

EVALUATION
OF
ORGANIC ZINC COATINGS

FINAL REPORT

by

DAVID G. AZAR
Chemical Research Engineer

Research Project No. 69-1Ch(B)
Louisiana HPR 1(7)

Research Report No. 43

Conducted by
LOUISIANA DEPARTMENT OF HIGHWAYS
Research and Development Section
In Cooperation with
U. S. Department of Transportation
Federal Highway Administration
BUREAU OF PUBLIC ROADS

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ABSTRACT

The Louisiana Department of Highways undertook this research project to find a more economical and time saving method for coating a steel bridge. Louisiana is presently using a four coat system of Basic Lead Silico Chromate for steel structures. This evaluation was to study the cost and accelerated life of an Organic Zinc Primer together with its appropriate topcoat versus the cost and life of the presently used Basic Lead Silico Chromate coating.

There were five types of organic zinc rich primers studied:

1. Epoxy Polyamide
2. Phenoxy
3. Non-Catalyzed Epoxys
4. Chlorinated Rubber
5. Modified Epoxys

Each of the aforementioned generic types of Organic Zinc Rich Primers together with its respective topcoat was evaluated and an approved qualified products list for each complete system was made based on the results of accelerated exposures (salt fog and weatherometer tests).

The following conclusions were obtained from the results of this report.

1. Salt Fog and Weatherometer results indicated that for accelerated exposure, Organic Zinc Rich Primers together with its appropriate topcoat performed as well as the Basic Lead Silico Chromate coating system.
2. Organic Zinc Primers together with its appropriate topcoat can be applied for \$0.70/ft.² whereas the Basic Lead Silico Chromate system can be applied for \$0.87/ft.².

Based on the aforementioned life expectancy and cost data, Organic Zinc Primers together with its topcoat appears to be a better coating system in life expectancy versus cost/ft.² than Louisiana Department of Highways Specifications Basic Lead Silico Chromate system.

INTRODUCTION

Louisiana is presently using a coating system that requires four applications of paint. This type of system can be expensive for steel bridges due to the following:

1. Labor for applying four coats of paint.
2. Scaffolding procedures.
3. Loss of time due to drying.

In this research project, an attempt was made to evaluate organic zinc primers together with respective tipcoats (vinyl epoxy, etc.) for use as an alternate to the Basic Lead Silico Chromate system.

This organic zinc system should provide the following advantages:

1. Galvanic zinc protection
2. Less scaffolding procedures
3. Fast drying
4. Resistance to atmospheric contamination.

PURPOSE

The purpose of this study was to evaluate the cost versus life expectancy of organic zinc primers as compared to the conventional Louisiana Department of Highways Specification Basic Lead Silico Chromate paint system using accelerated means of corrosion such as salt-spray exposure and carbon-arc weatherometer exposure.

METHOD OF PROCEDURE

The method of preparation of test panels and procedure for exposure are as follows:

1. Salt-Spray Cabinet - Three steel panels, 4" x 8" x 1/8" were sand blasted to a SSPC-10 near white finish for each system evaluated. The organic zinc primers were applied to a thickness of two to three mils. One set of steel panels were coated with a Basic Lead Silico Chromate paint system for comparative evaluation. The organic zinc coated panels were removed when the Basic Lead Silico Chromate panels began to show undercutting. This device was operated at a salt concentration of 18%, 130°F and a atomizing pressure of 8 psi.
2. Weatherometer Cabinet - Two steel panels, 3" x 6" x 24 gauge, were painted with each topcoat studied. One set of steel panels were coated with Louisiana Department of Highways Specification Basic Lead Silico Chromate paint system for comparative evaluation. This test was to evaluate weathering characteristics of each topcoat. The weatherometer was operated at a relative humidity of 88%, a black panel temperature of 150°F and water pressure of 20 psi. There are 102 minutes of light and 18 minutes of water spray per cycle.
3. Physical Tests - Physical tests of all paints were conducted as well as infra-red spectra on paint vehicles. These tests provided a means of evaluating the topcoats as to chemical resistance.
4. Cost Estimate - A cost estimate of the paint system was determined as follows:
 - a. Cost of sand blasting per square foot of steel surface.
 - b. Cost of scaffolding per square foot of steel surface.
 - c. Cost of paint per coat per square foot of steel surface coated.
 - d. Overall life expectancy of paints based on accelerated corrosion tests. This final estimate was subjective based on percentage of paint life completed during accelerated exposure.

DISCUSSION OF RESULTS

Table 1 of the appendix is a summary of the accelerated test results of all paint systems studied. An examination indicates that one chlorinated rubber organic zinc primer blistered excessively when exposed to salt fog conditions. All phenoxy organic zinc primers blistered excessively through the topcoat during salt fog exposure. This indicated a tight topcoat which did not allow the escape of hydrogen gas bubbles formed from the slow curing phenoxy zinc. The other generic types of organic zinc primers together with topcoats did not show any undercutting and gave good galvanic protection under salt fog conditions.

The Basic Lead Silico Chromate system began to undercut after two weeks salt fog exposure. Since Basic Lead Silico Chromate is the accepted coating for steel bridges, two weeks salt fog exposure has been accepted as the criterion for approving organic zinc primers with topcoats for steel protection only. During this exposure period these must show no signs of undercutting or blistering and fair galvanic protection is required.

Weatherometer Exposure

Weatherometer data, from Table 1, indicated that the aluminum topcoats, regardless of the generic type of the vehicle, performed very well with 500 hours exposure. At the duration of this exposure the aluminum topcoats showed no discoloration or chalking. The grey topcoats, of different generic type vehicle, showed slight deterioration of color after the designated 500 hour exposure period. The grey Basic Lead Silico Chromate topcoat oxidized at approximately the same rate as the grey epoxy and vinyl topcoats. Therefore, it can be said that the topcoats used with the organic zinc rich primers resist ultra-violet light waves as well as the grey Basic Lead Silico Chromate topcoat and it can be surmised that these more sophisticated topcoats will weather as well as the grey Basic Lead Silico Chromate topcoat. A minimum value of 500 hours of Weatherometer exposure has been selected as a criterion for approving topcoats used over organic zinc primers. At the end of this exposure period, for a topcoat to be approved, only slight discoloration and/or slight chalking is acceptable. For any organic zinc system to be approved successful completion of salt fog and weatherometer exposure is necessary.

Cost Versus Life

According to local contractors, the averages cited below are the approximate cost for sandblasting, materials, and scaffolding. The cost estimate for the Basic Lead Silico Chromate, and organic zinc coatings are tabulated as follows:

Basic Lead Silico Chromate (Four-Coat System)

Sandblasting	=	\$. 40/ft. ² (SSPC-6)	=	\$. 40
Scaffolding	=	\$. 07 x 4/ft. ²	=	\$. 27
Material Cost	=	\$. 02 x 4/ft. ²	=	\$. 08
Application Cost	=	\$. 03 x 4/ft. ²	=	\$. 12
				<u>\$. 87/ft. ²</u>

Organic Zinc and Topcoat (Two-Coat System)

Sandblasting	=	\$. 50/ft. ² (SSPC-10)	=	\$. 47
Scaffolding	=	\$. 07 x 1/ft. ²	=	\$. 07
Material Cost	=	\$. 05 x 2/ft. ²	=	\$. 10
Application Cost	=	\$. 03 x 2/ft. ²	=	\$. 06
				<u>\$. 70/ft. ²</u>

According to the aforementioned tabulation organic zinc coatings are cheaper to apply than the four coat system of Basic Lead Silico Chromate

Table 2 of the appendix lists all the physical tests conducted on approved coatings only. The chemical resistance test included immersion of coated panels in 0.1N HCl and 0.1N NaOH solutions. A subjective rating of excellent, good, fair, and poor will be given for each topcoat. The primers were not immersed in the acid and alkali solutions. The other physical tests together with the infra-red spectra were used to write specifications for both construction and maintenance painting, for the organic zinc primers and topcoats.

CONCLUSIONS

The advantages of the two coat system (organic zinc primer with its appropriate topcoat) over Basic Lead Silico Chromate are as follows:

1. Galvanic protection to steel
2. More economical to apply
3. Time saving
4. Good chemical resistance
5. Prevent undercutting
6. Good ultra-violet resistance

RECOMMENDATIONS

The following is a list of coatings that were recommended to the Maintenance Department as an alternate to the Basic Lead Silico Chromate system based on findings of this research project:

1. Amercoat Paint Company, Brea, California
 - a. Amercoat No. 62
 - b. Amercoat No. 72
2. Standard Paint and Varnish Company, New Orleans, Louisiana
 - a. Stapon 3050
 - b. Stapon 3056
3. Admiral Paint Company, Lake Charles, Louisiana
 - a. DM-1144
 - b. CM-1662
4. Enjay Chemical Company, Baton Rouge, Louisiana
 - a. Rust Ban CR 6875
 - b. Rust Ban LD 7198
5. Carboline Paint Company, St. Louis, Missouri
 - a. Carboline No. 655
 - b. Carboline 190HB-W
6. Prufcoat Paint Company, Baton Rouge, Louisiana
 - a. Zinc Prime 100
 - b. Prufcoat No. 545
7. Bywater Sales and Service, New Orleans, Louisiana
 - a. OZR No. 309
 - b. Byco No. 30
8. Southern Imperial Paint Company, New Orleans, Louisiana
 - a. Zinc Primer No. X-50
 - b. Jet Set No. 120
9. Napko Paint Company, Houston, Texas
 - a. Napko - 2Z
 - b. Thixovin No. 5452
10. Mobil Paint Company
 - a. Mobil Zinc No. 4-P-22
 - b. Val Chem No. 89 Series V-6

The results from Table 2, together with Infra-red Spectra on each coating, from the aforementioned list were tabulated and specifications governing these systems are included in the appendix under Table 3. These specifications were submitted to the Bridge Design Section for inclusion in bridge painting contracts as an alternate to Basic Lead Silico Chromate paint.

APPENDIX

TABLE 1
SUMMARY OF ACCELERATED TEST RESULTS

Source	Generic Type	Avg. Mils	Weatherometer Exposure	Salt Fog Exposure
Amercoat Corporated	Modified-non catalyzed-epoxy zinc rich primer. Epoxy polyamide topcoat	3.50 3.00	Slight discoloration & chalking.	No undercutting, good galvanic protection.
Standard Paint & Varnish Co.	Epoxy polyamide zinc primer Catalyzed epoxy topcoat	3.50 3.00	No discoloration, & no chalking.	No undercutting, good galvanic protection.
Napko Paint Co. System (1)	Modified polyhydroyl resin zinc rich primer. Vinyl topcoat	3.75 2.00	No discoloration & slight chalking.	No undercutting, good galvanic protection.
Napko Paint Co. System (2)	Epoxy zinc rich primer Epoxy ester aluminum topcoat	3.75 2.00	No discoloration & no chalking.	No undercutting, good galvanic protection. Excessive blistering.
Carboline Paint Co.	Epoxy polyamide zinc rich primer. Epoxy polyamide topcoat	3.00 3.00	Discoloration & slight chalking.	No undercutting, good galvanic protection.
Admiral Paint Co.	Epoxy polyamide zinc rich primer. Epoxy polyamide topcoat	4.00 2.00	No discoloration & no chalking.	No undercutting, good galvanic protection.
Enjay Chemical Co.	Chlorinated rubber zinc rich primer. Chlorinated rubber topcoat	4.00 2.00	No discoloration & no chalking.	No undercutting, good galvanic protection.
Reliance Universal	Epoxy catalyzed zinc rich primer. Epoxy topcoat	4.50 2.00	Slight discoloration & no chalking.	No undercutting, fair galvanic protection, excessive blistering.

TABLE 1 (CONT'D)

Source	Generic Type	Avg. Mils	Weatherometer Exposure	Salt Fog Exposure
Mobil Paint Co. System (2)	Epoxy polyamide zinc rich primer. Epoxy topcoat	3.50 2.75	Slight discoloration & slight chalking.	No undercutting, good galvanic protection.
Bywater Sales & Service	Epoxy zinc rich primer Modified epoxy topcoat	2.75 3.25	Slight discoloration & no chalking.	No undercutting, good galvanic protection
Bywater Sales & Service	Phenoxy zinc rich primer Epoxy topcoat	3.00 3.00	Slight discoloration & no chalking.	No undercutting, good galvanic protection & excessive blistering.
Southern Imperial Paint Co.	Chlorinated rubber zinc rich primer. Chlorinated rubber topcoat	3.00 3.25	Slight discoloration & no chalking.	Blistered excessively.
Southern Imperial Paint Co.	Modified epoxy zinc rich stain- less steel pigment. Primer and epoxy topcoat	3.25 3.25	Slight discoloration & no chalking.	No undercutting, good galvanic protection.
Prufcoat Paint Co.	Epoxy polyamide zinc rich primer. Vinyl epoxy topcoat	3.00 3.00	Slight discoloration & no chalking.	No undercutting, good galvanic protection.
Mobil Paint Co. System (1)	Phenoxy zinc rich primer Modified epoxy topcoat	3.50 3.00	Slight discoloration & slight chalking.	No undercutting, fair galvanic protection, excessive blistering
Basic Lead Silico Chromate	Linseed Oil alkyd resin	5.00 1.75	Slight discoloration and slight chalking	Undercutting alone scribe in 2 weeks.

TABLE 2
PHYSICAL TEST RESULTS OF ACCEPTED COATINGS

Manufacturer	Solids Content	Volatile Content	Wt. per Gallon	Dry Touch	Recoat Time	Chemical Resistance
Standard Paint Company						
Stapon 3050 zinc primer	79.1%	20.9%	19 lbs.	20 min.	8 hrs.	-
Stapon 3056 epoxy topcoat	54.0%	46.0%	9.5 lbs.	45 min.	-	Good
Amercoat Paint Company						
Amercoat No. 62 zinc primer	78.3%	21.7%	19 lbs.	12 min.	2 hrs.	-
Amercoat No. 72 epoxy topcoat	64.1%	25.9%	12.2 lbs.	1 hr.	-	Good
Admiral Paint Company						
DM-1144 zinc primer	80.1%	19.9%	21 lbs.	30 min.	6 hrs.	-
CM-1662 epoxy topcoat	45.1%	54.9%	9.5 lbs.	30 min.	-	Good
Carboline Paint Company						
No. 655 zinc primer	70.1%	29.9%	17.1 lbs.	30 min.	8 hrs.	-
190HB-W epoxy topcoat	81.0%	19.0%	13 lbs.	45 min.	-	Good
Enjay Chemical Company						
CR-6875 zinc primer	74.3%	25.7%	20 lbs.	15 min.	3 hrs.	-
LD-7198 chlorinated rubber topcoat	55.2%	44.8%	10.3 lbs.	45 min.	-	Good
Napko Paint Company						
2Z zinc primer	75.8%	24.2%	18.5 lbs.	15 min.	5 hrs.	-
Thixovin No, 5452 vinyl topcoat	47.6%	52.4%	9.4 lbs.	30 min.	-	Good
Prufcoat Paint Company						
100 zinc primer	88.0%	22.0%	24 lbs.	15 min.	24 hrs.	-
Series 545 epoxy topcoat	69.9%	30.1%	11.8 lbs.	30 min.	-	Good
Southern Imperial Paint Company						
X-50 zinc primer	56.1%	43.9%	13.4 lbs.	15 min.	24 hrs.	-
Jet Set 120 epoxy topcoat	69.1%	30.9%	12.1 lbs.	1 hr.	-	Good

TABLE 2 (CONT'D)
PHYSICAL TEST RESULTS OF ACCEPTED COATINGS

Manufacturer		Solids Content	Volatile Content	Wt. per Gallon	Dry Touch	Recent Time	Chemical Resistance
Bywater Sales and Service							
	OZR No. 309 zinc primer	73.2%	26.8%	18.6 lbs.	15 min.	24 hrs.	-
	Byco No. 30 epoxy topcoat	72.2%	27.8%	12.0 lbs.	45 min.	-	Good
Mobil Paint Co.							
	Zinc No. 4-P-22	82.0%	18.0%	20.0 lbs.	30 min.	24 hrs.	-
	Val Chem 89 Series V-6	73.0%	27.0%	12.2 lbs.	5 hrs.	-	Good
Basic Lead Silico Chromate							
12	1st Coat	79.0%	21.0%	13.8 lbs.	4 hrs.	24 hrs.	-
	2nd Coat	88.6%	13.4%	15.2 lbs.	5 hrs.	24 hrs.	-
	3rd Coat	87.3%	12.7%	13.9 lbs.	6 hrs.	24 hrs.	-
	Topcoat	67.0%	33.0%	10.1 lbs.	2 hrs.	-	Fair

TABLE 3
Specifications for
All Approved Coatings

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SYSTEM # 1

SPECIFICATIONS
FOR
BASIC LEAD SILICO CHROMATE PAINT

DESCRIPTION: These specifications set forth material requirements for basic lead silico chromate paint to be used in a three or four-coat paint system over properly prepared structural steel surfaces to be permanently exposed. The four-coat paint system will use 1st, 2nd, 3rd and 4th coats of paint and the three-coat system will use only 1st, 3rd and 4th coats of paint as specified herein.

The shop coat (prime coat) for structural steel on new construction shall be in accordance with the requirements of A(1).

The first prime coat for existing steel structures shall be in accordance with the requirements of A(2), unless otherwise specified.

The final field coat (4th coat) shall meet the requirements of either "D(1)-Bright Green Paint" or "D(2)-Cement Gray Paint," as specified.

REQUIREMENTS:

A(1). 1st Coat Basic Lead Silico Chromate Brown Paint (Shop prime coat or first prime coat for steel on new construction).

(a) Pigment. The pigment shall be well ground and be composed of:

	<u>Min. %</u>	<u>Max. %</u>
Basic Lead Silico Chromate (ASTM Designation: D 1648)	93.2	- - -
Siliceous Red Iron Oxide (85% Fe ₂ O ₃)	5.0	6.1
Organo Montmorillonite	0.5	0.7

(b) Liquid. The liquid shall consist of not less than 52% nonvolatile vehicle, the balance to be combined drier and thinner. The nonvolatile vehicle shall be composed of raw linseed oil and alkyd resin combined in the approximate proportions of 1:1 respectively by weight and shall contain a minimum of 7.0% phthalic anhydride. The alkyd resin, furnished as a solution, shall meet the requirements of Federal Specification TT-R-266, Type III. Small quantities of grinding and wetting aids may be used if desired.

(c) The paint shall consist of:

	<u>Min.</u>	<u>Max.</u>
Pigment	57.0%	- - -
Vehicle	- - -	43.0%
Weight/Gallon, Pounds @ 77°F	13.5	- - -
Water	- - -	0.5%
Coarse Particle and Skins (Total Residue Retained on 325 Sieve Based on Paint)	- - -	1.0%
Fineness of Grind (North Standard)	4	- - -
Viscosity (Stormer - Krebs Units) @ 77°F	72	83
Drying Time:		
Set to Touch, hours	- - -	4
Dry Through, hours	- - -	16

The material which follows is a suggested batching formulation that will meet the requirements of the prior stated composition.

% By Weight

PIGMENT - 58.4% by Weight	
Basic Lead Silico Chromate	
(ASTM Designation: D 1648)	93.5
Siliceous Red Iron Oxide (85% Fe ₂ O ₃)	5.9
*Organo Montmorillonite	0.6
	<u>100.0</u>

*Prewet with 30% by weight of methyl alcohol:water -
(95:5) before adding to grind.

