MONSANTO CHEMICAL COMPANY

FROM : St. Louis - Organic Research

DATE : December 31, 1964

SUBJECT : Inerteen PPO PDS-54201 KA Specifications

REFERENCE : Memos-L. Stark to E. Martin 12/22/64
-P. Benignus to W. Gresham 12/28/64

TO : P. E. Heisler
WGK

W. R. Gresham
D. M. Harris
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The reference memos have indicated a controversy with the subject fluid specifications. The purpose of this memo will be to present the historical and technical information which led to the current problem.

WGK Analytical Lab first prepared a blend of 70% (W) Aroclor 1254 and 30% (W) trichlorobenzene (TCB). A suitable viscosity (62 SUS) and pour point were obtained. A second blend was requested for determination of other properties. This blend had a low viscosity. At that time Research was requested by Marketing and Production to write a tentative process and set tentative specification limits. Since there was a discrepancy in viscosity between the two initial blends, Research obtained some of the same raw materials to prepare a blend and found a viscosity similar to the #1 WGK blend. As a further check independent raw materials on hand in Research were used to prepare three blends which represented a 70/30 mix of Aroclor 1254/TCB, a blend long on Aroclor and a blend short on Aroclor. Viscosity and refractive indices were run on these blends and found in agreement with the first WGK blend and the Research blend using WGK raw materials. Properties of these blends appear in Table I, Figure II, and Figure IV. Figure I and Figure III are refractive index and viscosity vs. concentration curves.

Tentative specifications were then set up using Research viscosity and refractive index values and the specific gravity value of the second WGK blend. The ranges chosen were equivalent to the ranges for similar properties of Inerteens currently being produced.

The first plant batch was blended and it was found that the viscosity and refractive index were inconsistent with the gravity. Research review of the data available indicated the specific gravity specification to be incorrect and it was recommended the batch be adjusted on the basis of viscosity. After four midnight adjustments, the lot was still somewhat low on viscosity and refractive index indicating slightly too much TCB. Marketing, Research, and Production discussed this and it was decided that the batch was not far enough out to delay shipment.

At that time Research was asked to resolve the specification discrepancies between specific gravity, refractive index and viscosity. Also, Production asked Research for an order of specification priority in case succeeding batches had conflicting values. My memo of 12/22/64 to E. Martin

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(copy to you) suggested a specific gravity change and an immediate order of priority. This was not acceptable to all concerned and has led to a further review of specifications on specific gravity, refractive index and viscosity. This is being done by both the Production laboratory and Research and should be complete by January 4 or 5 in time for analysis of the next production batch.

As additional information, Research has prepared the graph relating specific gravity vs. concentration (Figure V). This graph indicates further changes in the specific gravity are in order. This will be confirmed by the planned tests. This graph also indicates that wide concentration variations can be expected if specific gravity is used as a control. This is due to the wide gravity variation of raw materials.

L. R. Stark

L. R. Stark

jh
attachments

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TABLE I

Blend	Viscosity@100F CS	Viscosity@100F SUS	Sp. Gr. 15.5/15.5C	R.I. @25C
#1 WGK Lab Blend 70/30, 1254/TCB	10.88	62	-	-
#2 WGK Lab Blend ? 70/30 ?	7.73	51.2	1.516	1.6131
JDS, WGK Raw Materials 69.9 1254 29.9 TCB .2 PPO	10.58	60.95	-	1.6172
JDS, Res. Raw Materials 69.9 1254 29.9 TCB 0.2 PPO	10.20	59.61	1.5188*	1.6162
JDS, Res. Raw Materials 70.89 1254 28.9 TCB .21 PPO	11.13	62.9	1.5208*	1.6174
JDS, Res. Raw Materials 68.94 1254 30.87 TCB .20 PPO	9.69	57.85	1.5188*	1.6158

*LRS Gravities by Westphal balance prior to 12/22/64 memo.

