QSOM-7

STATUS REPORT

VINYL CHLORIDE RESINS

PERFORMANCE CHARACTERISTICS OF ETHYLENE

MODIFIED VINYL CHLORIDE AND CONVENTIONAL POLY (VINYL CHLORIDE) RESINS

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Date: November 7, 1966

Project No: 224A90

File No:

SUMMARY

A comparison of the unfilled compound physical and processing characteristics of ethylene modified vinyl resins QSOM-7 Blend 3 and QXOM-7 QEX 1197 and a conventional homopolymer QYTQ-7 has been completed. The differences in ethylene levels:

QYTQ-7	-	0 percent
QXOM-7 QEX 1197	-	1.4 percent
QSOM-7 Blend 3	-	0.9 percent

shows that:

1. QEX 1197 (1.4 ethylene) requires 5 PHR (11 percent) less of FLEXOL plasticizer DOP than does QYTQ to achieve a Durometer A Hardness of 80; Blend 3 (0.9 ethylene) requires 2.5 PHR (5 percent) less.

2. The amounts of FLEXOL plasticizer DOP required to achieve constant melt characteristics are:

QYTQ	-	40.5 PHR
QEX 1197	-	32 PHR
Blend 3	-	38.5 PHR

3. The 1.4 percent ethylene level for a QSOM type resin is thus recommended to provide a more unique product to the calendering and flooring fields than that offered by the 0.9 percent level.

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INTRODUCTION

The compound physical properties of QXOM-7 QEX 1197 and QSOM Blend 3 vinyl chloride ethylene resins have been compared to QYTQ in three FLEXOL plasticizer DOP concentrations to assess the influence of different levels of ethylene on processibility and compound physical properties.

DISCUSSION

This study is designed to define the influences of both internal and external plasticization upon the ethylene modified version of QYTQ to assist in establishing product specifications. This report supplements previous [1] findings that QSOM Blend 3 required a lesser amount of external plasticization to achieve the same physical properties of QYTQ. The sample preparation techniques of the previous investigation [1] were utilized in this study which was designed as slightly less intense than the previous evaluation. The data are shown in Table I and Figures 1 and 2.

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(1) A. W. Conkling and P. T. McCoy, The Utility of Process - 11 Vinyl Chloride Resins in Flooring Applications, Research and Development Department, Status Report, April 22, 1966.

The various property and processing performances of QSOM-7 Blend 3 and QXOM-7 QEX 1197 are compared at equivalent plasticization to QYTQ-7 in the following summary table.

Property	Average Percentage Greater/Less Than QYTQ-7 QXOM-7 QEX 1197	QSOM-7 Blend 3
Durometer A	- 4	- 2
D	- 21	- 8
Tensile	- 6	- 3
Elongation	+ 3	+ 4
Apparent Melt Viscosity	- 13	- 1
Fusion Time	- 99	-73

The amount of plasticizer to obtain a Durometer A of 80 (plasticizer efficiency parameter) for these resins, follows:

QYTQ-7	- 47	parts
QXOM QEX 1197	- 42	parts
QSOM Blend 3	- 44.5	parts

This indicates that about 11 percent less plasticizer is required by QEX 1197 and about 5 percent less by Blend 3; QEX 1197 requires about 6 percent less than Blend 3.

The amount of plasticizer required to obtain an apparent melt viscosity of 1,500 meter grams per second (Plasti Corder) for these resins follows:

QYTQ	- 40.5	parts
QXOM QEX 1197	- 32	parts
QSOM Blend 3	- 38.5	parts

This indicates that QEX 1197 requires about 27 percent less plasticizer than QYTQ and that Blend 3 requires about 5 percent less; QEX 1197 requires about 22 percent less than Blend 3.

The higher fusion torques of QEX 1197 as compared to QYTQ and Blend 3 are possibly related to differences in resin-plasticizer solvency characteristics.