VEHICLE - 41.6% by Weight	
Raw Linseed Oil (AASHO Designation: M 125-60)	26.7
Alkyd Resin (TT-R-266, Type III)	52.3
Mineral Spirits	18.7
5% Zirconium Catalyst	1.2
6% Manganese Naphthenate	0.4
6% Cobalt Naphthenate	0.2
Anti-Skinning Agent	0.2
Methyl Alcohol:Water (95:5)	0.3
	<u>100.0</u>

P V (% pigment by volume in nonvolatile portion of
paint): 39.7

Volatile and drier in vehicle: 44.9%

A(2). 1st Coat Basic Lead Silico Chromate Brown Paint (First prime coat for existing steel structures and maintenance painting).

(a) Pigment. The pigment shall be well ground and be composed of:

	<u>Min. %</u>	<u>Max. %</u>
Basic Lead Silico Chromate		
(ASTM Designation: D 1648)	94.0	- - -
Siliceous Red Iron Oxide (85% Fe ₂ O ₃)	4.0	5.5
Organo Montmorillonite	0.5	0.7

(b) Liquid. The liquid shall consist of not less than 69% nonvolatile vehicle, the balance to be combined drier and thinner. The nonvolatile vehicle shall be composed of raw linseed oil and alkyd resin combined in the approximate proportions of 2.3:1 respectively by weight and shall contain a minimum of 7.0% phthalic anhydride. The alkyd resin, furnished as a solution, shall meet the

requirements of Federal Specification TT-R-266, Type 1, Class A or B. A drier combination of 0.14% zirconium, 0.04% Manganese, and 0.02% Cobalt metals furnished in soluble form based on the nonvolatile vehicle of the paint, shall be used. Small quantities of grinding and wetting aids may be used if desired.

(c) The paint shall consist of:

	<u>Min.</u>	<u>Max.</u>
Pigment	64.0%	- - -
Vehicle	- - -	36.0%
Weight/Gallon, Pounds @ 77°F	15.0	- - -
Water	- - -	0.5%
Coarse Particle and Skins (Total Residue Retained on 325 Sieve Based on Paint)	- - -	1.0%
Fineness of Grind (North Standard)	4	- - -
Viscosity (Stormer - Krebs Units) @ 77°F	72	80
Dry Firm, Hours	18	- - -

The material which follows is a suggested batching formulation that will meet the requirements of the prior stated composition.

% By Weight

PIGMENT - 64.58% by Weight	
Basic Lead Silico Chromate	
(ASTM Designation: D 1648)	94.43
Siliceous Red Iron Oxide (85% Fe ₂ O ₃)	4.97
*Organo Montmorillonite	0.60
	<u>100.00</u>

*Prewet with 30% by weight of methyl alcohol:water - (95:5) before adding to grind.

VEHICLE - 35.42% by Weight	
Raw Linseed Oil (AASHO Designation: M 125-60)	48.46
Alkyd Resin (TT-R-266, Type 1, Class A)	30.81
Mineral Spirits	17.94
6% Zirconium Catalyst	1.58
6% Manganese Naphthenate	0.47
6% Cobalt Naphthenate	0.24
Anti-Skinning Agent	0.18
Methyl Alcohol:Water (95:5)	0.32
	<u>100.00</u>

P V (% pigment by volume in nonvolatile portion of paint): 38.1

Volatile and drier in vehicle: 29.9%

B. 2nd Coat Basic Lead Silico Chromate Maroon Paint.

(a) Pigment. The pigment shall be well ground and be composed of:

	<u>Min. %</u>	<u>Max. %</u>
Basic Lead Silico Chromate (ASTM Designation: D 1648)	64.0	- - -
Siliceous Red Iron Oxide (85% Fe ₂ O ₃)	- - -	35.5
*Organo Montmorillonite	0.5	0.7

(b) Liquid. The liquid shall consist of not less than 72% nonvolatile vehicle, the balance to be combined drier and thinner. The nonvolatile vehicle shall be composed of raw linseed oil and alkyd resin combined in the approximate proportions of 2:1 respectively by weight and shall contain a minimum of 7.6% phthalic anhydride. The alkyd resin, furnished as a solution, shall meet the requirements of Federal Specification TT-R-266, Type 1, Class A or B. A drier combination of 0.14% Zirconium and 0.04% Manganese metals furnished in soluble form based on the nonvolatile vehicle of the paint, shall be used. Small quantities of grinding and wetting aids may be used if desired.

(c) The Paint shall consist of:

	<u>Min.</u>	<u>Max.</u>
Pigment	62.0%	- - -
Vehicle	- - -	38.0%
Weight/Gallon, pounds at 77°F	14.8	- - -
Water	- - -	0.5%
Coarse Particles and Skins (total residue retained on 325 sieve based on paint)	- - -	1.0%
Fineness of Grind (North Standard)	4	- - -
Viscosity (Stormer - Krebs Units) at 77°F	74	84
Dry Firm, hours	18	- - -

The material which follows is a suggested batching formulation that will meet the requirements of the prior stated composition.

	<u>% By Weight</u>
PIGMENT - 62.26% by Weight	
Basic Lead Silico Chromate (ASTM - D 1648)	64.42
Siliceous Red Iron Oxide (85% Fe ₂ O ₃)	34.79
*Organo Montmorillonite	0.59
	<u>100.00</u>

*Prewet with 30% by weight of methyl alcohol:water -
(95:5) before adding to grind.

% By Weight

VEHICLE - 37.74% by Weight

Raw Linseed Oil (AASHO M 125-60)	47.56
Alkyd Resin (TT-R-266, Type 1, Class A)	34.44
Mineral Spirits (Hv)	14.76
Anti-Skinning Agent	0.16
6% Zirconium Catalyst	1.80
6% Manganese Naphthenate	0.49
Methyl Alcohol:Water (95:5)	0.30
Soya Lecithin	0.49
	<u>100.00</u>

PV (% pigment by volume in nonvolatile portion of paint): 34.8

Volatile and drier in Vehicle: 27.84%

C. 3rd Coat Basic Lead Silico Chromate Grey Paint

(a) Pigment. the pigment shall be well ground and be composed of:

	<u>Min. %</u>	<u>Max. %</u>
Basic Lead Silico Chromate (ASTM - D 1648)	65.6	- - -
Chalk Resistant Rutile Titanium Dioxide	- - -	16.6
Acicular Zinc Oxide	- - -	5.8
Fibrous Magnesium Silicate and Tinting colors (Lampblack and Phthalocyanine Blue)		
No Iron Blue permitted	- - -	11.5
Organo Montmorillonite	0.5	- - -

(b) Liquid. The liquid shall consist of not less than 69% nonvolatile vehicle, the balance to be combined drier and thinner. The nonvolatile vehicle shall be composed of raw linseed oil and alkyd resin combined in the approximate proportions of 2:1 respectively by weight and shall contain a minimum of 7.5% phthalic anhydride. The alkyd resin, furnished as a solution, shall meet the requirements of Federal Specification TT-R-266, Type 1, Class A or B. Small quantities of grinding and wetting aids may be used if desired.

(c) The paint shall consist of:

	<u>Min.</u>	<u>Max.</u>
Pigment	56.5%	- - -
Vehicle	- - -	43.5%
Weight/Gallon, pounds @ 77°F	13.5	- - -
Water	- - -	0.5%
Coarse Particles and Skins (total residue retained on 325 sieve based on paint)	- - -	1.0%
Fineness of Grind (North Standard)	4	- - -
Viscosity (Stormer - Krebs Units) @ 77°F	72	82
Dry Firm, hours	18	- - -

The material which follows is a suggested batching formulation that will meet the requirements of the prior stated composition.

	<u>% By Weight</u>
PIGMENT - 57.7% by Weight	
Basic Lead Silico Chromate (ASTM - D 1648)	67.80
Titanox RANC	15.52
Zinc Oxide	5.13
Magnesium Silicate	9.77
Lampblack	0.81
Phthalocyanine Blue	0.36
*Organo Montmorillonite	<u>0.61</u>
	100.00

*Prewet with 30% by weight of methyl alcohol:water - (95:5) before adding to grind.

VEHICLE - 42.3% by Weight	
Raw Linseed Oil (AASHO M 125-60)	46.83
Alkyd Resin (TT-R-266, Type 1, Class A)	33.33
Mineral Spirits	18.00
6% Zirconium Catalyst	1.17
6% Manganese Naphthenate	0.23
Anti-Skinning Agent	0.16
Methyl Alcohol:Water (95:5)	<u>0.28</u>
	100.00

PV (% pigment by volume in nonvolatile portion of paint): 32.5

Volatile and drier in vehicle: 30%

D(1). 4th Coat Basic Lead Silico Chromate (Bright Green Paint).

(a) Pigment. The pigment shall be well ground and be composed of:

	<u>Min. %</u>	<u>Max. %</u>
Basic Lead Silico Chromate (ASTM - D 1648)	64	- - -
Titanium Dioxide, Rutile Nonchalking	18	- - -
Tinting colors (C.P. Chrome Yellow Light Phthalocyanine Green)	B a l a n c e	
Organo Montmorillonite	0.8	1.0

(b) Liquid. The liquid shall consist of not less than 47.0% nonvolatile vehicle, the balance to be combined drier and thinner. The nonvolatile vehicle shall be an alkyd resin conforming to Federal Specification TT-R-266, Type 1, Class A or B. The thinner shall be essentially mineral spirits meeting Federal Specification TT-T-291a, Grade 1. Small quantities of grind and wetting aids may be used if desired.

(c) The paint shall consist of:

	<u>Min.</u>	<u>Max.</u>
Pigment	30.5%	- - -
Vehicle	- - -	69.5%
Weight/Gallon, pounds	9.8	- - -
Water	- - -	0.5%
Coarse Particles and Skins (total residue retained on 325 sieve based on paint)	- - -	1.0%
Fineness of Grind (North Standard)	5	- - -
Viscosity (Stormer - Krebs Units)	65	75
Dry Firm, hours	- - -	8

The material which follows is a suggested batching formulation that will meet the requirements of the prior stated composition.

	<u>% By Weight</u>
PIGMENT - 31.0% by Weight	
Basic Lead Silico Chromate (ASTM - D 1648)	64.2
Titanox RANC	18.4
Chrome Yellow, Light	11.0
Phthalocyanine Green	5.5
*Organo Montmorillonite	0.9
	<u>100.0</u>

*Prewet with 30% by weight of methyl alcohol:water - (95:5) before adding to grind.

	<u>% By Weight</u>
VEHICLE - 69.0% by Weight	
Alkyd Resin (TT-R-266, Type 1, Class A)	67.2
Mineral Spirits	30.7
Zirconium Catalyst, 6%	1.2
Cobalt Naphthenate, 6%	0.3
Manganese Naphthenate, 6%	0.3
Anti-Skinning Agent	0.2
Methyl Alcohol:Water (95:5)	0.1
	<u>100.0</u>

PV (% pigment by volume in nonvolatile portion of paint): 20.1

Volatile and drier in vehicle: 53.0%

D(2). 4th Coat Basic Lead Silico Chromate (Cement Gray Paint).

(a) Pigment. The pigment shall be composed of:

	<u>Min. %</u>	<u>Max. %</u>
Basic Lead Silico Chromate (ASTM - D 1648)	39.0	- - -
Titanium Dioxide, Rutile Non-Chalking	57.0	- - -
Phthalocyanine Blue and Lampblack	B a l a n c e	
Organo Montmorillonite	0.7	0.9

(b) Liquid. The liquid shall consist of not less than 50% nonvolatile vehicle, the balance to be combined drier and thinner. The nonvolatile vehicle shall be an alkyd resin conforming to Federal Specification TT-R-266, Type 1, Class A or B. The thinner shall be essentially mineral spirits meeting Federal Specification TT-T291a, Grade 1. Small quantities of grind and wetting aids may be used if desired.

(c) The paint shall consist of:

	<u>Min.</u>	<u>Max.</u>
Pigment	33.0%	- - -
Vehicle	- - -	67.0%
Weight/Gallon, pounds @ 77°F	10.0	- - -
Water	- - -	0.5%
Coarse Particles and Skins (Total residue retained on 325 sieve based on paint)	- - -	1.0%
Fitness of Grind (North Standard)	5	- - -
Viscosity (Stormer - Krebs Units) @ 77°F	68	75
Dry Film, hours	- - -	8

The material which follows is a suggested batching formulation that will meet the requirements of the prior stated composition.

	<u>% By Weight</u>
PIGMENT - 33.6% by Weight	
Basic Lead Silico Chromate (ASTM - D 1648)	39.10
Titanox RANC	58.66
*Organo Montmorillonite	0.84
Phthalocyanine Blue	1.40
	<u>100.00</u>

*Prewet with methyl alcohol, 30% by weight: water - (95:5) before adding to grind.

% By Weight

VEHICLE - 66.4% by Weight

Alkyd Resin (TT-R-266, Type 1, Class A)	72.8
Mineral Spirits AASHO M 128-60	24.9
6% Zirconium Catalyst	1.4
6% Cobalt Naphthenate	0.3
6% Manganese Naphthenate	0.3
Anti-Skinning Agent	0.2
Methyl Alcohol:Water (95:5)	1.0
	<u>100.0</u>

Conforms to: Federal Standard
No. 595-16314

PV (% Pigment by volume in nonvolatile portion of paint): 20.8

Volatile and Drier in Vehicle: 49.1%

E. APPLICATION: Coating must be capable of being applied to the required film thickness by brush, roller or spray application methods without difficulty at temperatures above 40 degrees F. and shall exhibit no running, streaking, sagging, wrinkling, or other film defects.

F. COLOR: The color shall be as specified in the purchase requisition for the paint of a particular coat. Color chips are available upon request from the Department's Central Testing Laboratory.

G. HIDING POWER: Shall be sufficient to obtain complete hiding when applied at normal spreading rates.

H. PACKAGING AND STORAGE: The material shall be shipped in five (5) gallon, full lid, metal containers meeting the latest requirements of the Interstate Commerce Commission for shipping containers for materials, unless other size containers are specified. The containers shall have appropriate descriptive labels with necessary instructional information.

The material as supplied and after one year storage shall show no skinning or settling, color change, nor thickening or livering that cannot be readily brought to stable consistency by normal mixing procedures.

SYSTEM # 2

SPECIFICATIONS

Standard Paint & Varnish Company
3300 River Road
P.O. Box 826
Harvey, Louisiana 70058

A - ORGANIC ZINC PRIMER (STAPON #3050)

1. Generic Type - Epoxy - Polyamide
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 76.0
 - b. Volatile content, %, maximum 24.0
 - c. Wt./gallons, pounds, minimum 17.0
 - d. Pot life @ 70°F, hours, minimum 8.0
 - e. Recoat time, hours, minimum 8.0
 - f. Dry to touch, minutes, maximum 45.0
 - g. Infra-red Spectra (zinc paint vehicle) Pass
 - h. Infra-red Spectra (curing agent, zinc paint) Pass

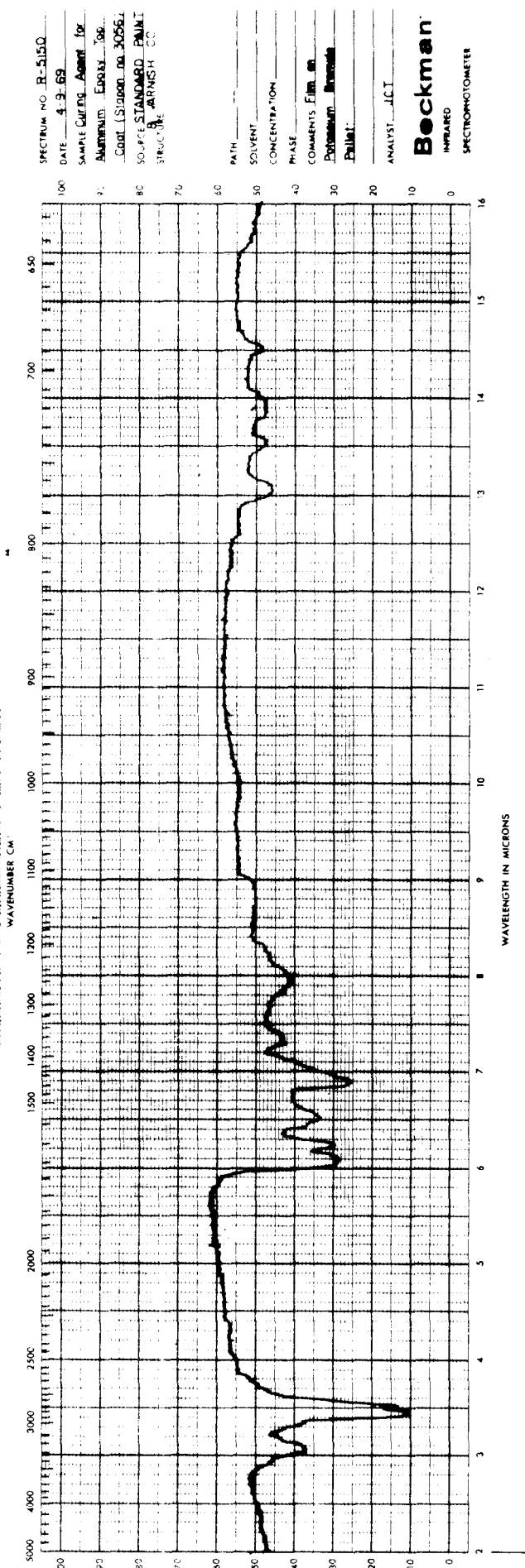
B - ALUMINUM EPOXY TOPCOAT (STAPON #3056)

1. Generic Type - Catalyzed - Epoxy
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 46.0
 - b. Volatile content, %, maximum 54.0
 - c. Wt./gallons, pounds, minimum 8.5 - 10.5
 - d. Pot life @ 70°F, hours, minimum 8
 - e. Dry touch, hours, maximum 1
 - f. Infra-red Spectra (Aluminum paint vehicle) Pass
 - g. Infra-red Spectra (curing agent aluminum paint) Pass

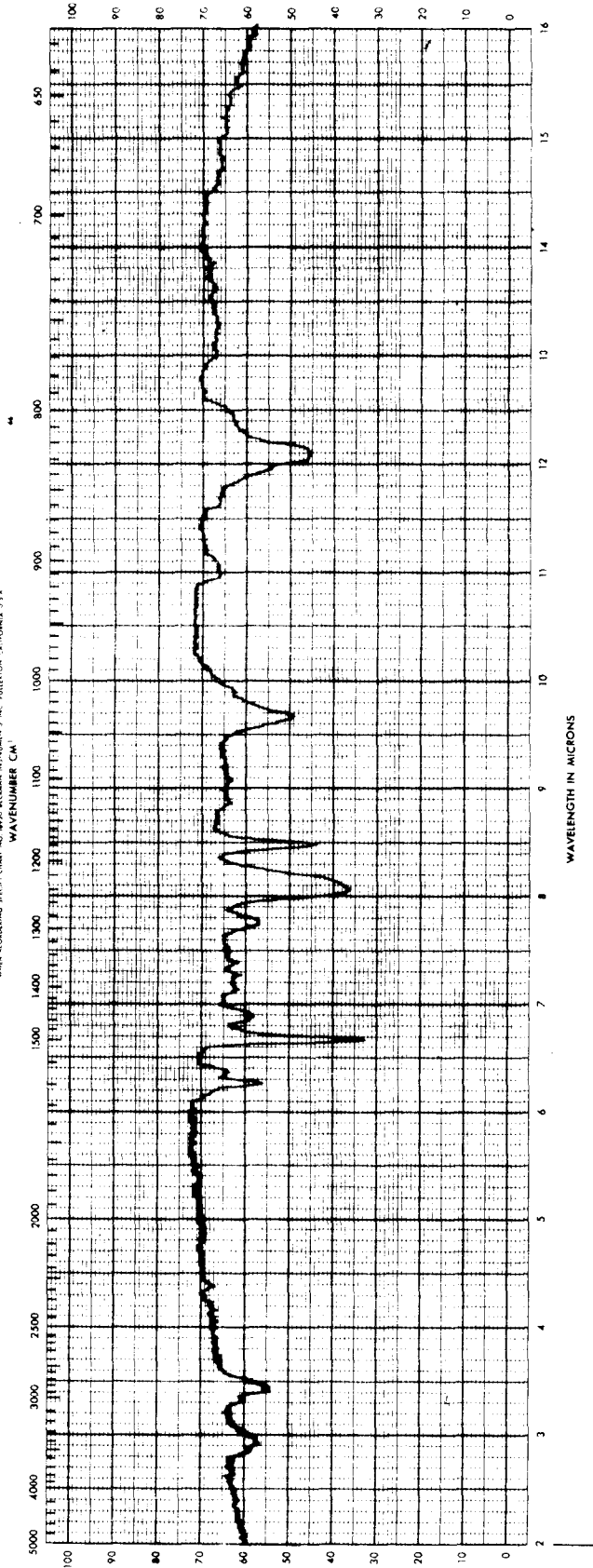
C - THINNER (T-3810 & T-3806)

WATER RECORDING SPECTRA CHART NO. 1025 BECKMAN INSTRUMENTS INC. FULLERTON, CALIFORNIA, U.S.A.