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FIGURE I

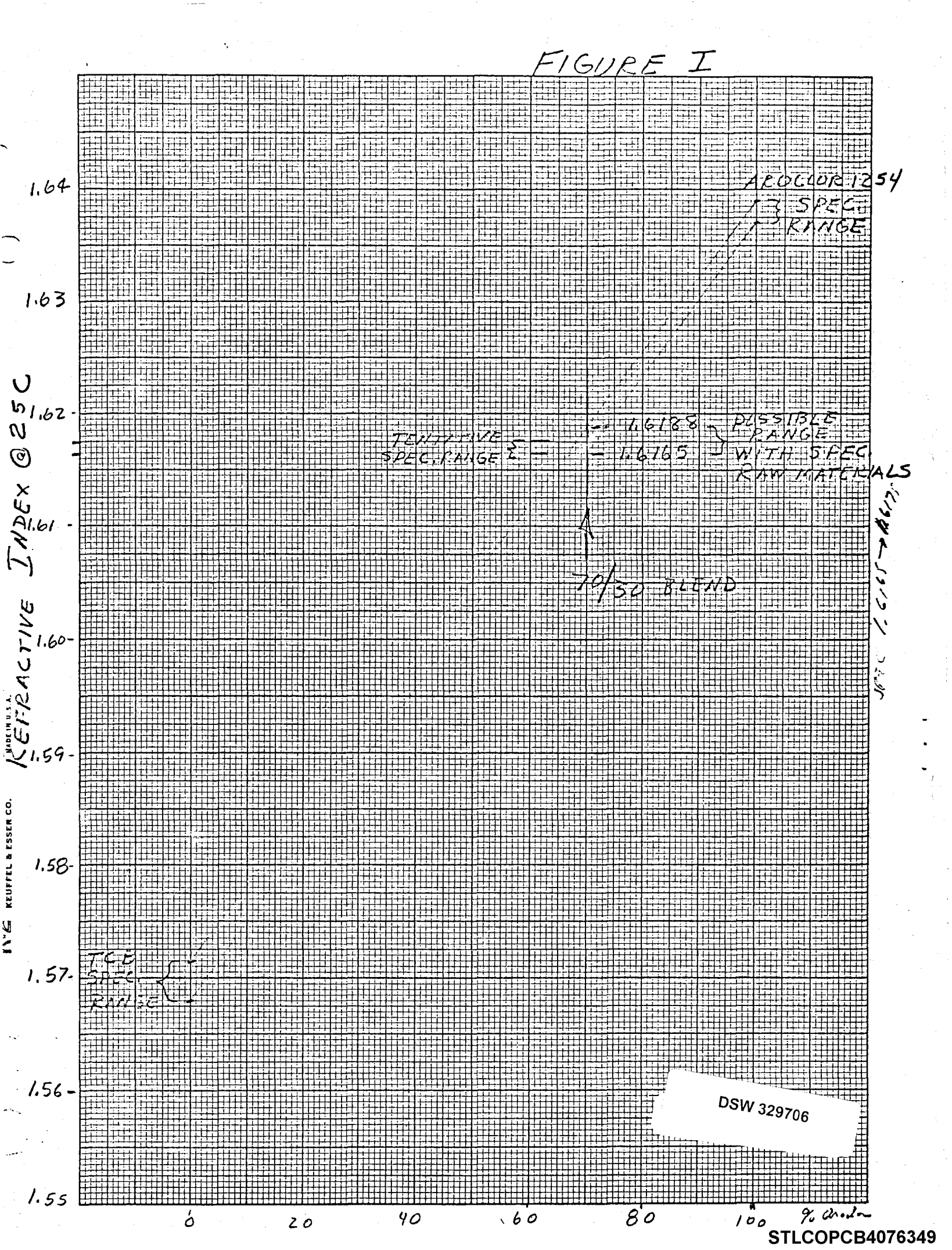

