

Smoke

4/9/74

Analysis of Residual Vinyl Chloride Concentration Data
From Model Fluidizer

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Vapor Equil., ALTC	1.9%

This means that at a 2000 ppm concentration, for example, S_{test} for the vapor equilibrium method at ALTC would be about 38 ppm, while at a 200 ppm concentration, S_{test} would be about 3.8 ppm.

Significant differences were found between the concentrations detected for the 3 analyses. For example, average initial concentrations of residual vinyl chloride detected by the 3 methods are:

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Solvent, ALGC	2365.5
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Additionally, the average differences between the methods significantly varied, as indicated by comparison of the above initial concentrations with the 335 minute concentrations.

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Solvent, ALGC	189.0
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Note that the solvent method now detects the least amount of VCl, while initially it detected the most.

Thus, we can say that the 3 methods significantly differ in the concentrations of vinyl chloride detected. The solvent method gives generally higher results (although not always) than the vapor equilibrium method as run at ALGC, which in turn gives higher results than the vapor equilibrium method as run at ALTC. S_{test} is approximately the same for each method.

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MINUTES

AMBIENT VINYL CHLORIDE STANDARDS COMMITTEE MEETING

Cleveland Office

April 9, 1974

PRESENT:

C. R. Flynn	L. B. Crider
E. G. Schwaegerle	A. M. Fairlie
<u>W. J. Wilcox</u>	E. W. Harrington
J. W. Gressler	G. H. Metzger
J. M. Whitney	G. D. Schaaf

1. The status of the Bendix installations are as follows:

Louisville has two complete units installed; one in Building 15 and one in Building 121. The remaining two Bendix units will be installed as soon as the sampling systems arrive (Shipped on March 29, 1974).

Henry has now completed their installation, and it is working very satisfactorily.

The Bendix unit for the mass plant at Pedricktown is installed and working satisfactorily. The instrument for the pearl-paste building has been shipped and the sampling system is under construction.

Long Beach has received the Bendix systems but they are not installed.

Avon Lake has two Bendix systems completely installed - the original one in Building 451, and a new one in Building 461. Two more Bendix units have been shipped to Avon Lake and two more sampling systems are under construction and will be shipped soon from Bendix.

Shawinigan (Canada) has received one Bendix instrument and the sampling system is being constructed.

The Welland plant (Canada) lost their instrument in customs, but it is now being traced. Their sampling system is also under construction.

The target date for completion at Bendix of the five remaining sampling systems is April 25, 1974.

The fifth Bendix system for the Louisville plant will be shipped to Avon Lake for interim use. This is the equipment that was ordered for the large poly installation.

2. The mini computer EA for the Avon Lake General Chemical plant is currently being rewritten. The interfacing equipment has been placed on order since

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it is the longest delivery item. It is expected the EA write-up will be completed the week of April 15th. This will include provisions for alarms at three levels of vinyl chloride concentration -- 30, 50, and 200 parts per million. Suitable EA's for Louisville, Henry, and Long Beach will be prepared in Cleveland on an individual plant basis.

3. John Whitney presented a report on the test methods for residual vinyl chloride monomer in PVC resins. The details of his report are included in the attachment. The standard procedure is now being written for the solution method to measure residual vinyl chloride content of PVC. This procedure should provide more uniformity from sample to sample and plant to plant. We now have identical chromatographs and equipment at the following locations: Avon Lake Technical Center, Avon Lake General Chemical plant, Henry, and Louisville. Equipment for the Pedricktown and Long Beach plants will be available soon. John Whitney will arrange for a statistical round robin study to define the plant-to-plant bias with the new test procedure.

The Berens-Tomanek test method looks very promising and will be integrated into the plant operation only when it is completely evaluated.

4. E. Katzenmeyer has conducted personnel monitoring studies at the Avon Lake plant and is now in Louisville conducting studies there. Generally, good agreement with personnel monitoring and the Bendix data have been obtained. A total of 41 pumps have been ordered for personnel monitoring work at all plant locations. The pumps will be sent out to each plant for their use. The Plant Manager will assign one man in each plant to work on the personnel monitoring program. The man assigned to personnel monitoring will be trained in the technique in a training session to be held at the Technical Center.