PRINTED IN U.S.A.

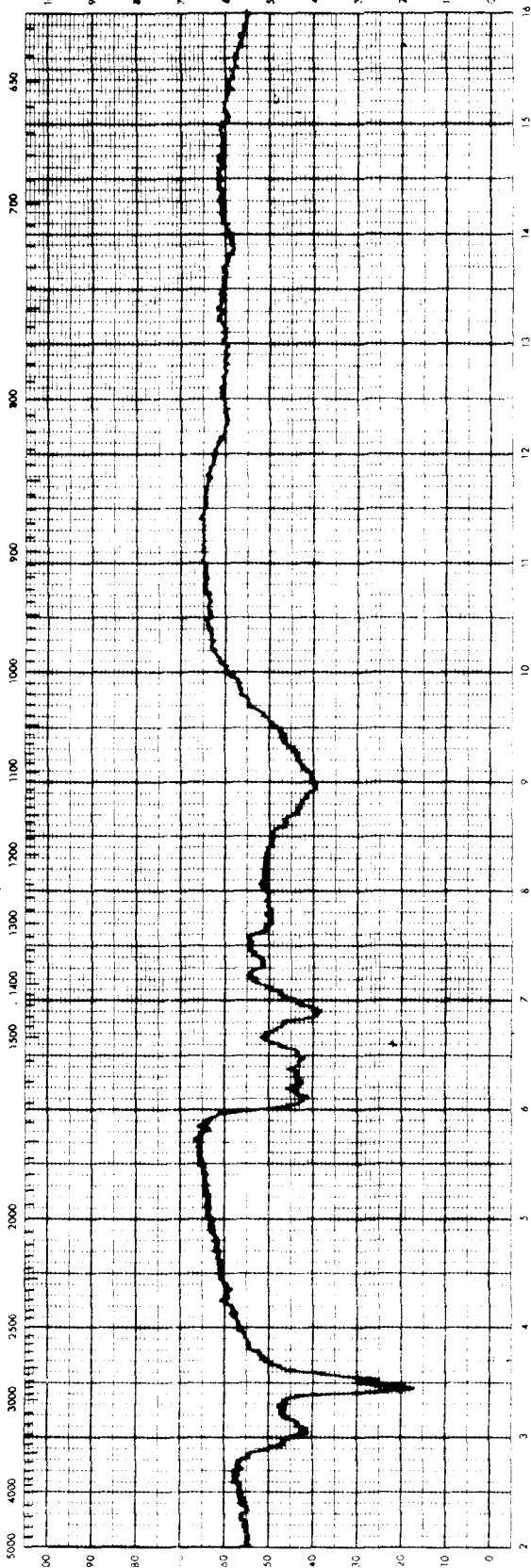


SPECTRUM NO. R-5150
DATE 4-9-69
SAMPLE Curing Agent for
AMPHENIM Epoxy 196
COOL LS10000 NO. 30561
SOURCE STANDARD PAINT
STRUCTURE FINISH CO
PATH _____
SOLVENT _____
CONCENTRATION _____
PHASE _____
COMMENTS Film on
Potassium Bromide
Pallet: _____
ANALYST JCT
Beckman
IMPALED
SPECTROPHOTOMETER



SPECTRUM NO. R-5151
 DATE 4-9-69
 SAMPLE Aluminum Epoxy
 Top Coat (Stippen no. 3056)
 Vehicle
 SOURCE STANDARD PAINT
 STRUCTURE B VARNISH CC
 PATH
 SOLVENT
 CONCENTRATION
 PHASE
 COMMENTS Film on
 Potassium Bromide
 Pellet
 ANALYST J.C.T.
Beckman
 INFRARED
 SPECTROPHOTOMETER

WAVENUMBER CM⁻¹



SPECTRUM NO. R-5152
DATE 4-9-69
SAMPLE Carbox Asphalt for
Organic Zinc Primer
Union, Inc. 30501
SOURCE STANDARD PAINT
& VARNISH CO
STRUCTURE

PATH _____
SOLVENT _____
CONCENTRATION _____
PHASE _____
COMMENTS ELIM. OIL
POLYMER IN COMPOUND
PURITY _____
ANALYST J.C.I.

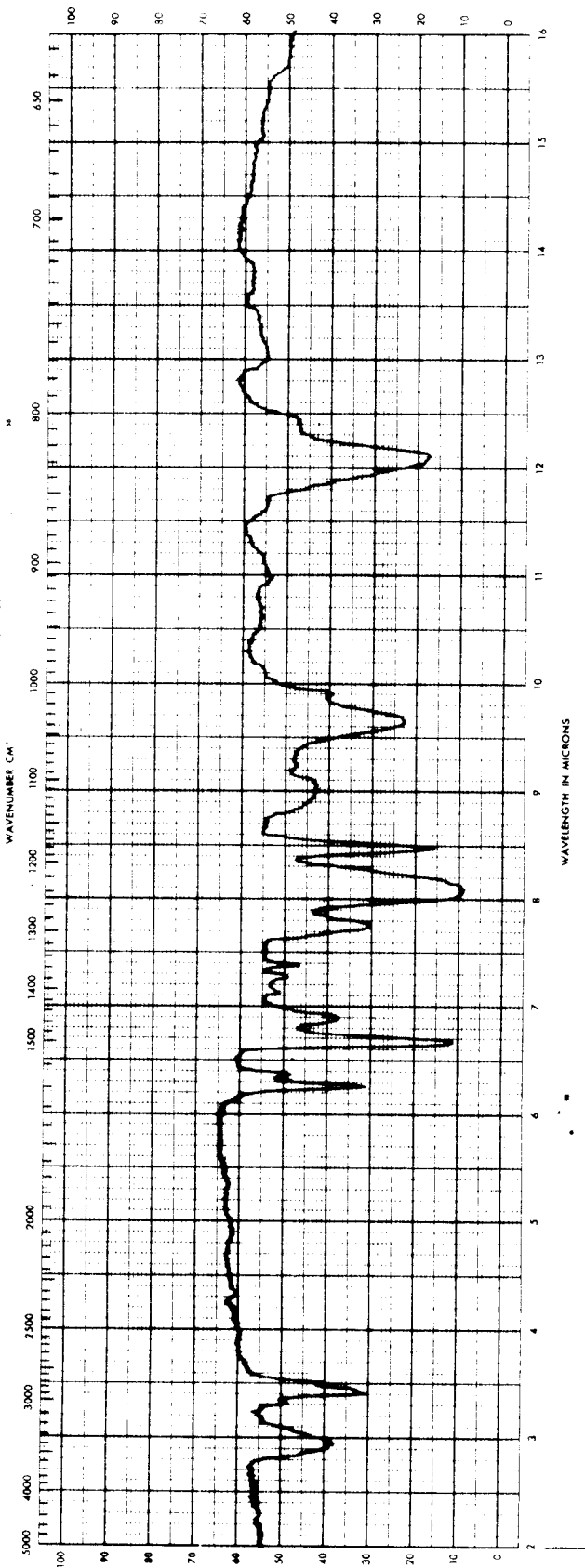
Beckman
INFRARED
SPECTROMETER

SPECTRUM NO. R-5153
 DATE 4-9-69
 SAMPLE Organic Zinc
 Prime Specimen No. 30501
 Vehicle
 SOLVENT STANDARD PAINT
 STRUCTURE VARNISH CO
 PATH
 SOLVENT
 CONCENTRATION
 PHASE
 COMMENTS Film on
 Potassium Bromide
 Pellet
 ANALYST J.C.T.

Beckman

INFRARED
 SPECTROMETER

System #2
 Page 5 of 5 pages



SYSTEM # 3

SPECIFICATIONS

Amercoat Corporation
 201 North Berry Street
 Brea, California

A - ORGANIC ZINC PRIMER (AMERCOAT #62)

1. Generic Type - Modified Non-Catalyzed Epoxy Zinc Rich Primer
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 70.0
 - b. Volatile content, %, maximum 30.0
 - c. Wt./gallons, pounds, minimum 17.0
 - d. Pot life @ 70°F, minimum 1 week
 - e. Recoat time, hours, minimum 3
 - f. Dry touch, minutes, maximum 30
 - g. Infra-red Spectra Pass

B - GREY EPOXY TOPCOAT (AMERCOAT #72)

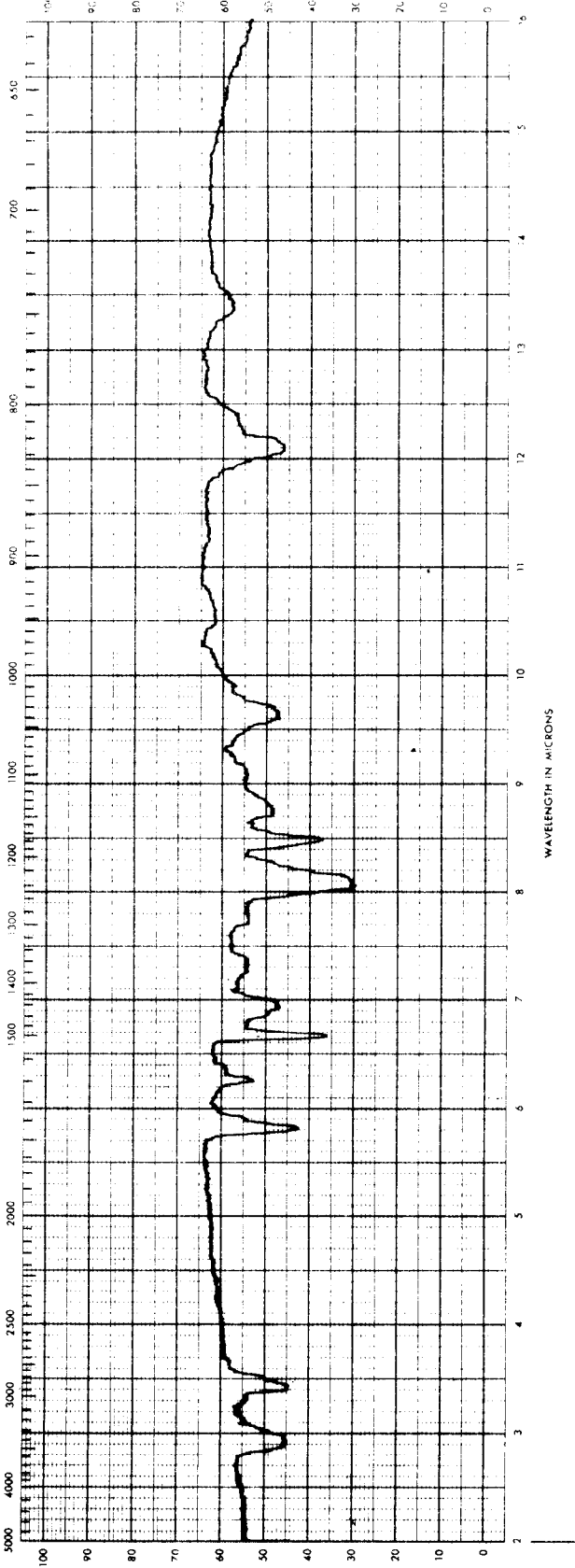
1. Generic Type - Epoxy - Polyamide
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 60.0
 - b. Volatile content, %, maximum 40.0
 - c. Wt./gallons, pounds 9.0 - 11.0
 - d. Pot life @ 70°F, hours, minimum 8
 - e. Dry touch, hours, maximum 2
 - f. Infra-red Spectra (Comp B) Pass
 - g. Infra-red Spectra (Comp A) Pass

C - THINNERS (AMERCOAT #9 & AMERCOAT #6)

1. Amercoat #9 - Physical Properties
 - a. Infra-red Spectra Pass
2. Amercoat #6 - Physical Properties
 - a. Infra-red Spectra Pass

WAVENUMBER CM

45



SPECTRUM NO. R-4982
 DATE 4-9-69
 SAMPLE Organic Zinc
 Printer Amercoat no 62
 Vehicle
 SOURCE AMERCOAT CORE
 STRUCTURE
 PATH
 SOLVENT
 CONCENTRATION
 PHASE
 COMMENTS Film on
 Apogee Bromide
 Pellet
 ANALYST J G T
 INFRARED
 SPECTROPHOTOMETER

Beckman

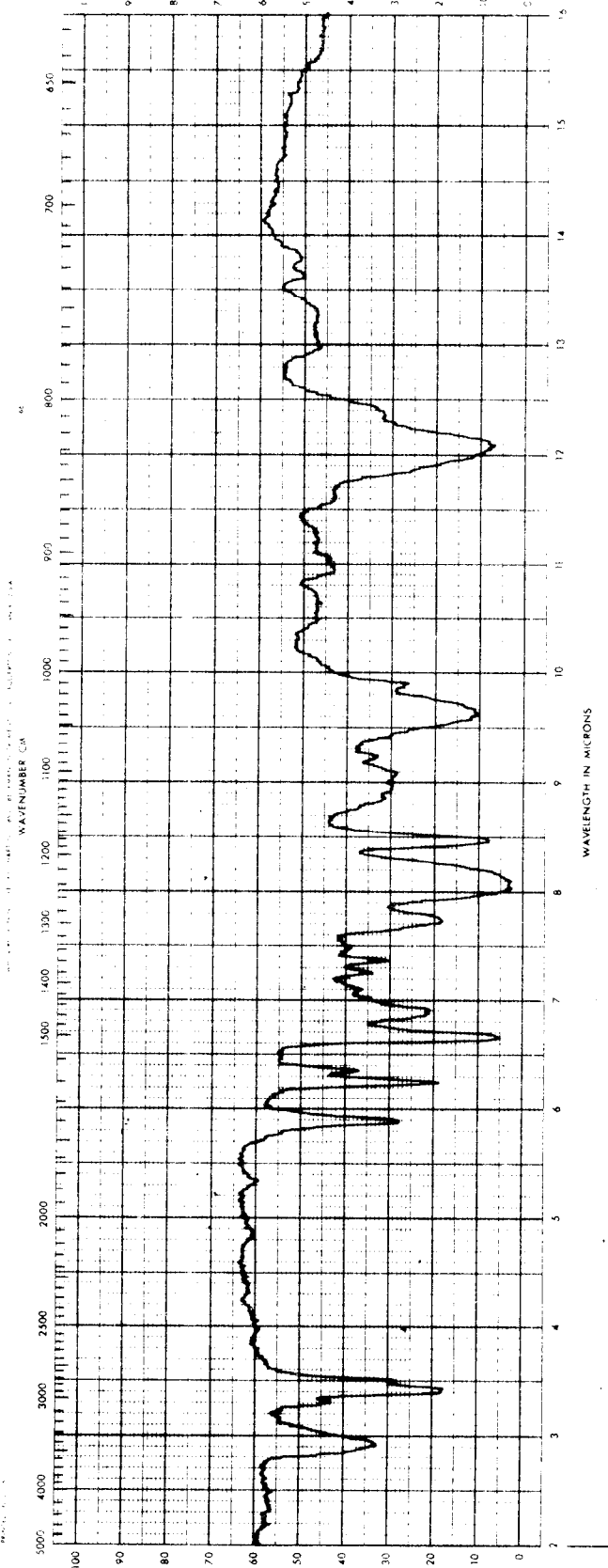
SPECTRUM NO. R-4985
 DATE 4-9-69
 SAMPLE Gray Epoxy
 Top Coat (same coat as 72)
 Vehicle
 SOURCE AMB BCOAT CORP
 STRUCTURE

PATH
 SOLVENT
 CONCENTRATION
 PHASE
 COMMENTS Film on
 Potassium Bromide
 Pellet
 ANALYST J.C.T.

Beckman

INTEGRATED
 SPECTROPHOTOMETER

System #3
 Page 3 of 6 pages



SPECTRUM NO R-4984DATE 4-9-69

SAMPLE Actuator for

Grey Epoxy Top Coat

Americast no. 72)

SOURCE AMERICOAT CORP.

S'P'Q, C'P'Q?

PATH _____

SOLVENT.....

CONCENTRA

PHASE . . .

COMMENTS

Potassium

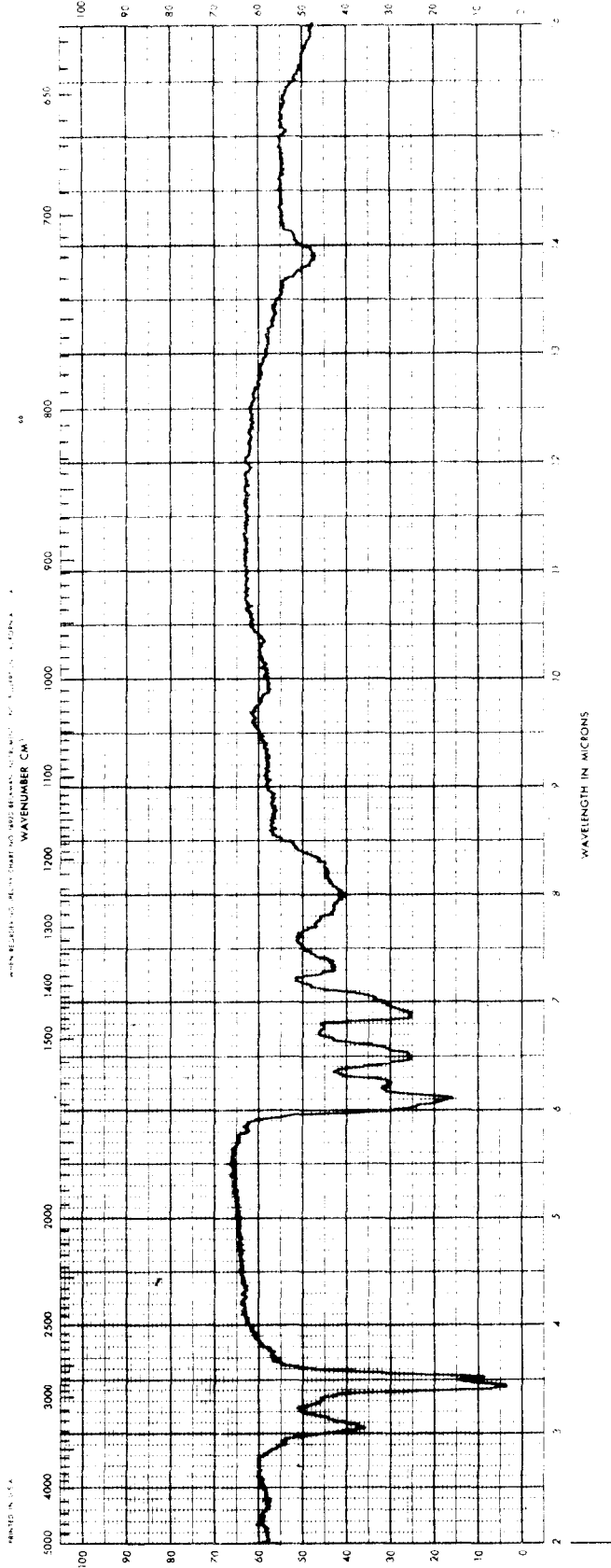
Patient ..