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Attachments - 1 Table
2 Figures

TABLE I

VINYL CHLORIDE RESINS

COMPOUND PHYSICAL AND PROCESSING PROPERTIES

Resin	Plasticizer Concentration phr.	Durometer "A"	Durometer "D"	Tensile Strength psi.	Ultimate Elongation %	Apparent Melt Viscosity m-g/sec	Apparent Melt Viscosity °C	Fusion Characteristics Time min.	Fusion Characteristics Temperature	Fusion Characteristics Torque m-g/sec
QYTQ - 7	20	98	74	3550	200	2400	158	4.7	114	4700
	40	85	40	3040	280	1540	149	11.4	120	2550
	60	70	23	2330	380	1050	144	13.2	114	1050
QXOM	20	95	65	3230	190	2210	156	1.2	98	5450
QEX 1197	40	81	30	2940	320	1360	148	6.5	110	3000
	60	67	18	2240	380	860	143	7.0	106	1900
QSOM	20	96	70	3340	200	2440	157	2.5	101	2440
Blend 3	40	83	35	2960	300	1490	149	7.2	109	1490
	60	68	22	2350	400	1020	144	7.2	106	1020

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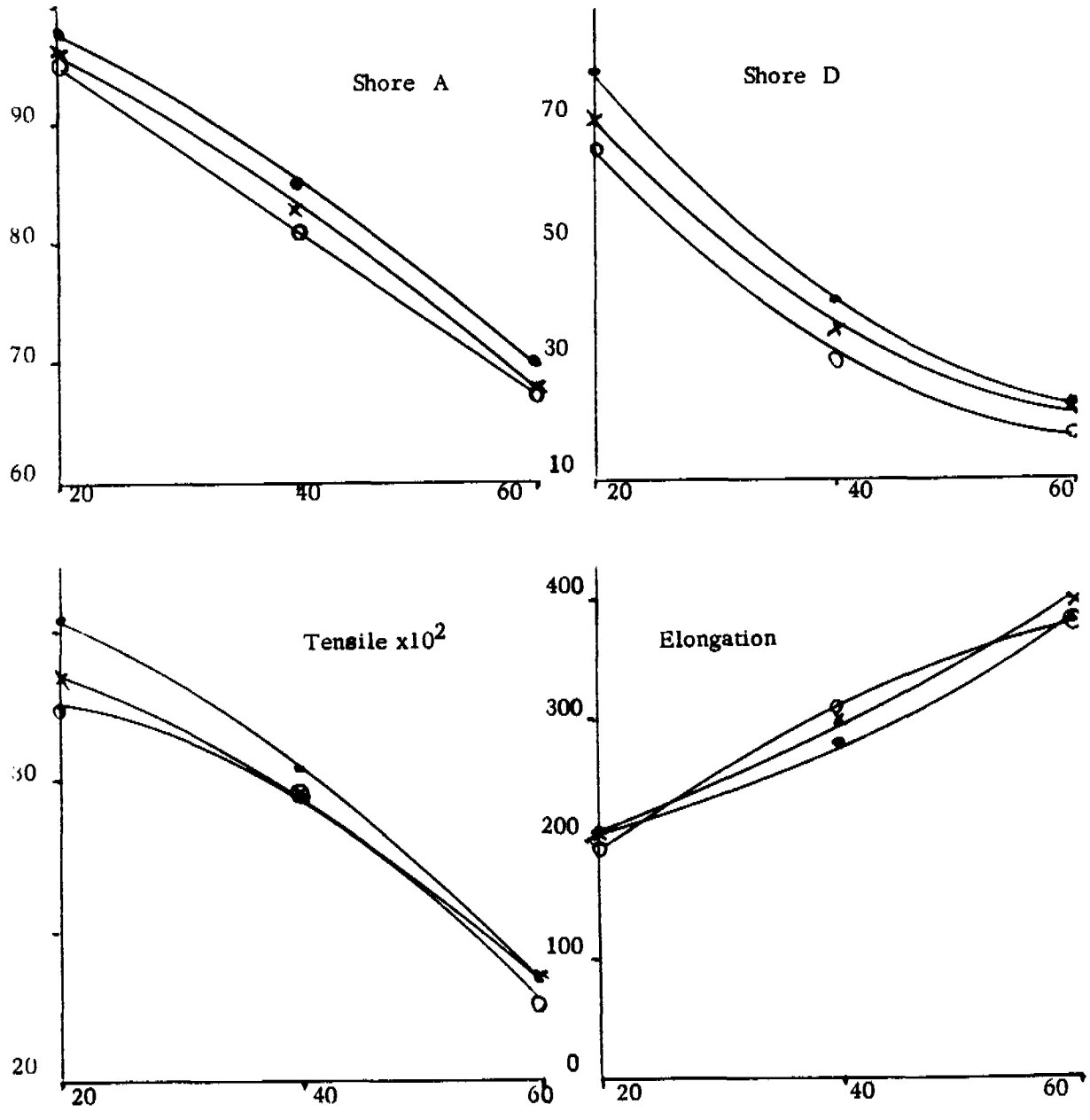
Figure I