Each plant will be provided with four pumps for personnel monitoring. Three pumps will be in use at one time and one pump will be kept for a spare. It is planned to monitor three different job classifications in a given building each day. Since the actual monitoring requires four hours, it would be possible to get a building completely finished in one day. For the large plants with multiple buildings, one building per day can be monitored such that each building will be monitored at least once a week. This will continue for a period of three weeks as specified by the OSHA standards. After the initial three-week monitoring is completed, then a decision will be made concerning what periodic and systematic monitoring will be required.

5. The question of continuing with the NIOSH standards for PVC polymerization plants was discussed in light of the new OSHA emergency temporary standards. It was agreed that B. F. Goodrich will continue to live with the NIOSH standards. Questions concerning individual plant interpretation should be directed to H. Waltemate or J. Gressler. In the case of removal of PVC dust from overhead structures, this will be done at least once and the cost reviewed before setting the frequency for recleaning.
6. A letter will be issued to all plants by A. M. Fairlie detailing how the Bendix data should be handled in the interim period before the mini computers

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visually appears to be in solution. Then mix for at least one more hour. Samples should be left on the shaker till they are used. The back flushing step has been modified to keep the second column clear of solvent.

- 5) Cross checks run on resin should be run on non-porous resins to minimize sample changes. If porous resins are required, then they should be "glass sealed" in ampules.

A recent cross check between Avon Lake G. C. and Pedricktown on a special sample of 80X5 resin produced the following results:

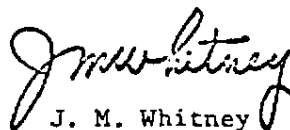
	<u>1st Run</u>	<u>2nd Run</u>
Avon Lake	3529	3716
Pedricktown	3316	--

With careful standardization of this solvent method we certainly have indications that the reproducibility can be brought to an acceptable level. It is unfortunate that this method has seemed to gain a "bad reproducibility" reputation simply because each plant rushed into it faster than the method could be completely developed and standardized.

- c) The most recent method evaluated is the vapor equilibrium method proposed by A. Berens. C. Tomanek (ALTC) worked on this technique and was able to obtain excellent reproducibility. He then assisted the ALGC laboratory in setting up to run this method. Run number 3 of 80X5, graph and data attached, illustrates the data obtained in this initial run. Although a few minor problems were encountered in the ALGC laboratory, the method seems to have much to offer.
- 1) Technique has fewer steps, consequently less chance for human errors.
 - 2) Calibration is easier than the solution method. It requires only known mixtures of VCM in air. These are generally available in each plant for OVA calibrations.
 - 3) This method is faster since it eliminates the solution preparation steps.
 - 4) No change in the chromatograph is required except possibly a slightly longer column. The integration system is equally applicable for both methods.
 - 5) This method would be somewhat easier to automate in the laboratory than the solution method.

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One word of caution at this point. Let's not repeat the experience of the solvent method. This method should not be turned over to all plants at this time. It should be promptly debugged and developed prior to considering it as a standard method. Another run on 80X5 is being made today at ALGC which will compare the different methods. C. Tomanek is working with ALGC in developing this method. We have tentatively scheduled a meeting with A. Berens for the week of April 15, 1974, to review the results obtained with this new method.


J. M. Whitney

JMW:d1
3 attachments

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Data Summary for Geon 80X5, Run No. 3