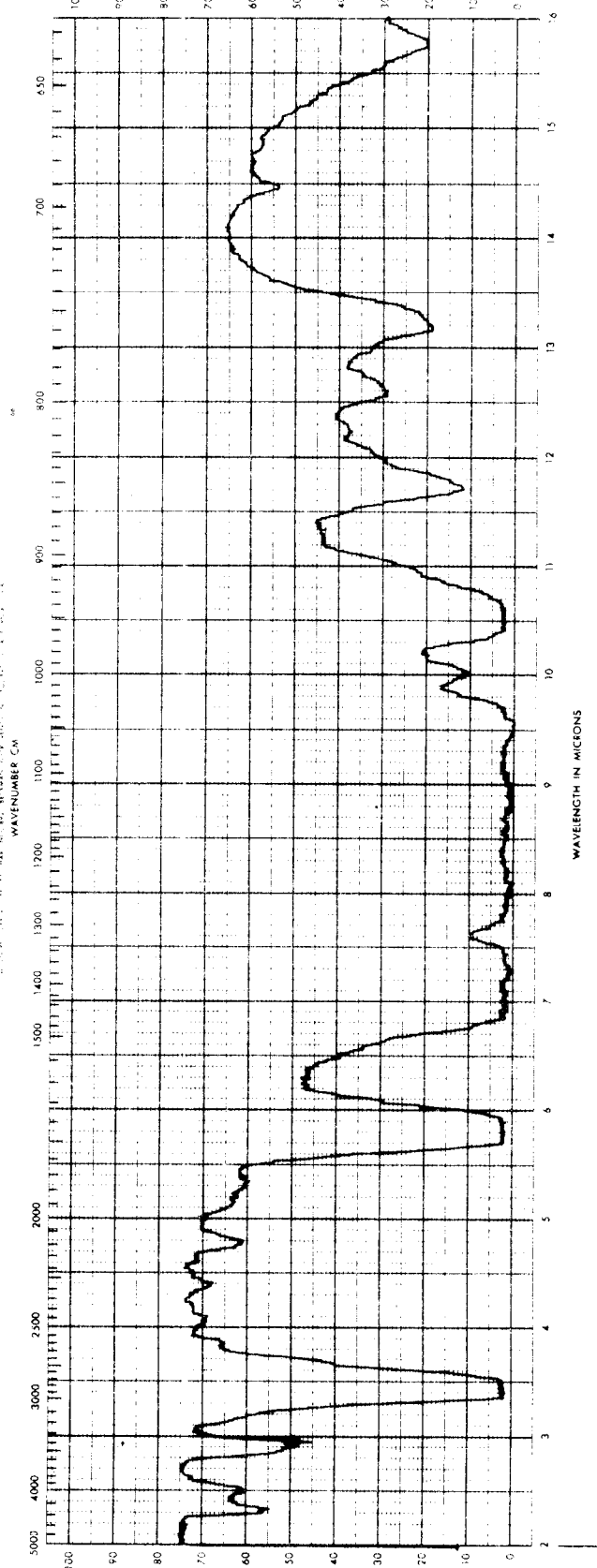
Keywords: child sexual abuse; disclosure; social support

Beckman

INFRARED:

2025.03.25





SPECTRUM NO. R-4986

DATE 4-9-69

SAMPLE Pent Thiol

Label no. 21

SOURCE AMERCOAT COFFE

TEMPERATURE

PAIR

SOLVENT

CONCENTRATION

PHASE

COMMENTS: Between

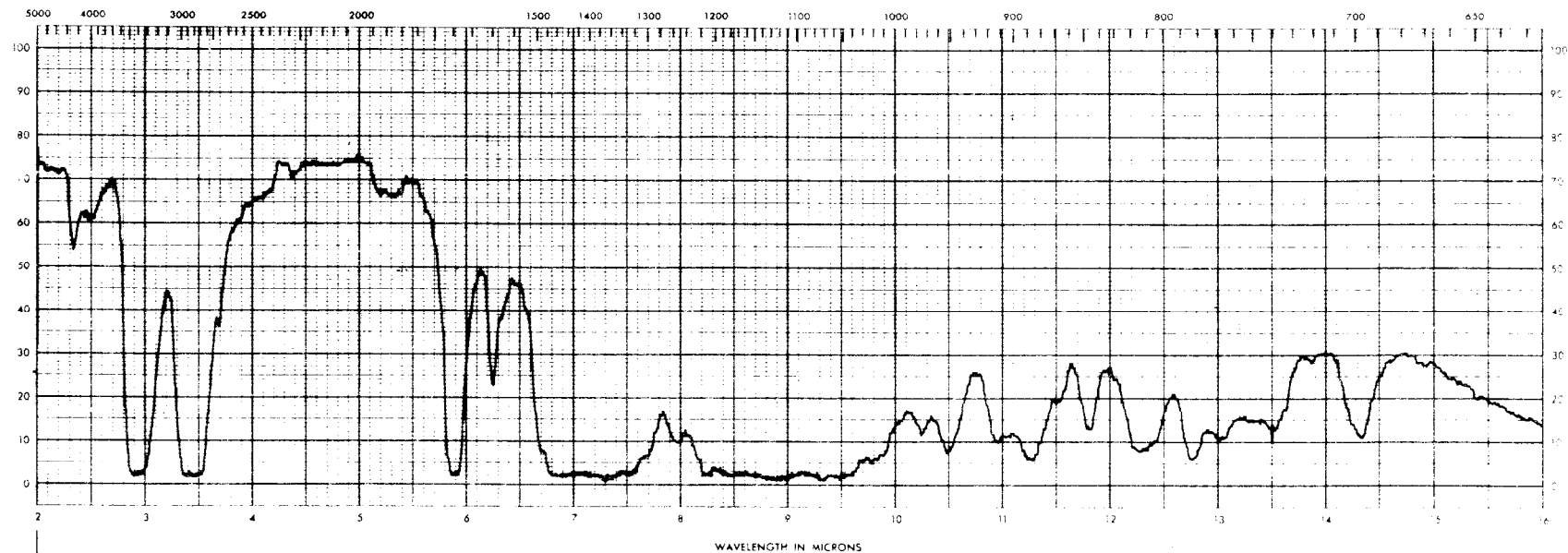
Sodium Chloride Window's

ANALYST JCI

Beckman

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SPECTROPHOTOMETER



SPECTRUM NO. R-4987...

DATE 4-9-69

SAMPLE Paint Thinner

LAmerscoat. no. 61

SOURCE AMERCOAT. CORP.

STRUCTURE

PATH

SOLVENT

CONCENTRATION

PHASE

COMMENT Between

Sodium Chloride Windows

ANALYST J.C.T.

Beckman

NIRAPED

SPECTROPHOTOMETER

SYSTEM # 4

SPECIFICATIONS

Admiral Paint Company
124 Ryan Street
Lake Charles, Louisiana 70601

A - ORGANIC ZINC PRIMER (DM-1144)

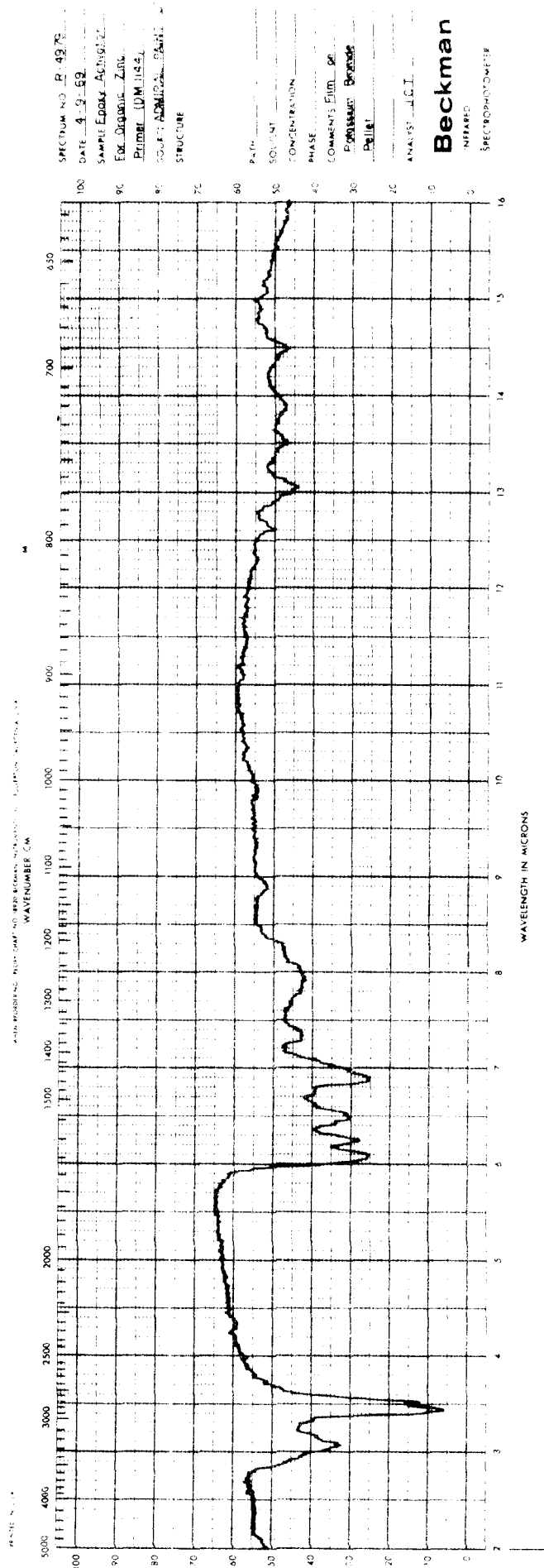
1. Generic Type - Epoxy -Polyamide
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 80.0
 - b. Volatile content, %, maximum 20.0
 - c. Wt./gallon, pounds, minimum 21.0
 - d. Pot life @ 70°F, hours, minimum 12
 - e. Recent time, hours, minimum 6
 - f. Dry touch, minutes, maximum 45
 - g. Infra-red Spectra (vehicle for zinc) Pass
 - h. Infra-red Spectra (activator for zinc) Pass

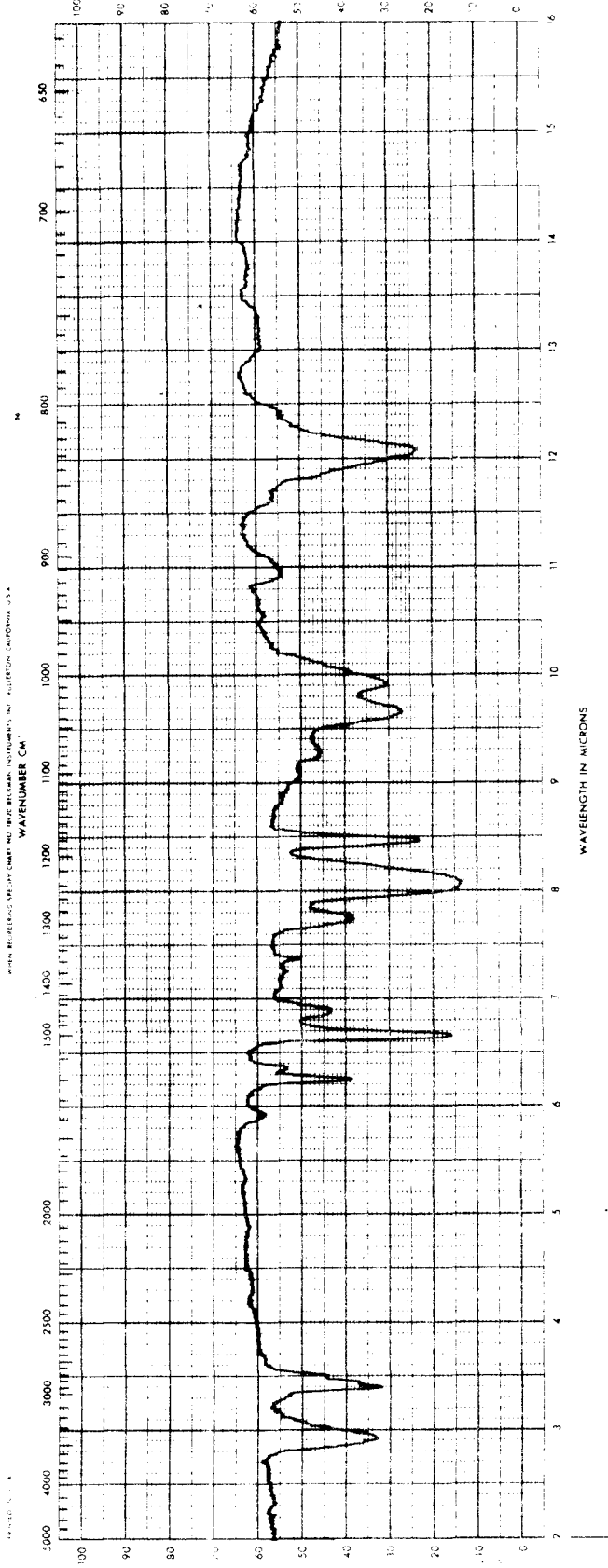
B - ALUMINUM EPOXY TOPCOAT (CM-1662)

1. Generic Type - Epoxy - Polyamide
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 40
 - b. Volatile content, %, maximum 60
 - c. Wt./gallon, pounds 8.5-10.5
 - d. Pot life @ 70°F, hours, minimum 12
 - e. Dry touch, minutes, maximum 45
 - f. Infra-red Spectra (aluminum epoxy) Pass
 - g. Infra-red Spectra (activator) Pass

C - THINNER (DM-I)

1. Physical Properties
 - a. Infra-red Spectra Pass

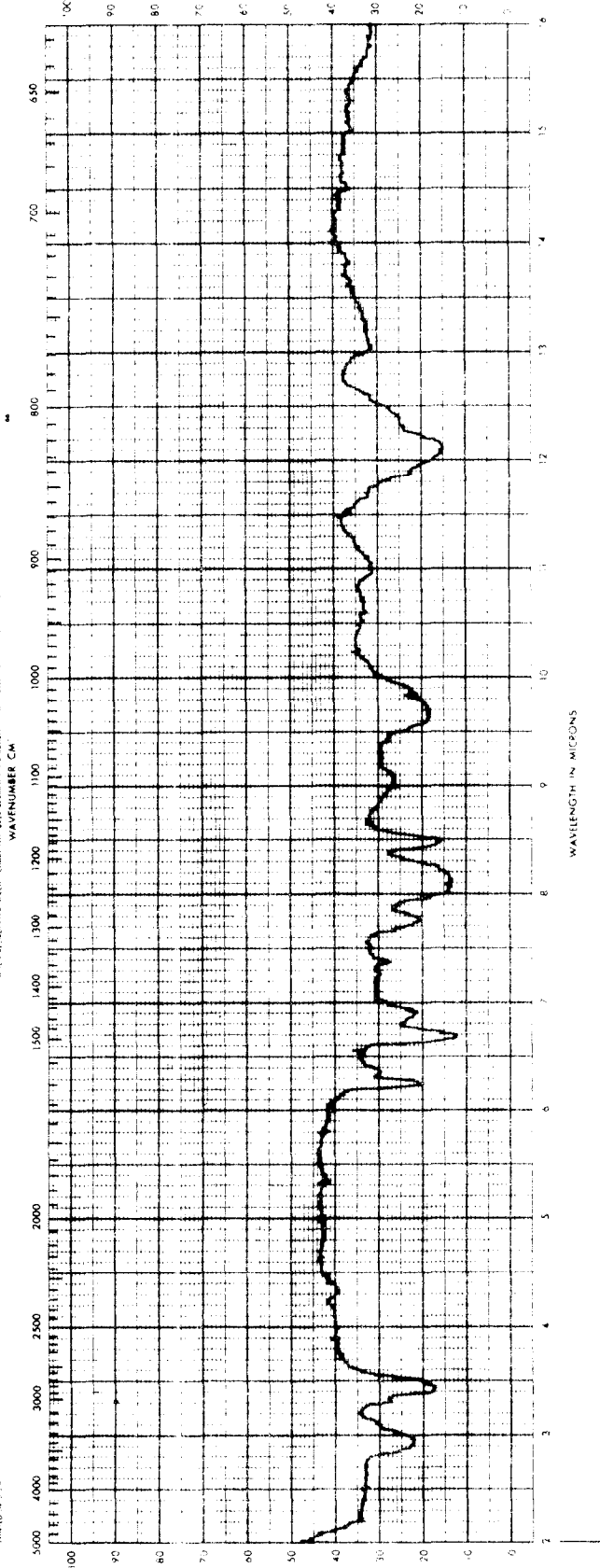




SPECTRUM NO. R-498
 DATE 4-2-63
 SAMPLE Organic Zinc
 Primer (DM 1144)
 Vehicle for Primer
 SOURCE ADMIRA PAINT 20
 STRUCTURE

PAT.
 SOLVENT
 CONCENTRATION
 PREPARE
 COMMENTS Film on
 Potassium Bromide
 Plate

ANALYST JCL
 Beckman
 INFRARED
 SPECTROSCOPY

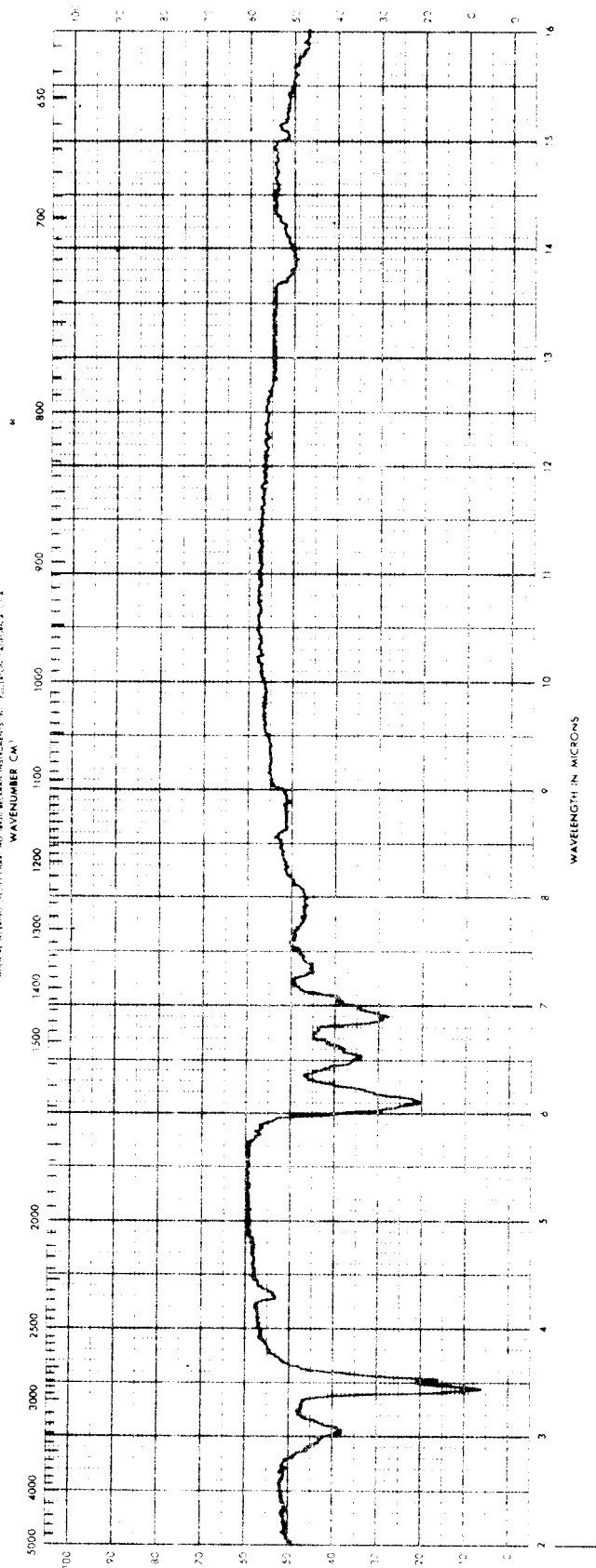


SPECIMEN NO. B-5380
DATE 4-9-69
SAMPLE Aluminum Epoxy
TOP Coat 12 M 1662
SOURCE ADM RA-2457-1
REFLECTOR

PHASE
SCANNING
CONCENTRATION
PHASE
COMMENT Film 20
Potassium Bromide
Film

ANALYST J. J. J.