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FIGURE II

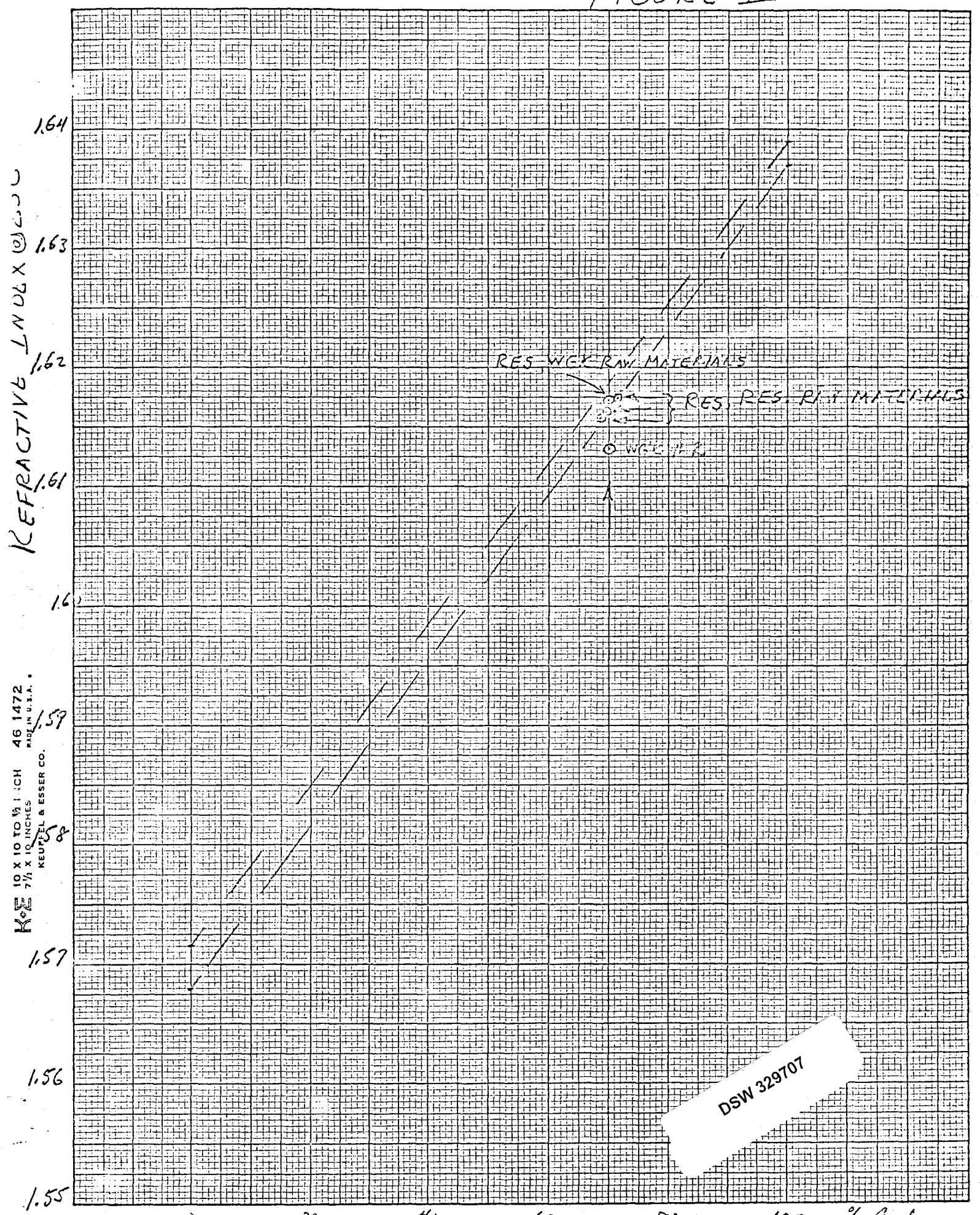