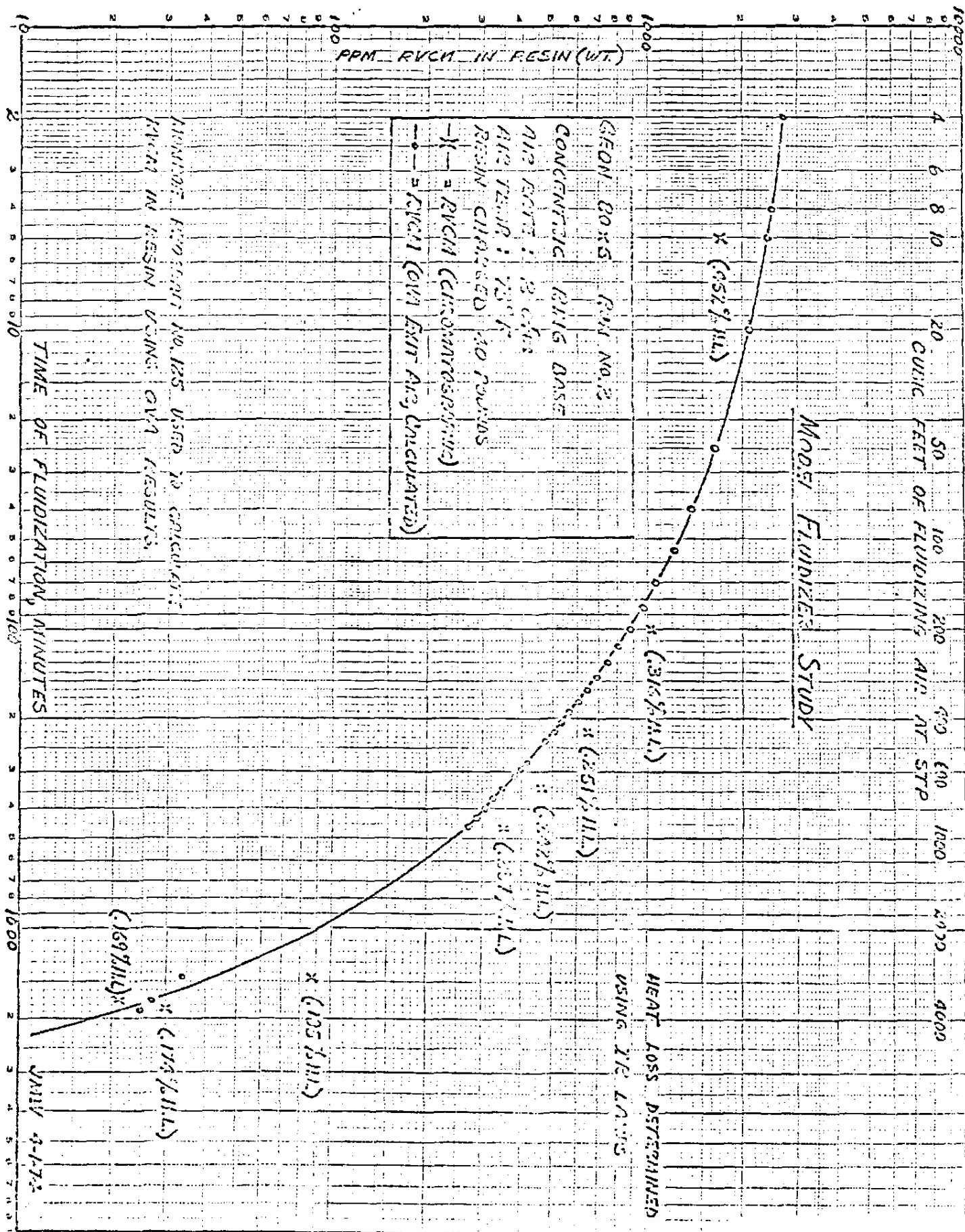
Sample	Solvent Method ALGC	V. Equil. Method ALGC	V. Equil. Method
1A-1	2368 ppm	2079 ppm	1659 ppm
-2	----	(1459)	1587
1B-1	2363	2126	1570
2	----	2194	1585
2A-1	2015	1707	(1191)
-2	----	1715	1453
2B-1	1995	1824	1501
-2	----	1820	1486
3A-1	869	780	724
-2	----	784	716
3B-1	902	790	692
-2	----	790	691
4A-1	433	407	357
-2	----	405	357
4B-1	433	409	358
-2	----	408	349
5A-1	198	232	209
-2	----	(306)	214
5B-1	180	232	209
-2	----	223	211
6A-1	29	----	----
-2	----	----	----
6B-1	30	----	----
-2	----	----	----

() indicates a probable error in sample injection

Samples 1A-1; 1A-2; 1B-1; 1B-2 represent samples taken at exactly the same time. Therefore, they should all have the same RVCN content.