Beckman
INFRARED
SPECTROPHOTOMETER

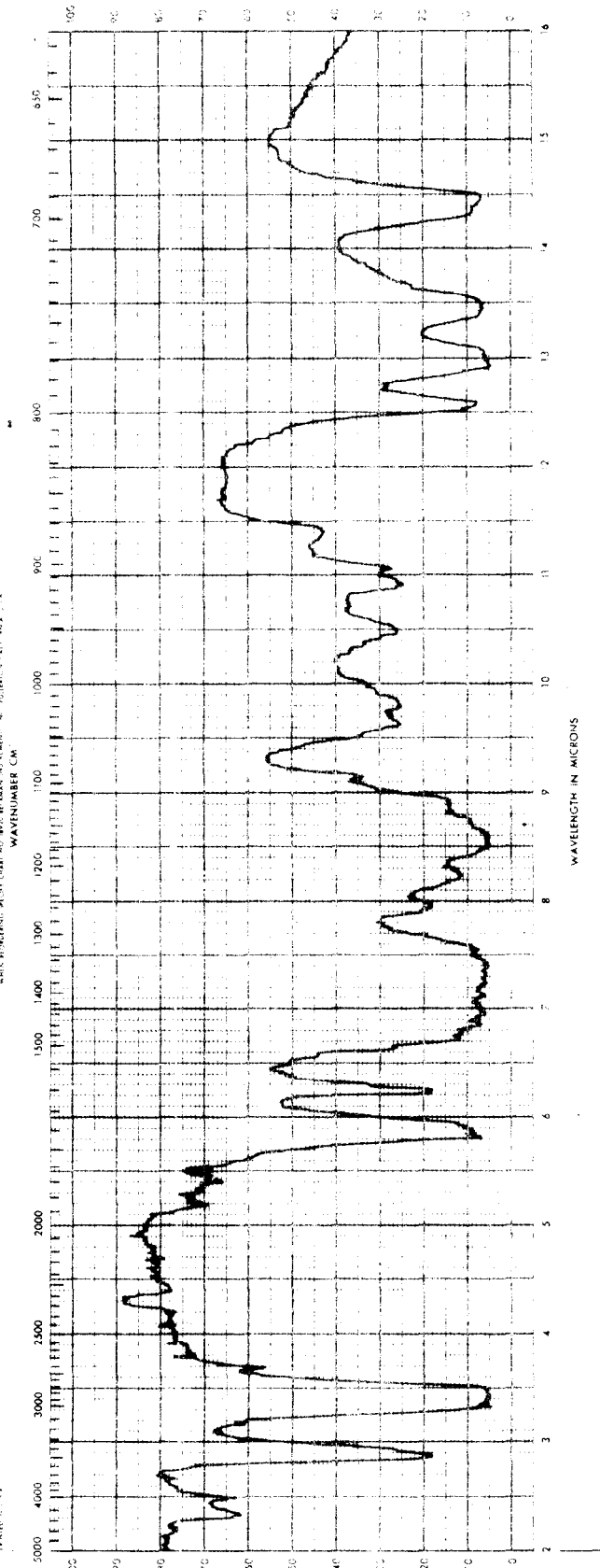


SPECTRUM NO. R-5381
 DATE: 4-9-62
 SAMPLE: Activated LDM 1662
 For Aluminum Eddy
 Top Coat LDM 1662
 SOURCE: ADMIRAL JUNT 55
 STRUCTURE

PATH: ...
 SOLVENT: ...
 CONCENTRATION: ...
 PHASE: ...
 COMMENTS: Film of
 Polystyrene Benzene
 Film
 ANALYST: J.C.T.

Beckman

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 SPECTROPHOTOMETER



SPECTRUM NO. R-5382
DATE 4-9-69
SAMPLE Field Thru:
IDM 12
SOLAR ADJUSTMENT FACTOR 1
STANDARD

ANALYST J.C.T.
Beckman
INSTRUMENT
SPECTROPHOTOMETER

SYSTEM # 5

SPECIFICATIONS

Carboline Company
328 Hanley Industrial Court
St. Louis, Missouri 63144

A - ORGANIC ZINC PRIMER (CARBOLINE 655)

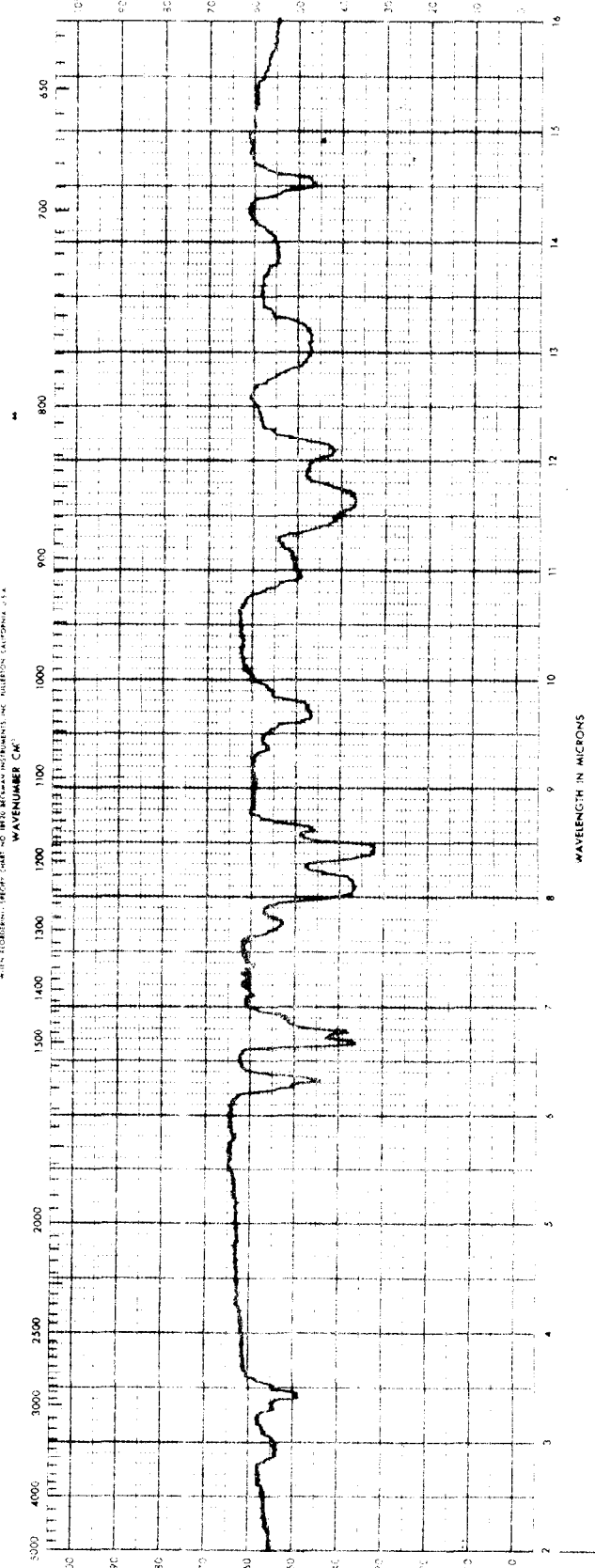
1. Generic Type - Epoxy - Polyamide
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 68
 - b. Volatile content, %, maximum 32
 - c. Wt./gallons, pounds, minimum 15
 - d. Pot life @ 70°F, minimum 6
 - e. Recoat time, hours, minimum 8
 - f. Dry touch, minutes, maximum 45
 - g. Infra-red Spectra (activator) Pass
 - h. Infra-red Spectra (zinc vehicle) Pass

B - GREY EPOXY TOPCOAT (CARBOLINE 190HB-W)

1. Generic Type - Epoxy - Polyamide
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 80.0
 - b. Volatile content, %, maximum 20.0
 - c. Wt./gallons, pounds 12-14
 - d. Pot life @ 70°F, hours, minimum 4
 - e. Dry touch, hours, maximum 1
 - f. Infra-red Spectra (190 HBW Activator) Pass
 - g. Infra-red Spectra (190 HBW) Pass

C - THINNER (CARBOLINE #15 & #25)

1. Physical Properties (Carboline #15)
 - a. Infra-red Spectra Pass
2. Physical Properties (Carboline #25)
 - a. Infra-red Spectra Pass



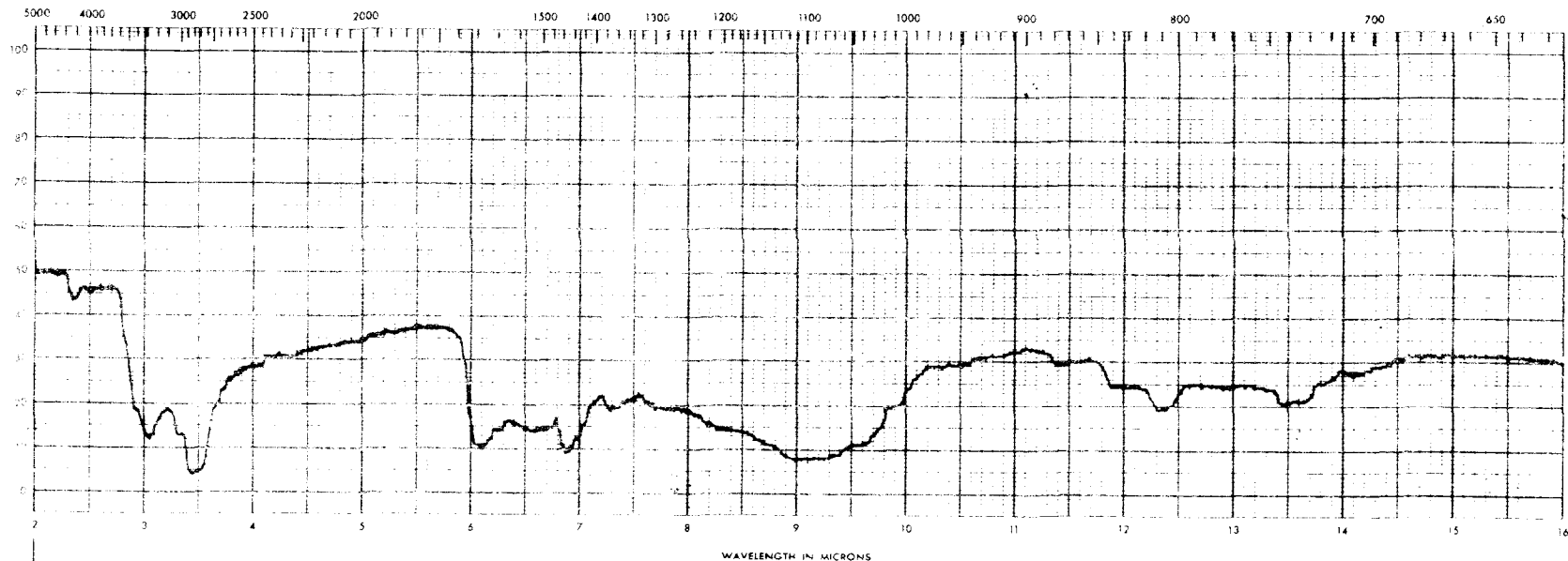
SPECTRUM NO. R-4961
 DATE 4-9-69
 SAMPLE Organic 2.15
 Primer, CARBOLINE 555
 VEHICLE
 SOLVENT CARBOLINE
 STRUCTURE
 PATH
 SOLVENT
 CONCENTRATION
 PRAC
 COMMENTS Film, 0.1
 Permeation, Bromine
 Plates
 ANALYST C.T.

Beckman

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 SPECTROPHOTOMETER

PRINTED IN U.S.A.

WHEN REORDERING SPECIFY CHART NO. 18920 BECKMAN INSTRUMENTS INC. FULLERTON, CALIFORNIA U.S.A.
WAVENUMBER CM

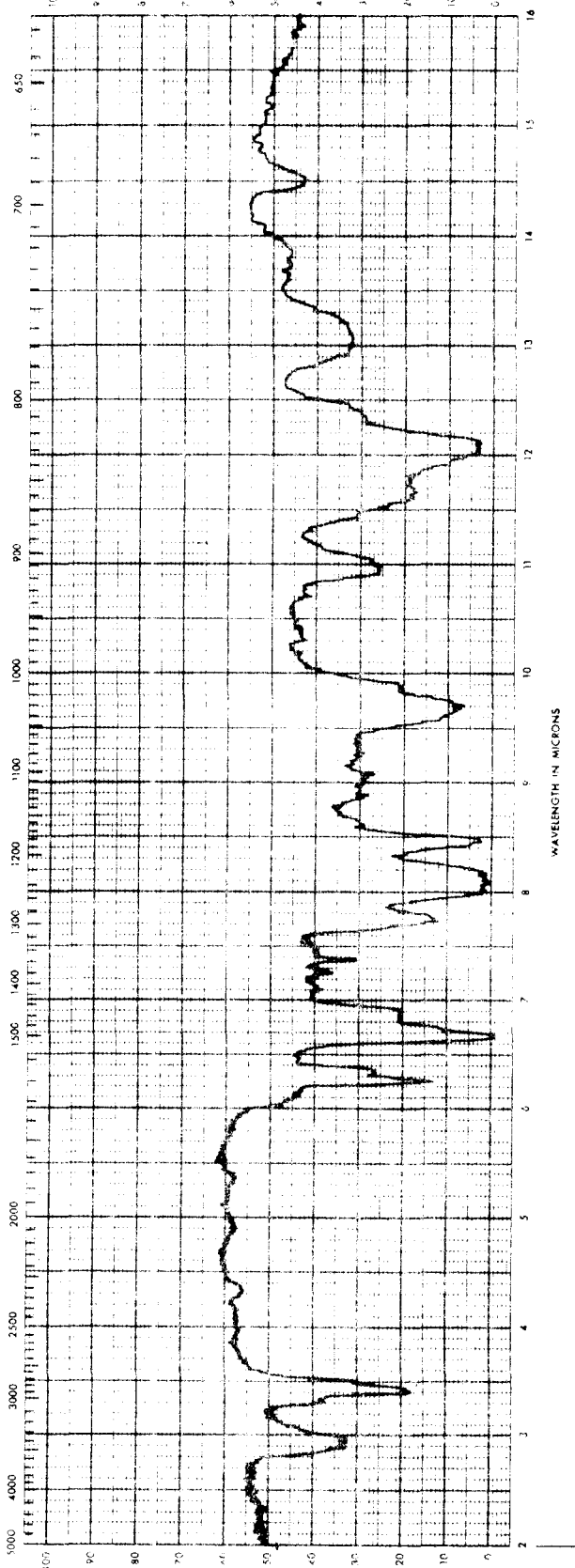


SPECTRUM NO. R-4962
DATE 4-9-69
SAMPLE Activator for
Organic Zinc Primer
(Carboline 655)
SOURCE CARBOLINE PAINT
STRUCTURE CO
PATH _____
SOLVENT _____
CONCENTRATION _____
PHASE _____
COMMENTS File on
Potassium Cyanide
Pellet
ANALYST J.C.T.