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FIGURE III

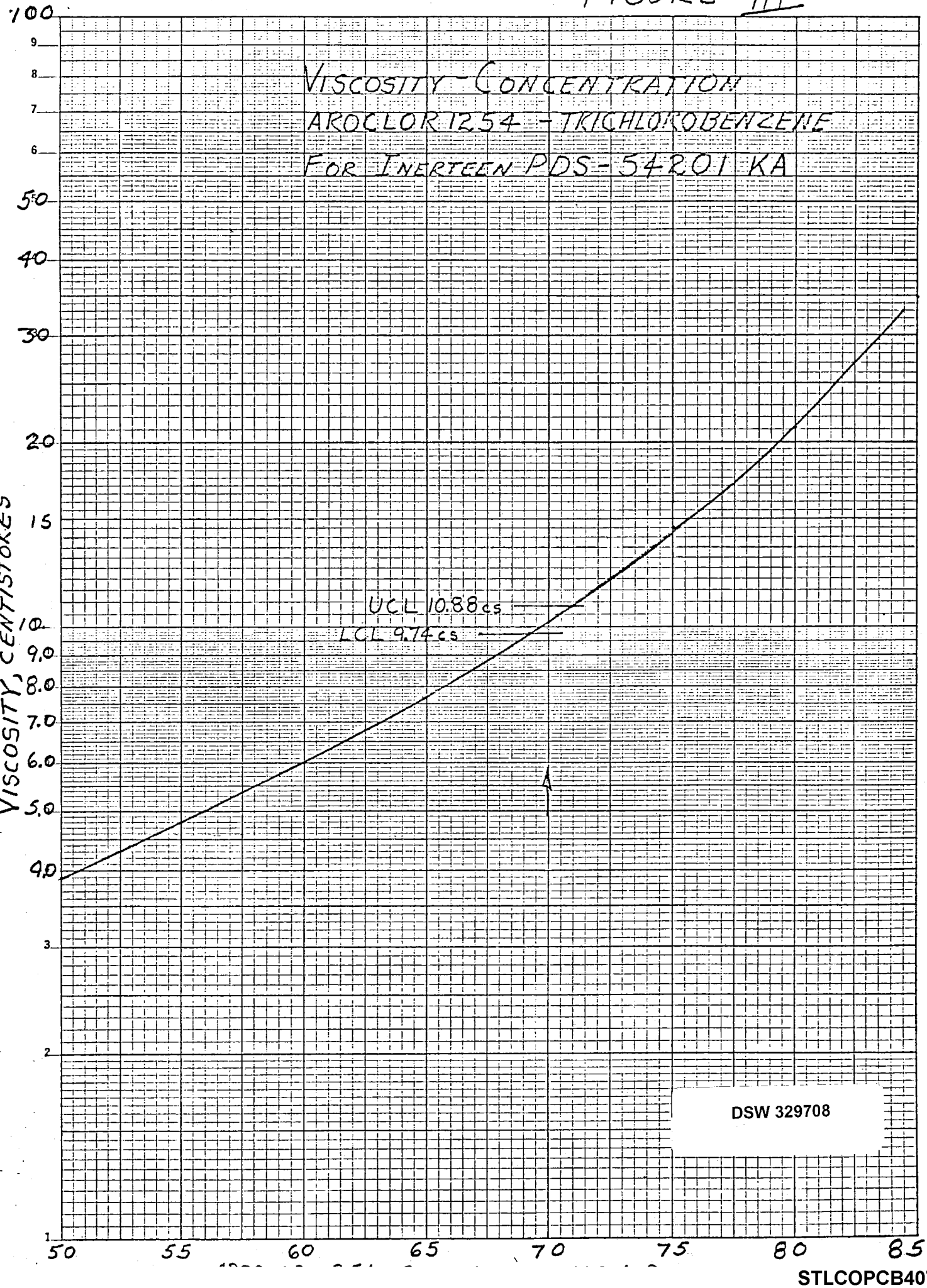

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