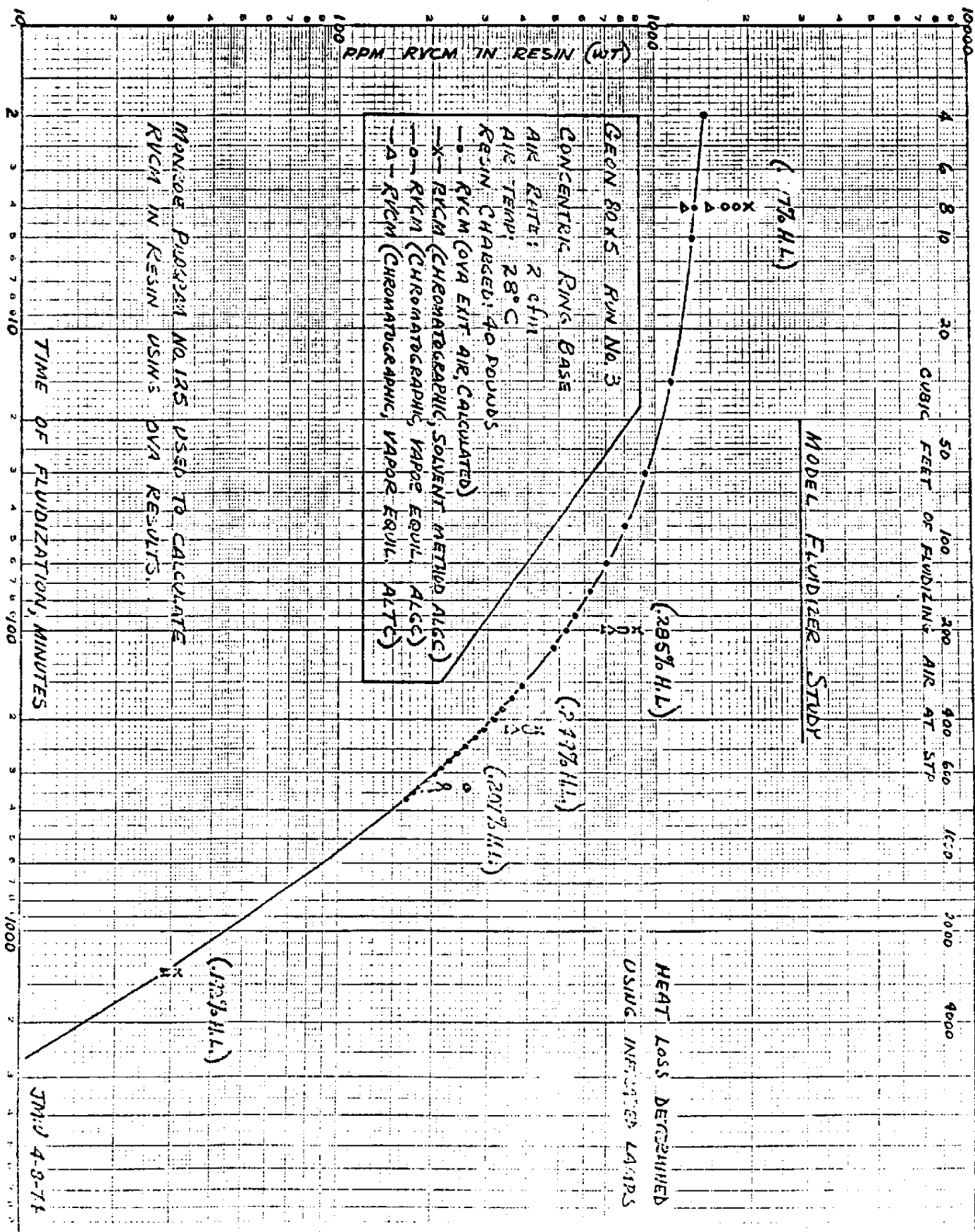
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