Beckman

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SPECTROPHOTOMETER

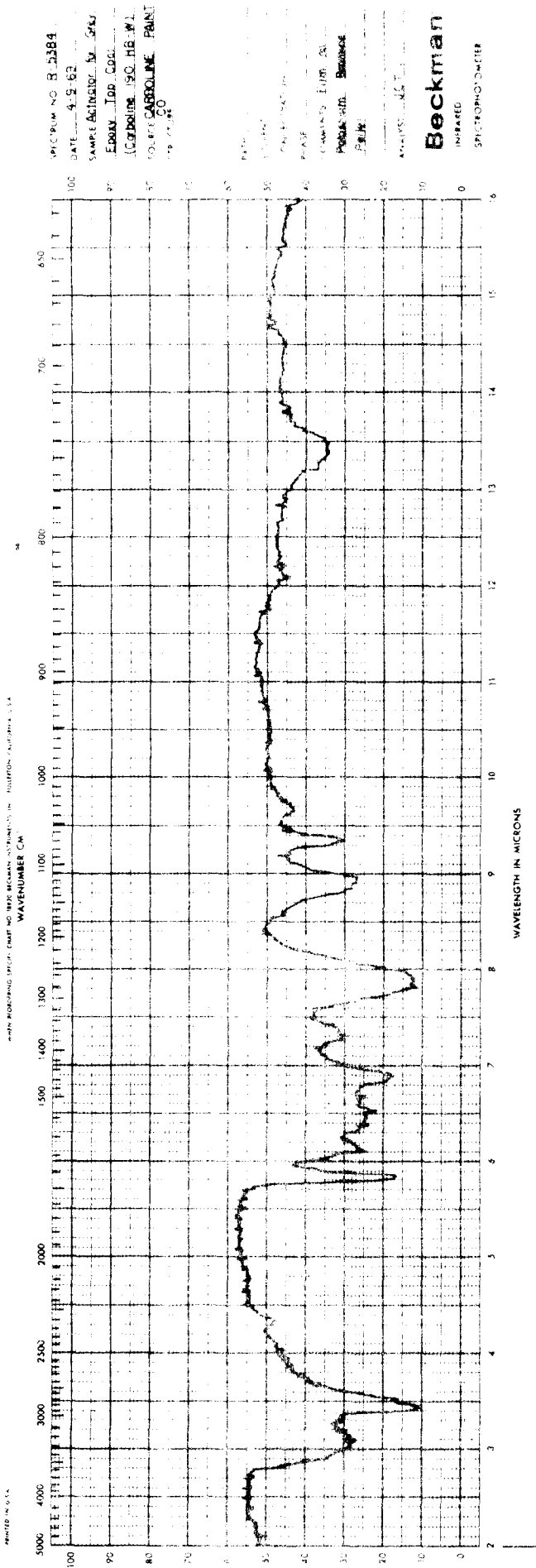
WATERMETER CM



SPECTRUM NO. R-5382
DATE 4-9-65
SAMPLE GEL. EDDY 100.000
CONCENTRATION 50.00 HB 10.00
SOLVENT CARBON TETR
STRUCTURE

PATH
CONCENTRATION
THICKNESS
COMMENTS EDDY 100.00
SOLVENT CARBON TETR
PURITY

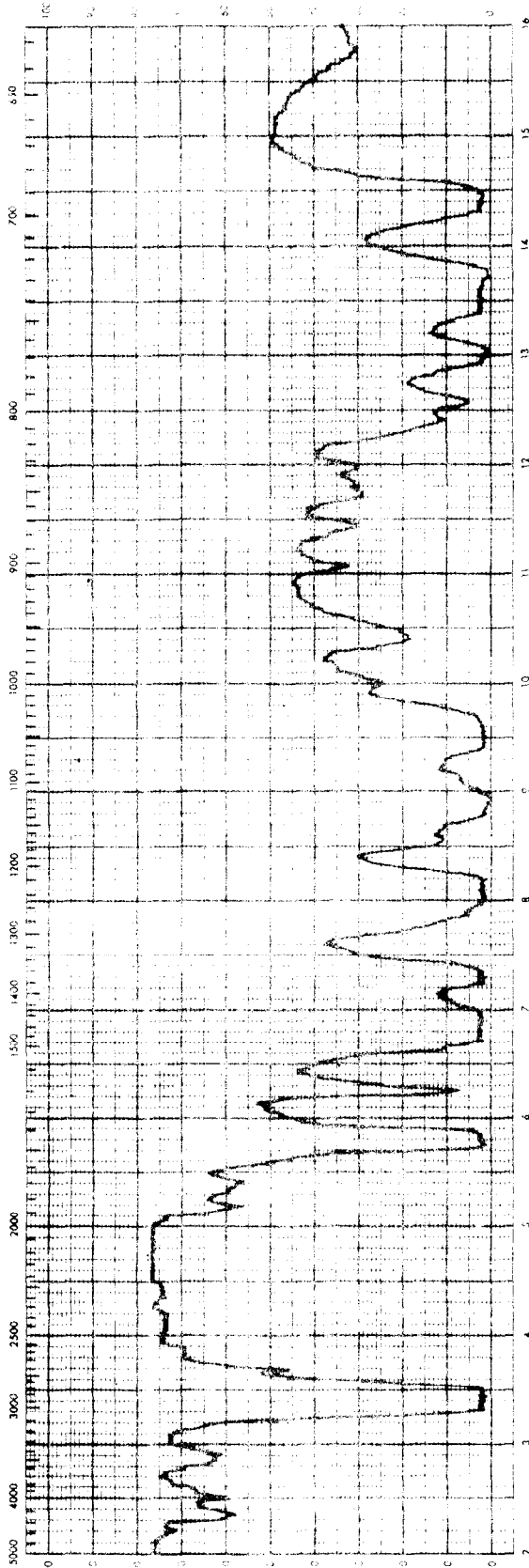
ANALYST J.C.I.
Beckman
INFRAC
SPECTROMETER



Beckman Model DU-4 Infrared Spectrophotometer, Model DU-4A

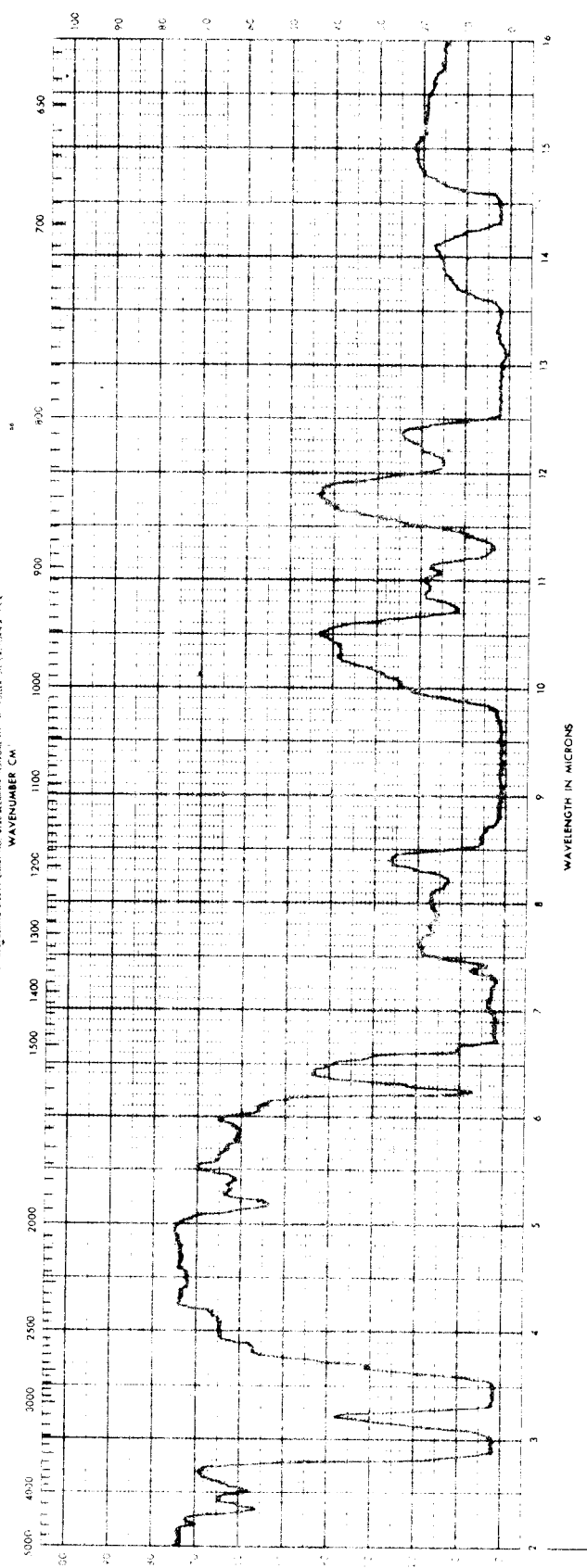
Beckman, Inc., Brea, California 92610

WAVENUMBER CM⁻¹



SPECTRUM NO. R-4964
DATE 4-9-69
SAMPLE PAK: Infrared
Calibration No. 25
C-100-2-12
C-100-2-12

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SPECTROPHOTOMETER



SPECTRUM NO. R-1565
 DATE 4-2-62
 SAMPLE PAINT THIN FILM
 (Cadmium, Pb, Sn)
 SOURCE CARBON LINE PAINT
 STRUCTURE
 PATH
 SOLVENT
 CONCENTRATION
 (Cadmium, Pb, Sn)
 Cadmium, Carbon, Lead, Tin
 ANALYST J.C.T.
Beckman
 INFRARED
 SPECTROMETER

SYSTEM # 6

SPECIFICATIONS

Napko Company
P. O. Box 14509
Houston, Texas 77021

A - ORGANIC ZINC PRIMER (NAPKO 2-Z)

1. Generic Type - Modified Polyhydroxy Ether Resin
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 72.0
 - b. Volatile content, %, maximum 28.0
 - c. Wt./gallon, pounds, minimum 17.0
 - d. Pot life @ 70°F, minimum 1 week
 - e. Recoat time, hours, minimum 5
 - f. Dry touch; minutes, maximum 30
 - g. Infra-red Spectra Pass

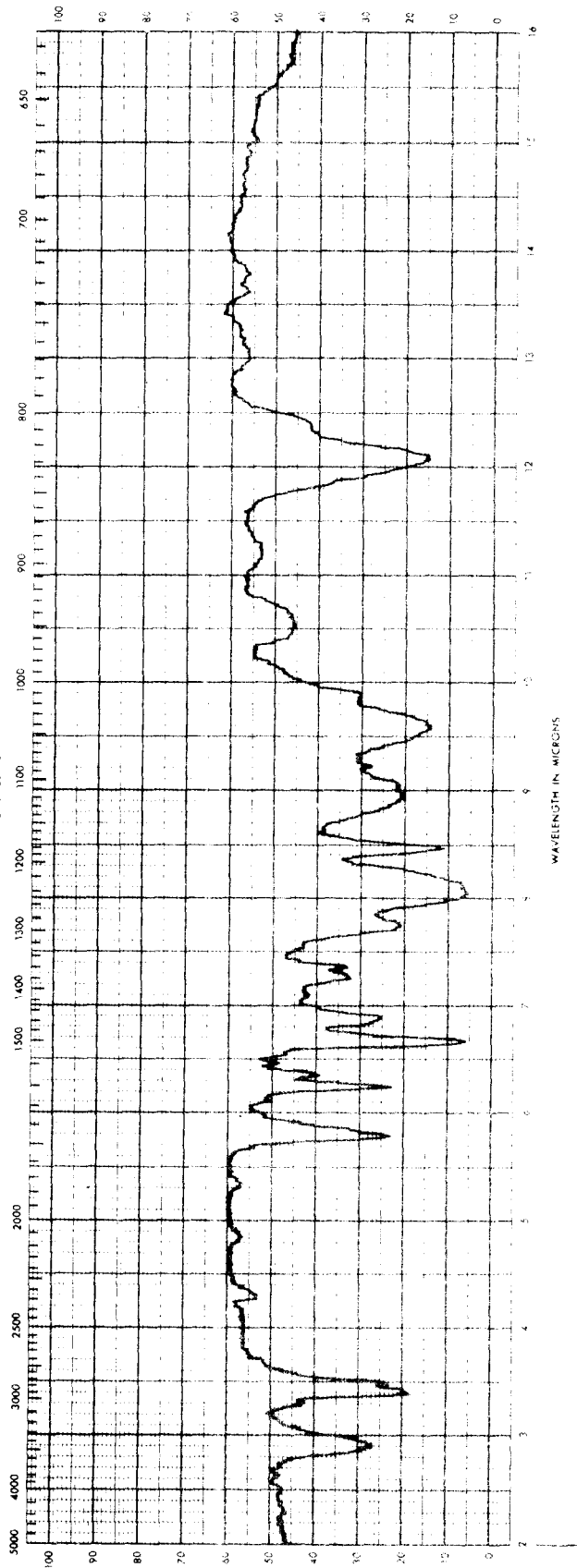
B - ALUMINUM GREY VINYL TOPCOAT (THIXOVIN NO. 5452)

1. Generic Type - Vinyl Copolymer
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 44.0
 - b. Volatile content, %, maximum 56.0
 - c. Wt./gallon, pounds 8.5-10.5
 - d. Pot life @ 70°F, hours, minimum 1 week
 - e. Dry touch, hours, maximum 1
 - f. Infra-red Spectra Pass
 - g. Infra-red Spectra Pass

C - THINNERS (NAPKO NOS. 218E AND 211L)

1. NAPKO NO. 218E - Physical Properties
 - a. Infra-red Spectra Pass
2. NAPKO NO. 211L - Physical Properties
 - a. Infra-red Spectra Pass

WAVELENGTH CHART



SPECTRUM NO. R-4966
DATE 5-6-69
SAMPLE Vehicle for
Zinc Primer
Paint No. 1355
SOURCE Hoke Paint Co.
STRUCTURE

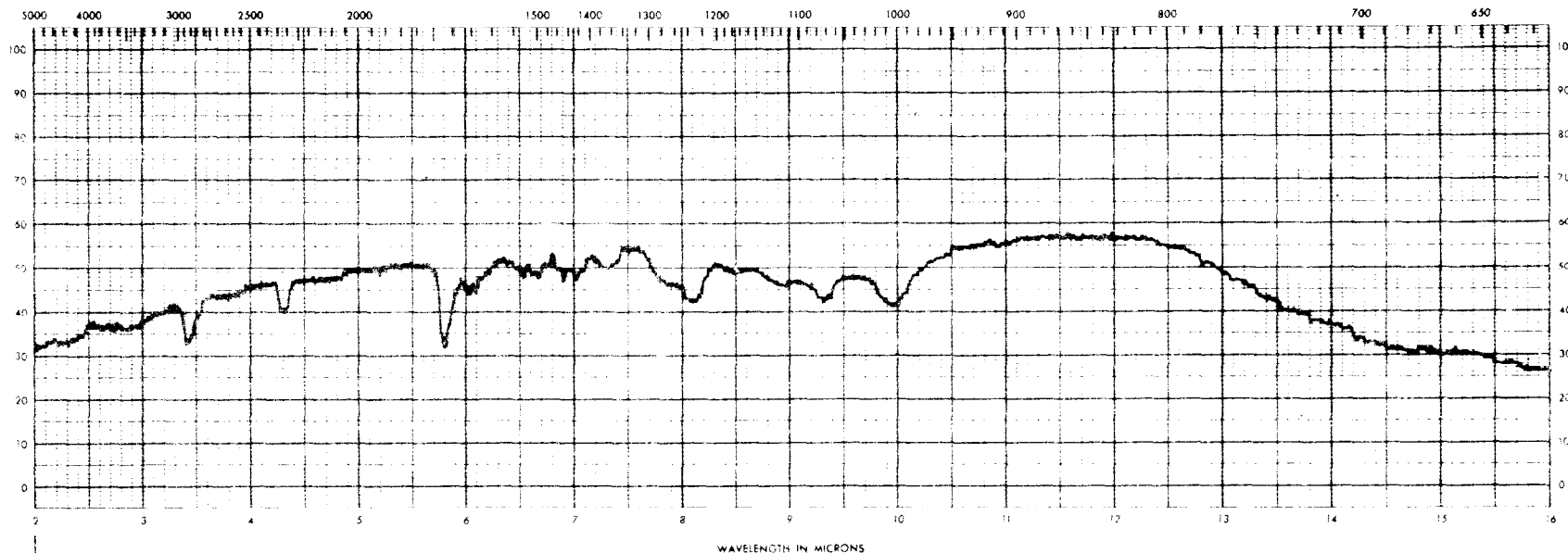
PART
SOLVENT
CONCENTRATION
THICKNESS
COMMENTS
Prepared by Hoke Paint
ANALYST

Beckman

INFRARED
SPECTROPHOTOMETER

WAVENUMBER CM

44



SPECTRUM NO. R-4970

DATE 5-6-69

SAMPLE Aluminum Gray

Topcoat Paint

No. 5452

SOURCE Napho Paint Corp.

STRUCTURE

PATH

SOLVENT

CONCENTRATION

PHASE

COMMENTS Film on Polyester

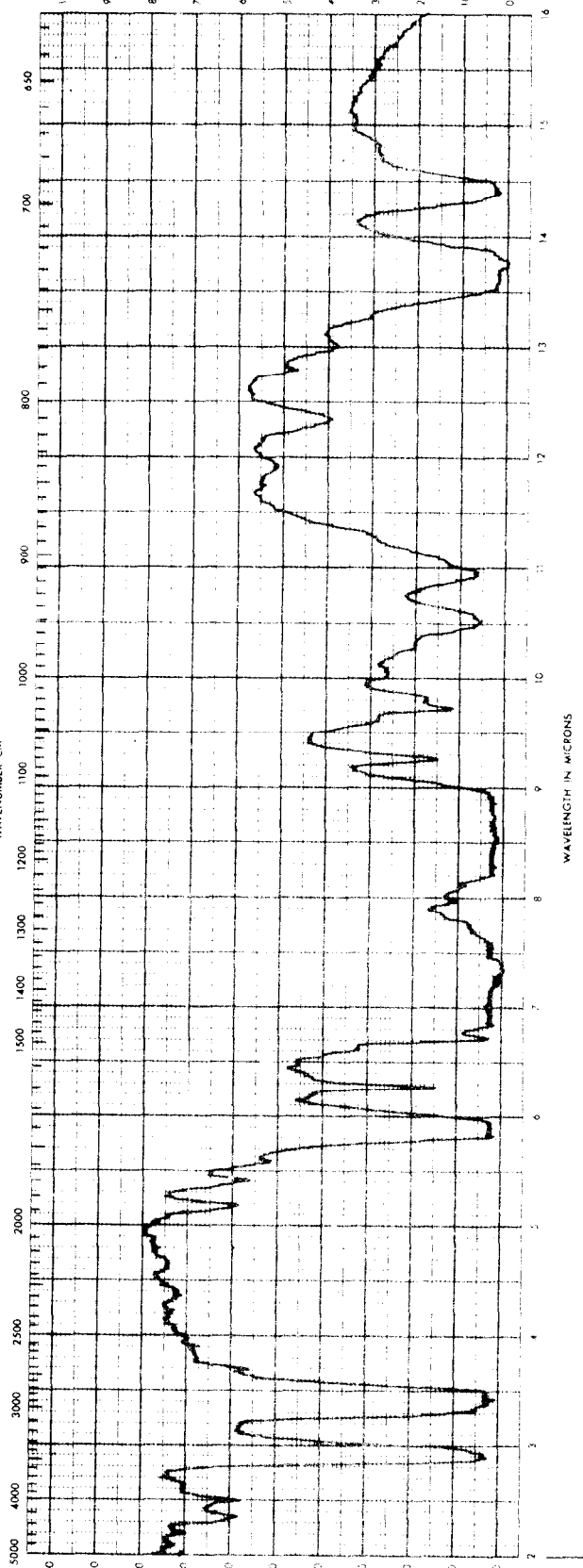
Bromide Pellet

ANALYST JCT

Beckman

INFRARED

SPECTROPHOTOMETER



SPECTRUM NO. R-4969
 DATE 5-8-69
 SAMPLE Thinner 210-E for
Zinc Primer Paint
 SOURCE NaNO₂ Point
119-0-01

PATH _____
 SOLVENT _____
 CONCENTRATION _____
 PHASE _____
 COMMENTS Between Sodium
Chloride Windows
 ANALYST JCT

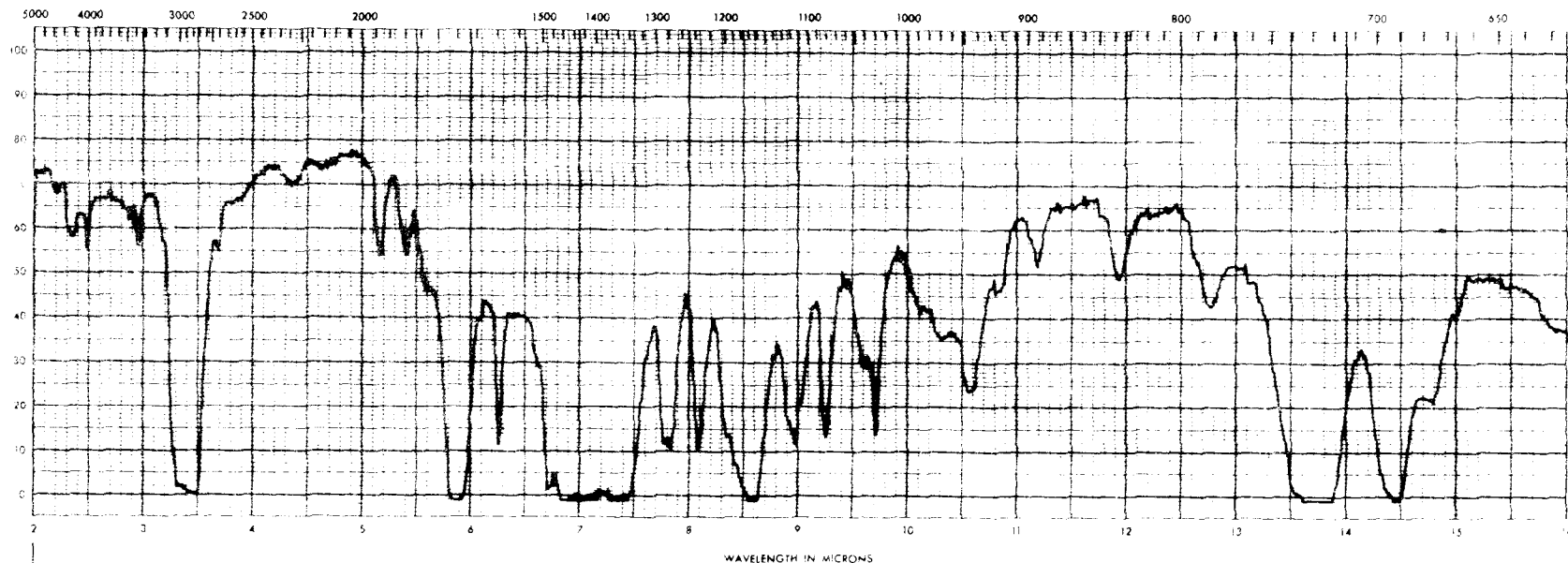
Beckman
 INFRARED
 SPECTROPHOTOMETER

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WHEN REORDERING SPECIFY CHART NO. 18930 BECKMAN INSTRUMENTS INC. FULLERTON, CALIFORNIA, U.S.A.