FIGURE IV

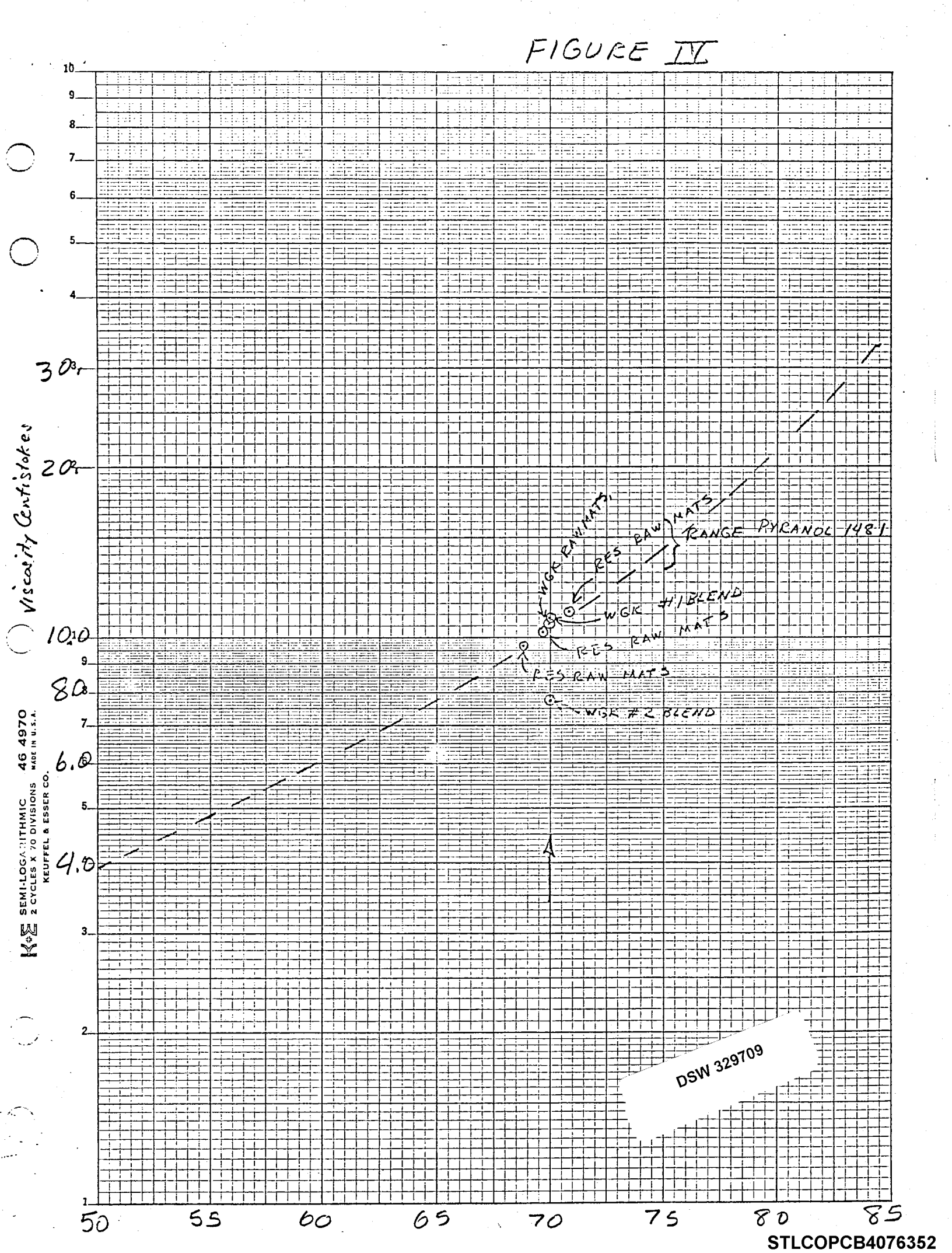

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