Vinyl Chloride Resins
Unfilled Compound Physical Properties

• - QYTQ
o - QXOM QEX 1197
x - QSOM Blend 3



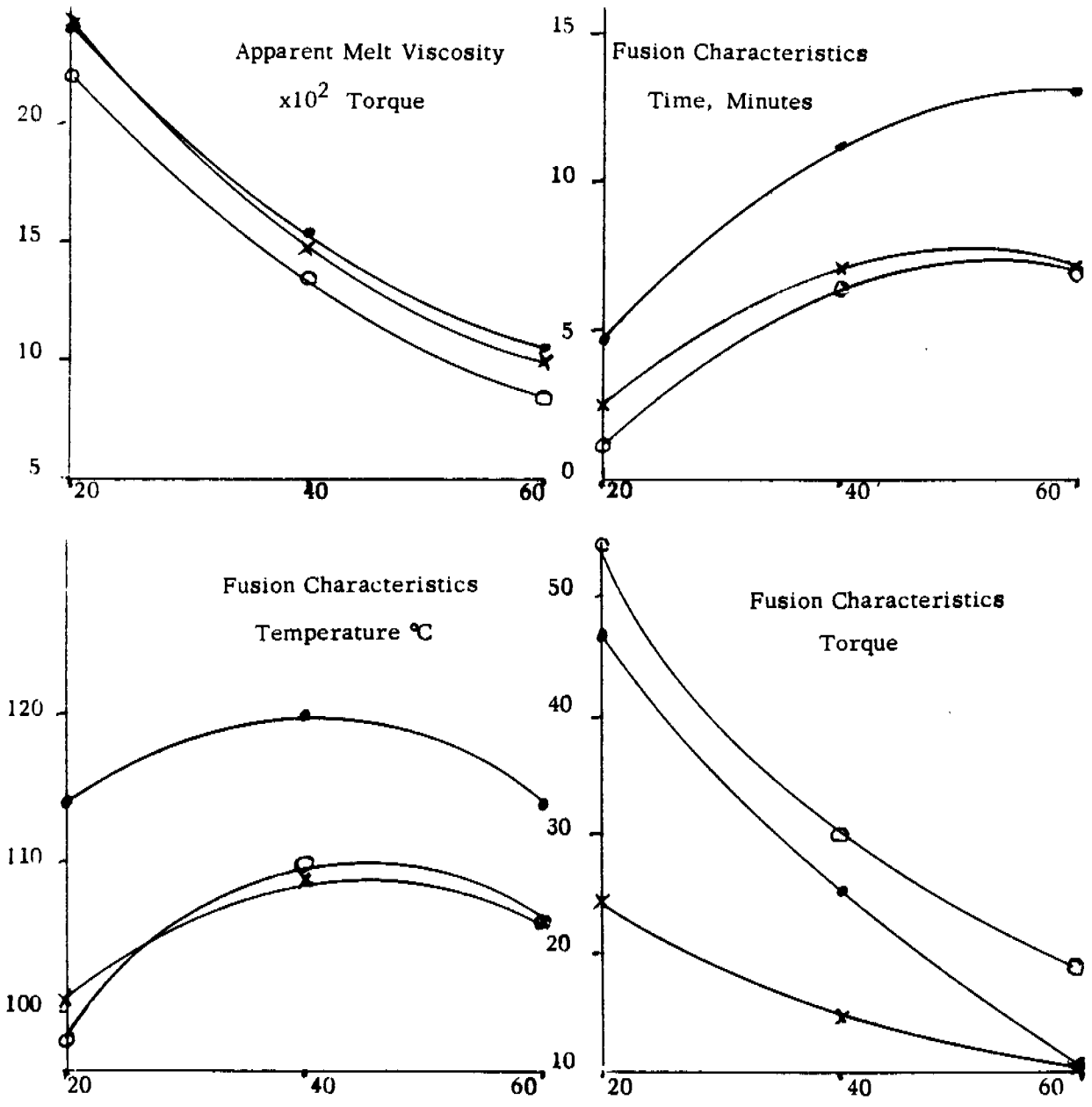
FLEXOL DOP CONCENTRATION PHR

UCC
039489

Figure 2

Vinyl Chloride Resins
Unfilled Compound Physical Properties

• - QYTQ
o - QXOM QEX 1197
x - QSOM Blend 3



FLEXOL DOP CONCENTRATION PHR

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