WAVENUMBER CM⁻¹

44



SPECTRUM NO. R-4968

DATE 5-6-69

SAMPLE THINNER 20% for

Aluminum Gray Topcoat

10

SOURCE Nippon Paint Corp

STR. 120

PATH 10

SCANNING

TECHN. ENTER. INC.

PHASE

COMMENT Between Sodium

Chloride windows

10

10

10

10

10

10

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10

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10

10

10

Beckman

INFRARED

SPECTROPHOTOMETER

SYSTEM # 7

SPECIFICATIONS

Enjay Chemical Company
1821 Wooddale Court
Baton Rouge, Louisiana 70806

A - ORGANIC ZINC PRIMER (RUST-BAN CR6875)

1. Generic Type - Chlorinated Rubber
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 72.0
 - b. Volatile content, %, maximum 28.0
 - c. Wt./gallon, pounds, minimum 19.0
 - d. Pot life @ 70°F, minimum 1 week
 - e. Recoat time, hours, minimum 3
 - f. Dry Touch, minutes, maximum 15
 - g. Infra-red Spectra Pass

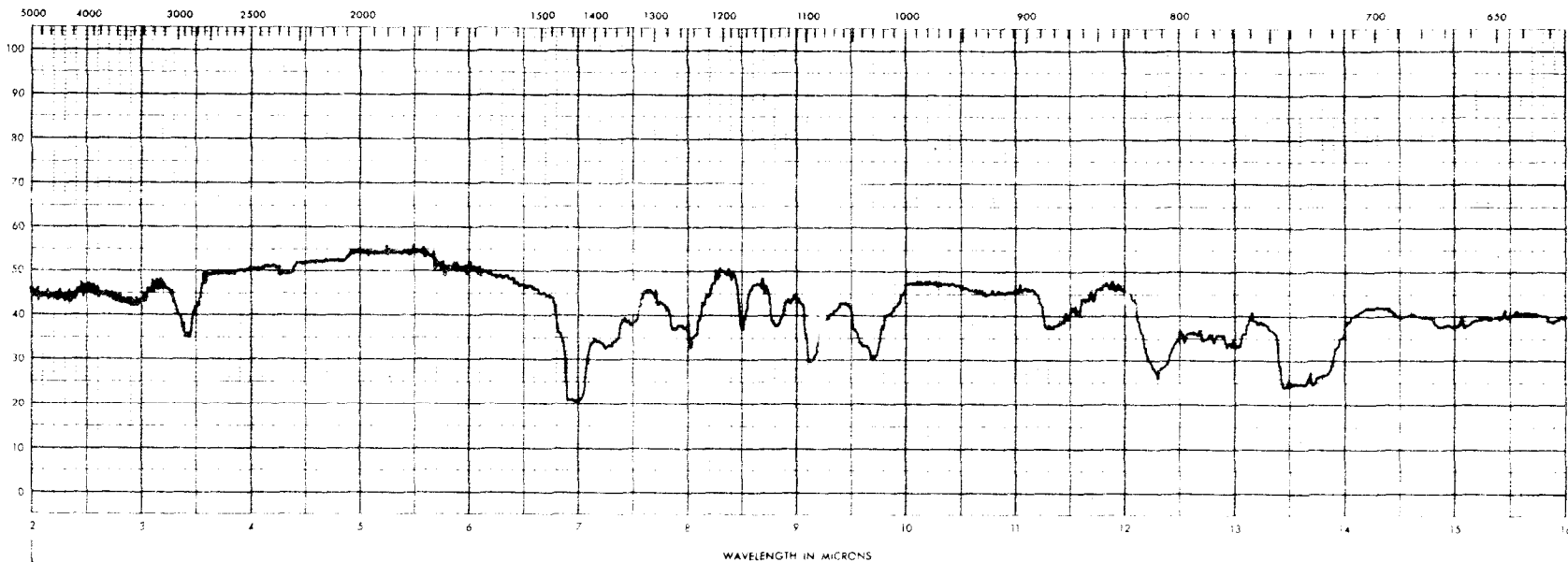
B - ALUMINUM TOPCOAT (RUST-BAN LD7198)

1. Generic Type - Chlorinated Rubber
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 51.0
 - b. Volatile content, %, maximum 49.0
 - c. Wt./gallon, pounds 9.0-11.0
 - d. Pot life @ 70°F, minimum 1 week
 - e. Dry touch, hours, maximum 1
 - f. Infra-red Spectra Pass

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WHEN ORDERING SPECIFY CHART NO. 18920 BECKMAN INSTRUMENTS INC. FULLERTON, CALIFORNIA U.S.A.

WAVENUMBER CM.



SPECTRUM NO. R-5446

DATE 5-6-69

SAMPLE Vehicle for

Zinc Primer Paint

CR-6875

SOURCE Enjoy Chemical

STRUCTURE

PATH

SOLVENT

CONCENTRATION

PHASE

COMMENTS Film on Potassium

Bromide Pellet

ANALYST JCT

Beckman

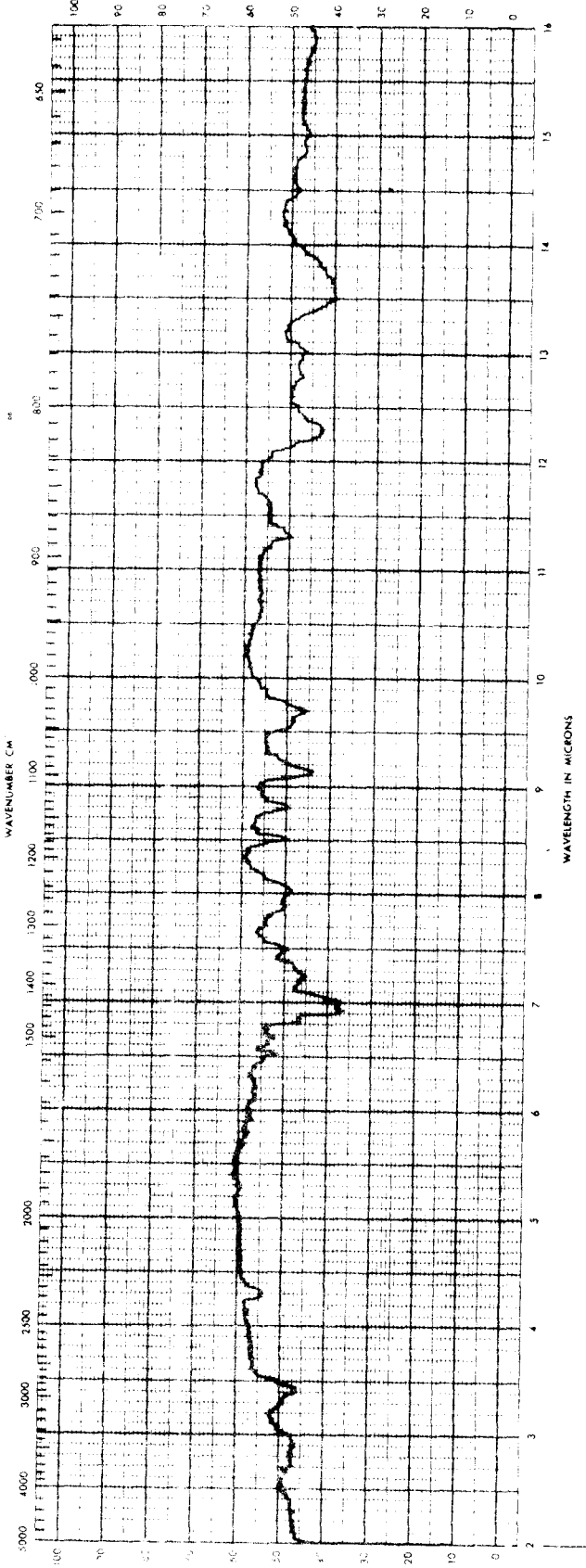
INFRARED

SPECTROPHOTOMETER

SPECTRUM NO R-5145
DATE 5-6-62
SAMPLE ALUMINUM CHLORIDE
SUBSTRATE POLAR
ID-71981
SOURCE EMERY CHARGED C.
STRUCTURE
PAT.
SOLVENT
CONCENTRATION
PHASE
COMMENTS FLUOROPOLYMER
REFLECTOR
ANALYST J.C.T.

Beckman

INFRARED
SPECTROMETER



SYSTEM # 8

SPECIFICATIONS

Mobil Corporation
Maintenance and Marine Coatings
P. O. Box 3431
Beaumont, Texas

A. Organic Zinc Primer (Mobil Zinc No. 4-P-22)

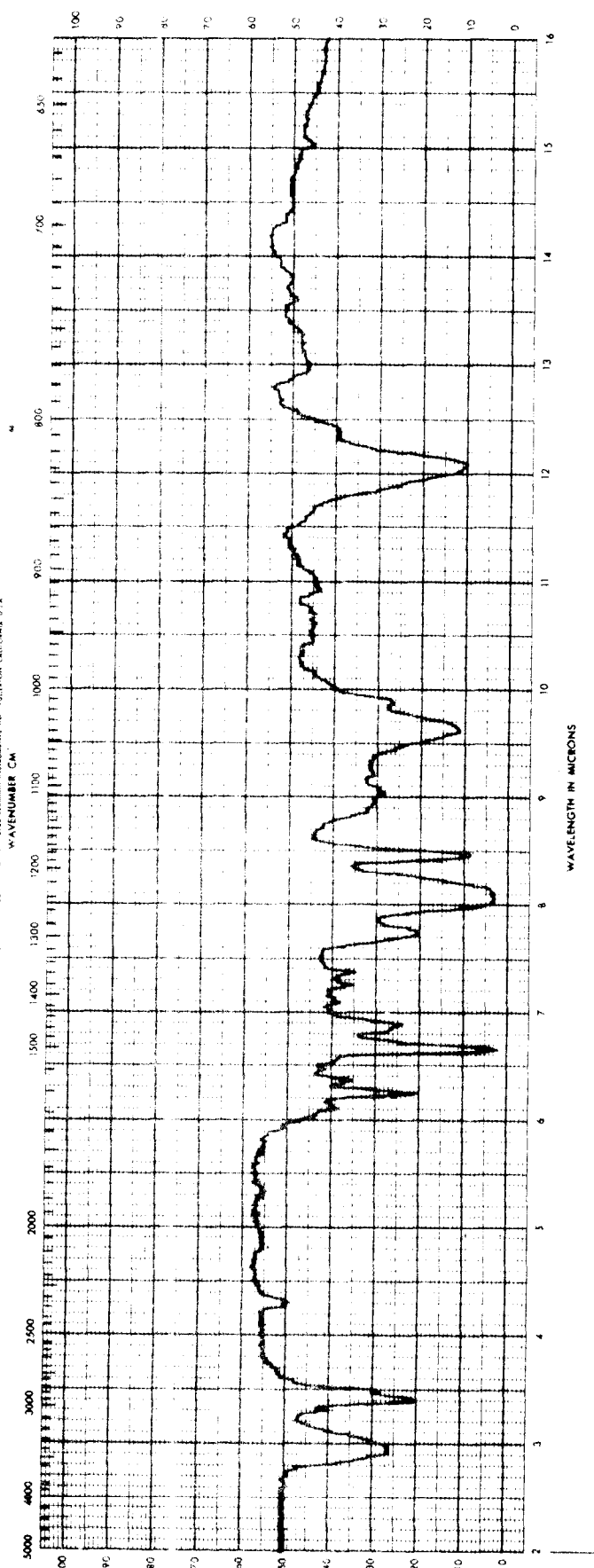
1. Generic Type - Epoxy, polyamide
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 80
 - b. Volatile content, %, maximum 20
 - c. Wt./gallon, lbs., minimum 20
 - d. Pot Life @ 70°F, hours, minimum 20
 - e. Recoat Time, hours, minimum 24
 - f. Dry Touch, minutes, maximum 45
 - g. Infra-red Spectra (Comp. A) Pass
 - h. Infra-red Spectra (Comp. B) Pass

B. Val-Chem Hi-Build Epoxy (89 Series V-6)

1. Generic Type - Epoxy, Polyamide
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 72.0
 - b. Volatile content, %, maximum 28.0
 - c. Wt./gallon, lbs., minimum 11-13
 - d. Pot Life @ 70°F, hours, minimum 24
 - e. Dry Touch, hours, maximum 5
 - f. Infra-red Spectra (Comp. A) Pass
 - g. Infra-red Spectra (Comp. B) Pass

C. Thinner (7-T-25)

1. Infra-red Spectra Pass

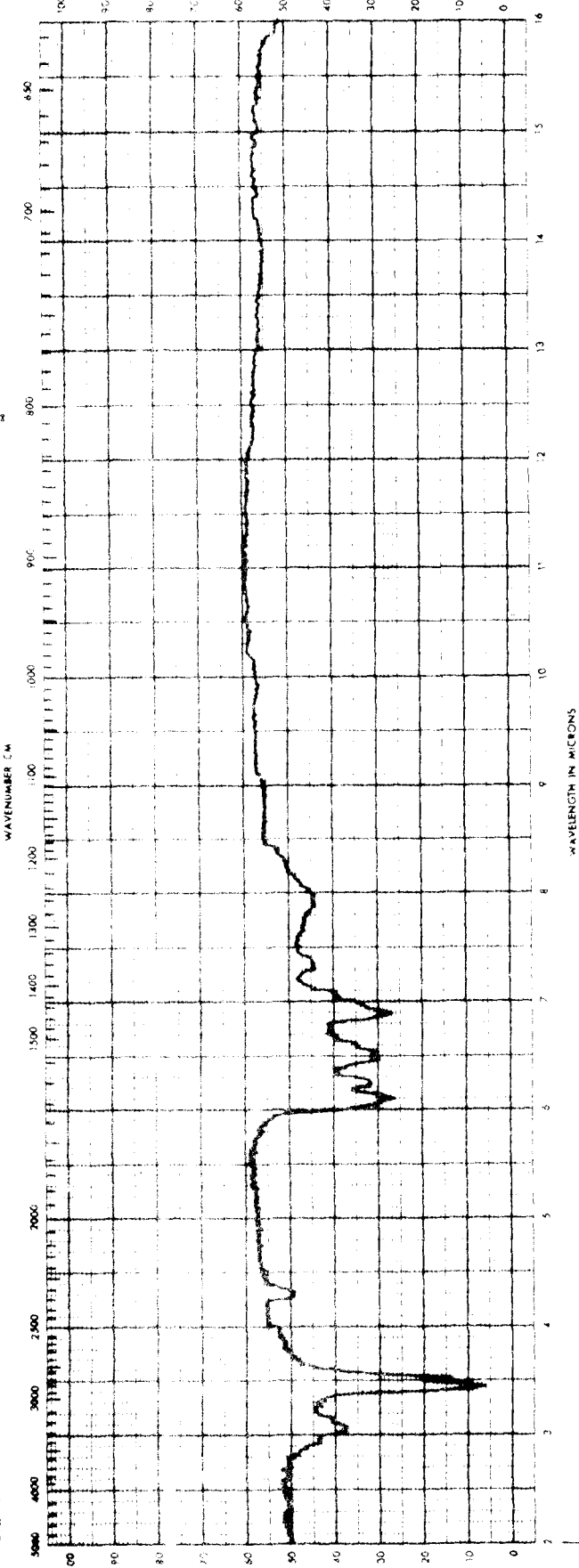


SPECTRUM NO. 7/3/58
 DATE 7/3/58
 SAMPLE Vehicle for
Mobil Zinc No. 5
 SOURCE Beckman Instrument Co.
 SPECTRUM

PATH ---
 SOLVENT ---
 CONCENTRATION ---
 PHASE ---
 COMMENTS ---

ANALYST J.C.T.