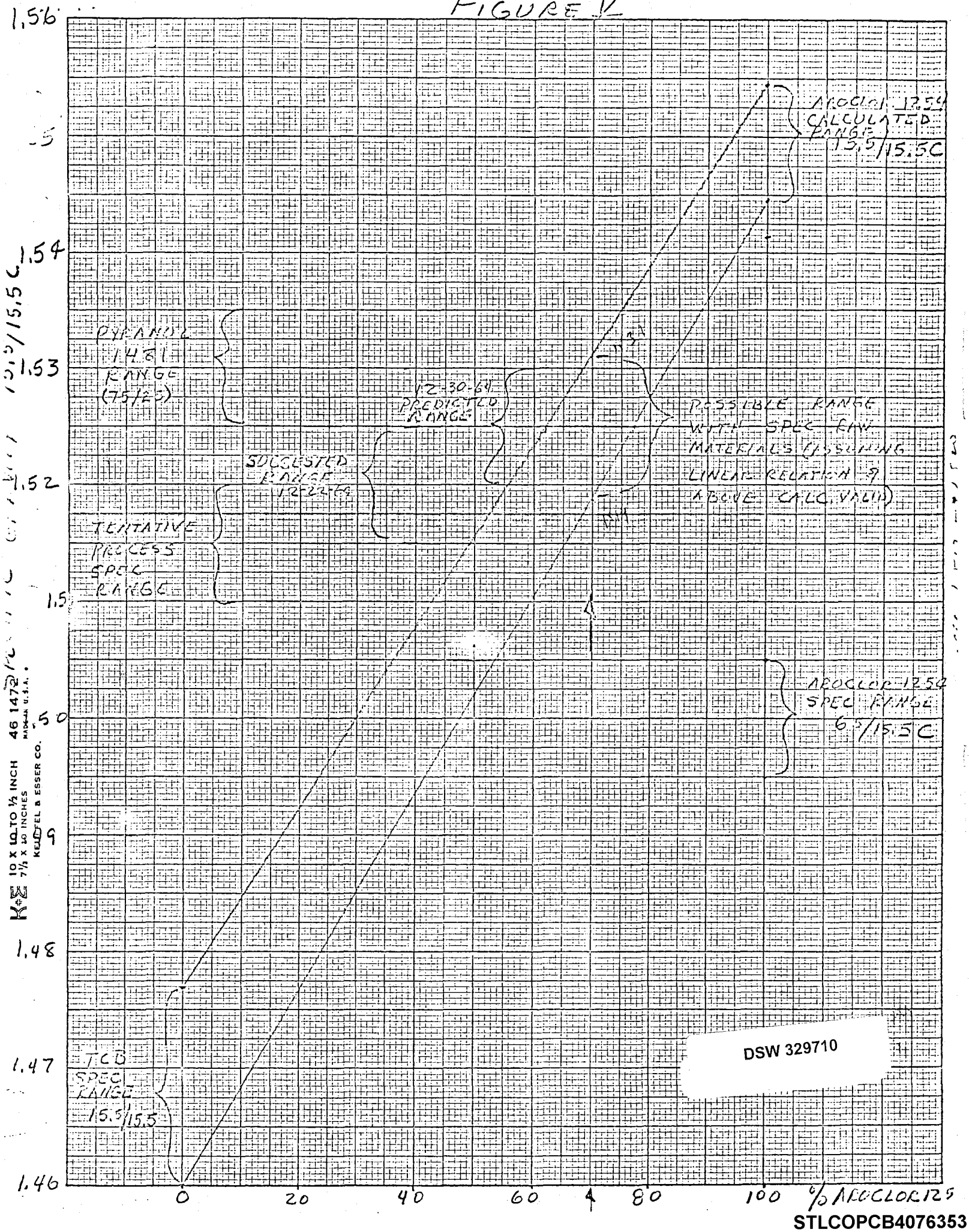
FIGURE V



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