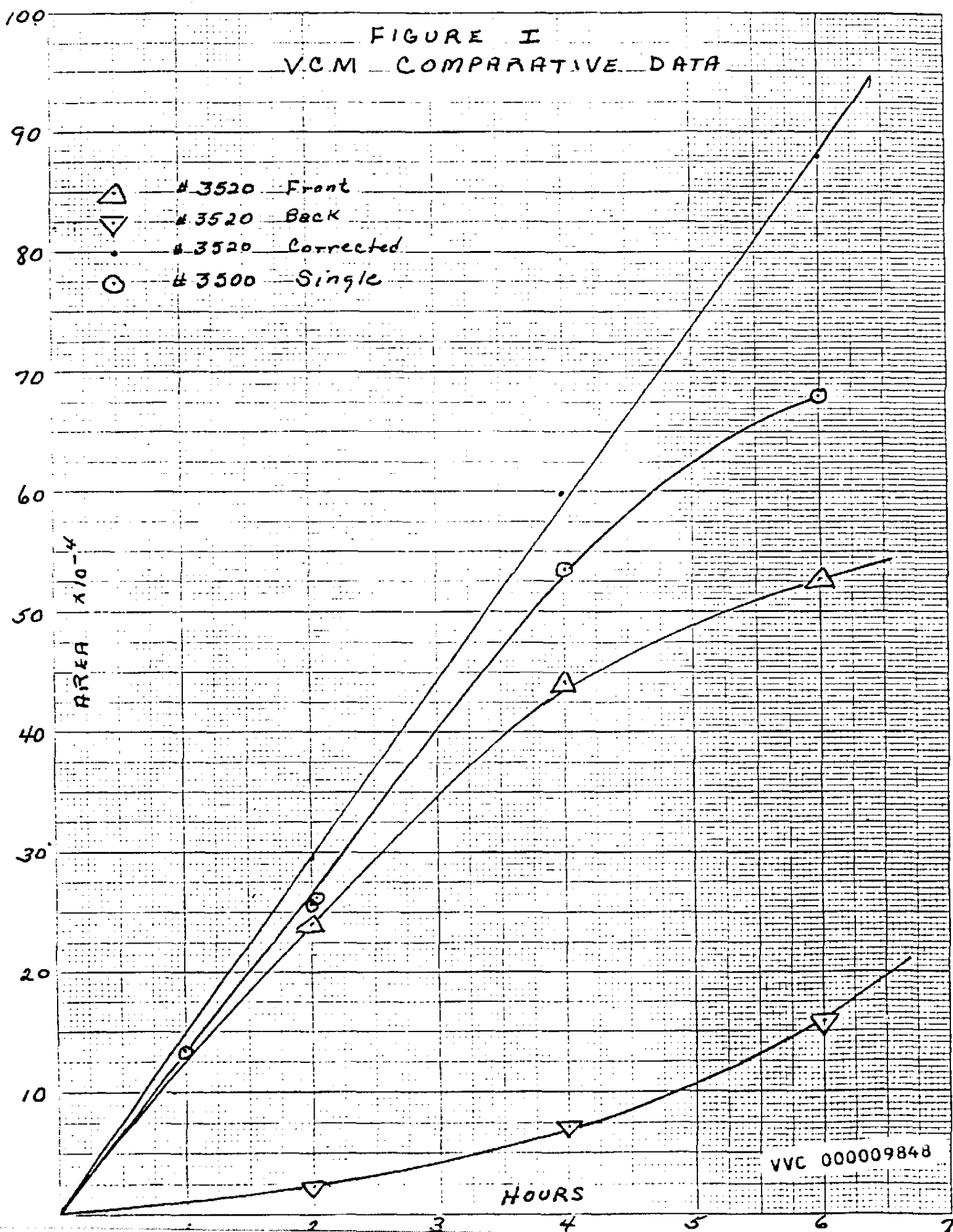
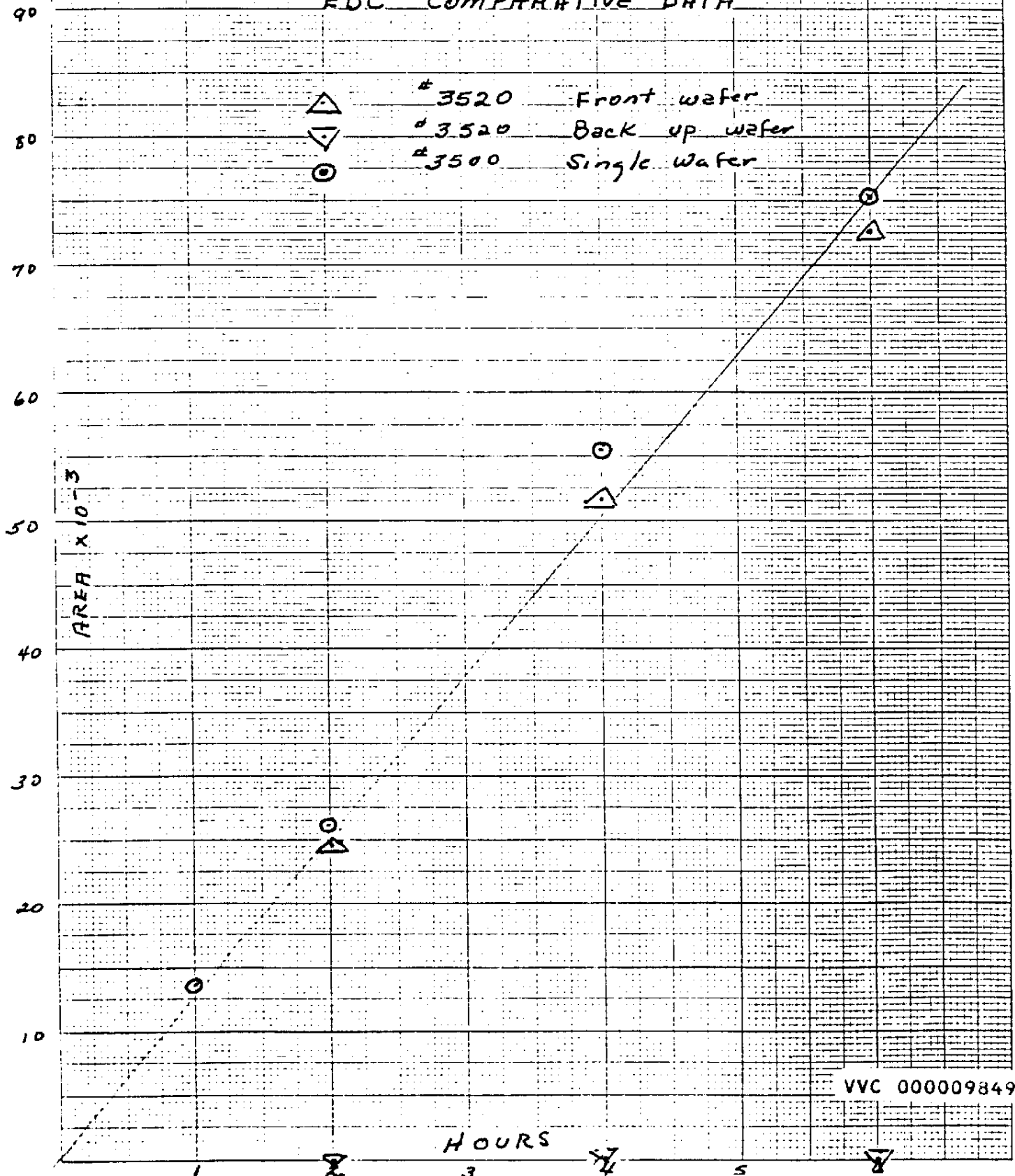


FIGURE II

EDC COMPARATIVE DATA



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