Beckman
 INFRARED
 SPECTROMETER

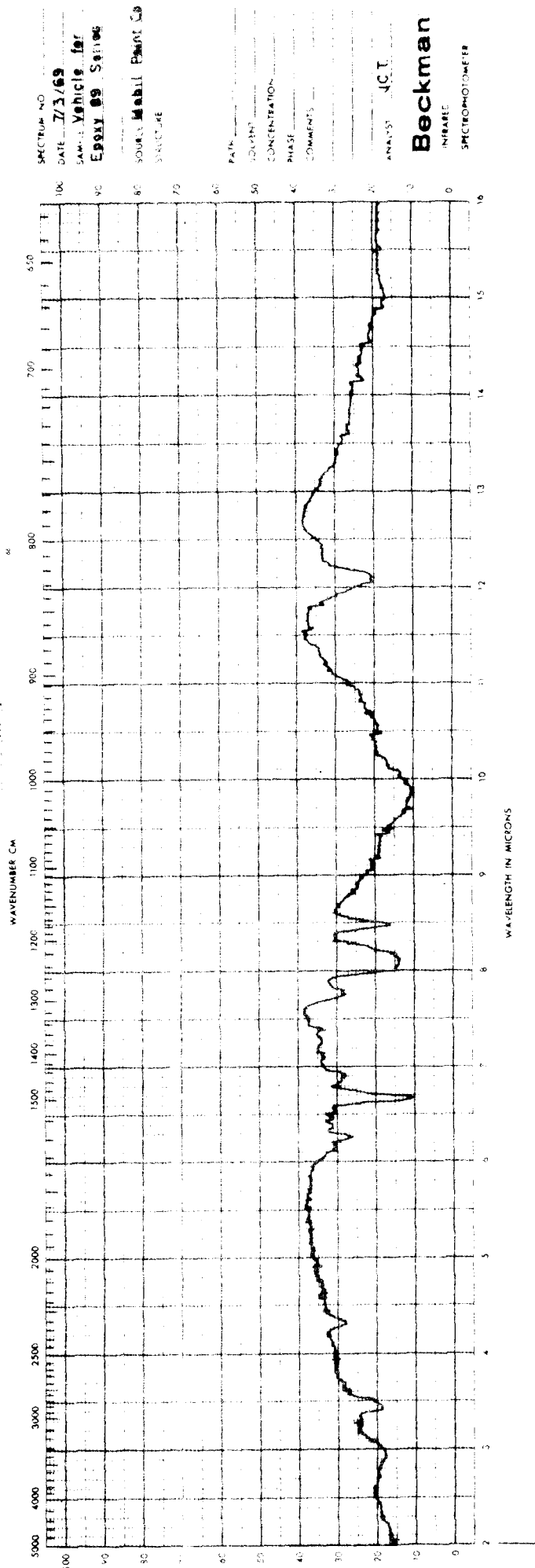


SPECTRUM NO. 73708
 DATE 7/3/68
 SAMPLE Carbonyl for
Methyl Zinc No. 5
 SOURCE MURRIE POSITIVE CS
 STRUCTURE

PATH
 SOLVENT
 CONCENTRATION
 PHASE
 COMMENTS

ANALYST JCT

Beckman
 INFRARED
 SPECTROMETER

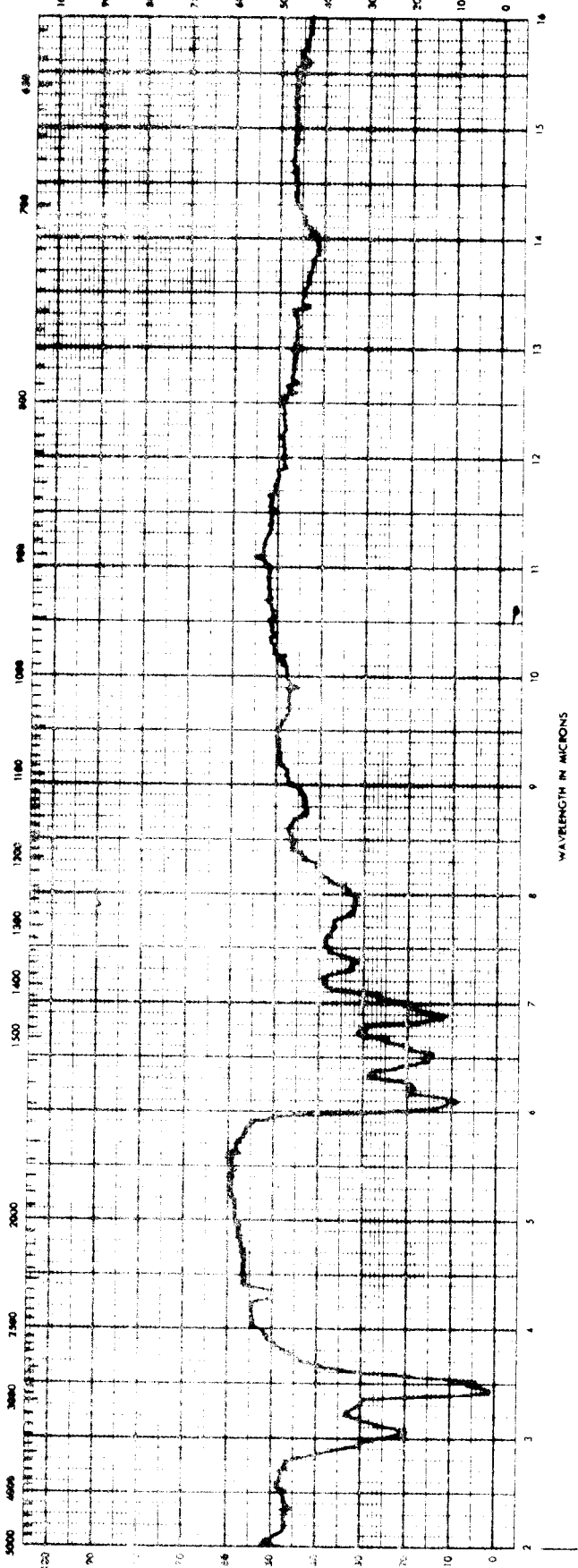


SPECTRUM NO. 273000
DATE 2/2/68
SAMPLE Concentration
EQUARY 80 Series
ANALYST J.C.I.
Beckman
SPECTROMETER

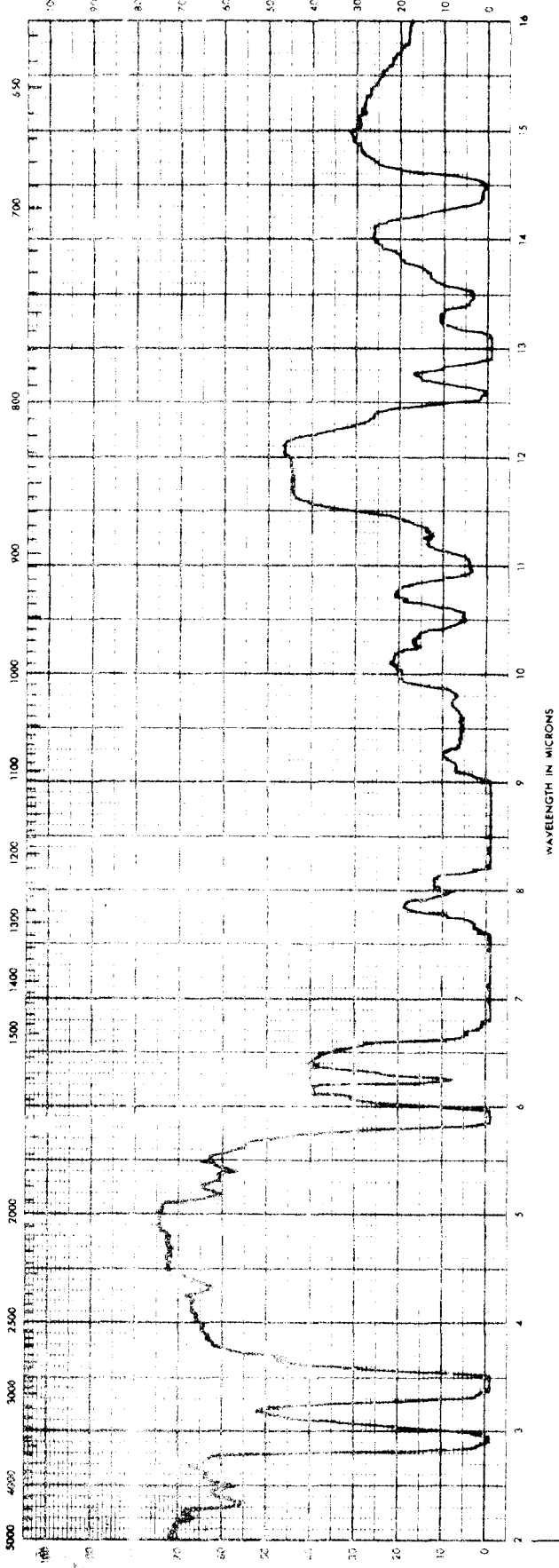
PATH 100
SOLVENT
CONCENTRATION
PHASE
COMMENTS

ANALYST J.C.I.

Beckman
SPECTROMETER



SPECTRUM NO. _____
DATE: **7/3/59**
SAMPLE: **Immer**
7-T-25
NO. REF. **M 0911** POINT: **9**
STRUCTURE _____
PATH _____
SOLVENT _____
CONCENTRATION _____
PHASE _____
COMMENTS _____
ANALYST: **J.C.T.**
Beckman
INFRARED
SPECTROMETER



SYSTEM # 9

SPECIFICATIONS

Southern Imperial Coatings Company
New Orleans, Louisiana

A - ORGANIC ZINC PRIMER (NO. X-50)

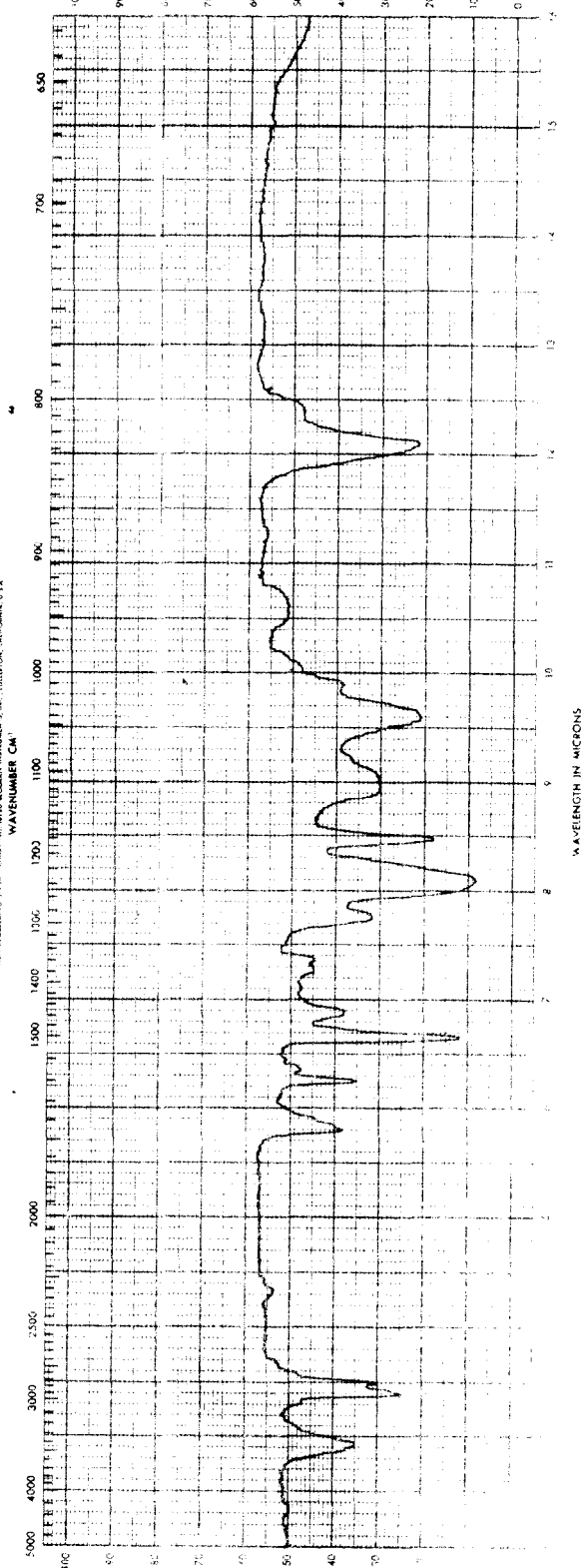
1. Generic Type - Modified Non-Catalyzed Epoxy Zinc Primer
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 55.0
 - b. Volatile content, %, maximum 45.0
 - c. Weight/gallon, pounds, minimum 13.0
 - d. Pot Life @ 70°F, minimum 6 weeks
 - e. Recoat Time, hours, minimum 24
 - f. Dry Touch, minutes, maximum 30
 - g. Infra-red Spectra Pass

B - GREY EPOXY TOPCOAT (JET SET NO. 120 HI-BUILD EPOXY)

1. Generic Type - Catalyzed Epoxy
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 60.0
 - b. Volatile Content, %, maximum 40.0
 - c. Weight/gallon, pounds 11.0
 - d. Pot Life @ 70°F, hours, minimum 12
 - e. Dry Touch, hours maximum 2
 - f. Infra-red Spectra (Comp. B) Pass
 - g. Infra-red Spectra (Comp. A) Pass

IR-100 RECORDING INSTRUMENTS, INC. FULLERTON, CALIFORNIA, U.S.A.

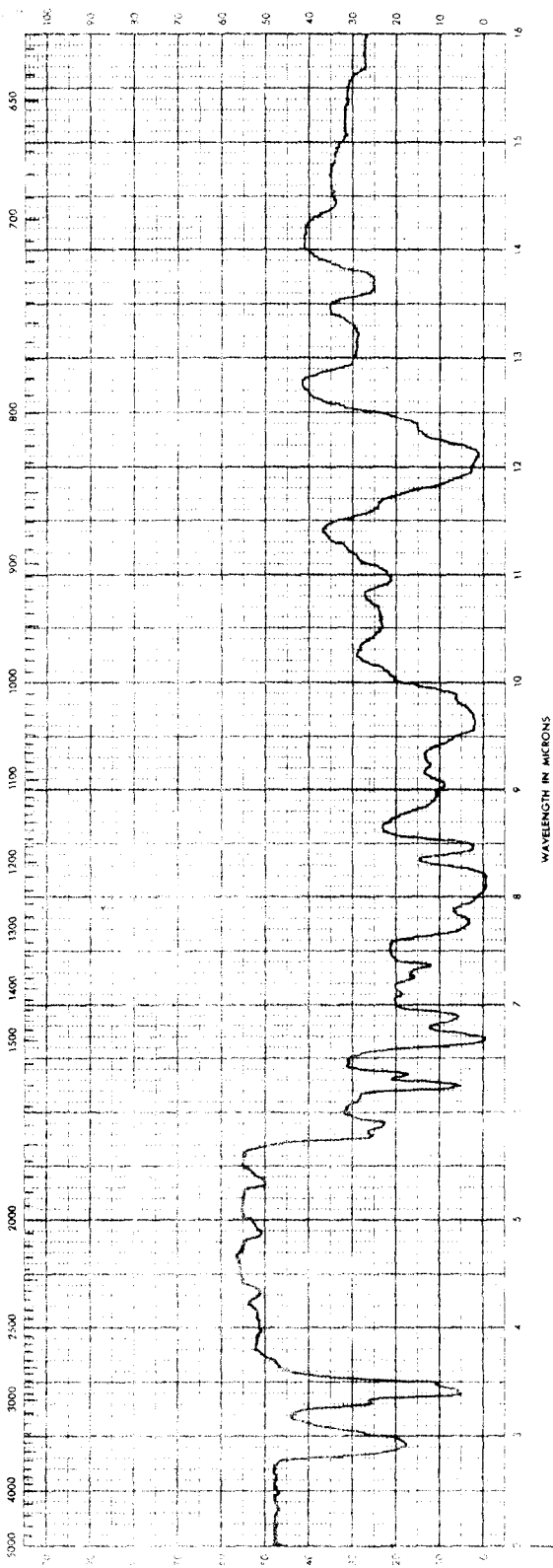
PRINTED IN U.S.A.



SPECTRUM NO. _____
DATE 7/23/69
SAMPLE ZINC RICH
STAINLESS STEEL
PRIMER NO. X50
SOURCE JULES K. IMPERIAL CORP.
STRUCTURE NEW ORLEANS, LA

PATH _____ mm
SOLVENT _____
CONCENTRATION _____
PHASE _____
COMMENTS FILM ON
POTASSIUM BROMIDE
PELLET
ANALYST JCT

Beckman
INFRARED
SPECTROPHOTOMETER

WAVENUMBER CM⁻¹

SPECTRUM NO.

DATE 7/23/69

SAMPLE JET SET 120

HI-BUILD EPOXY

TOP COAT

SOURCE SOUTHERN IMPERIAL CO

STRUCTURE NEW ORLEANS, LA.

PATH

SOLVENT

CONCENTRATION

PHASE

COMMENTS FILM ON

POTASSIUM BROMIDE

PELLET

ANALYST JCT

Beckman

INFRARED

SPECTROPHOTOMETER

SYSTEM # 10

SPECIFICATIONS

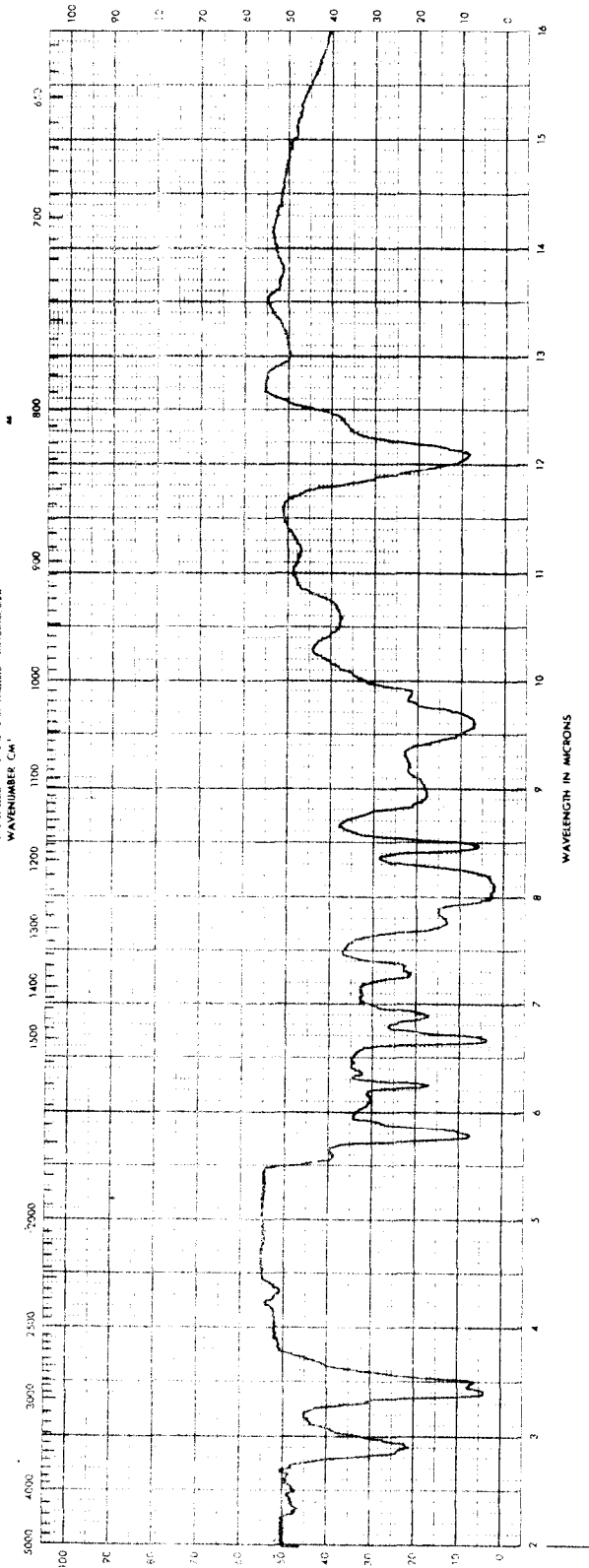
By Water Sales
1620 Franklin Avenue
New Orleans, Louisiana

A - ORGANIC ZINC PRIMER (OZR NO. 309)

1. Generic Type - Polymeric Organic Zinc Rich
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 71.0
 - b. Volatile content, %, maximum 29.0
 - c. Weight/gallon, pounds, minimum 17.0
 - d. Pot Life @ 70°F, minimum 12 hours
 - e. Recoat Time, hours, minimum 24
 - f. Dry Touch, minutes, maximum 30
 - g. Infra-red Spectra Pass

B - GREY EPOXY TOPCOAT (BYCO NO. 30)

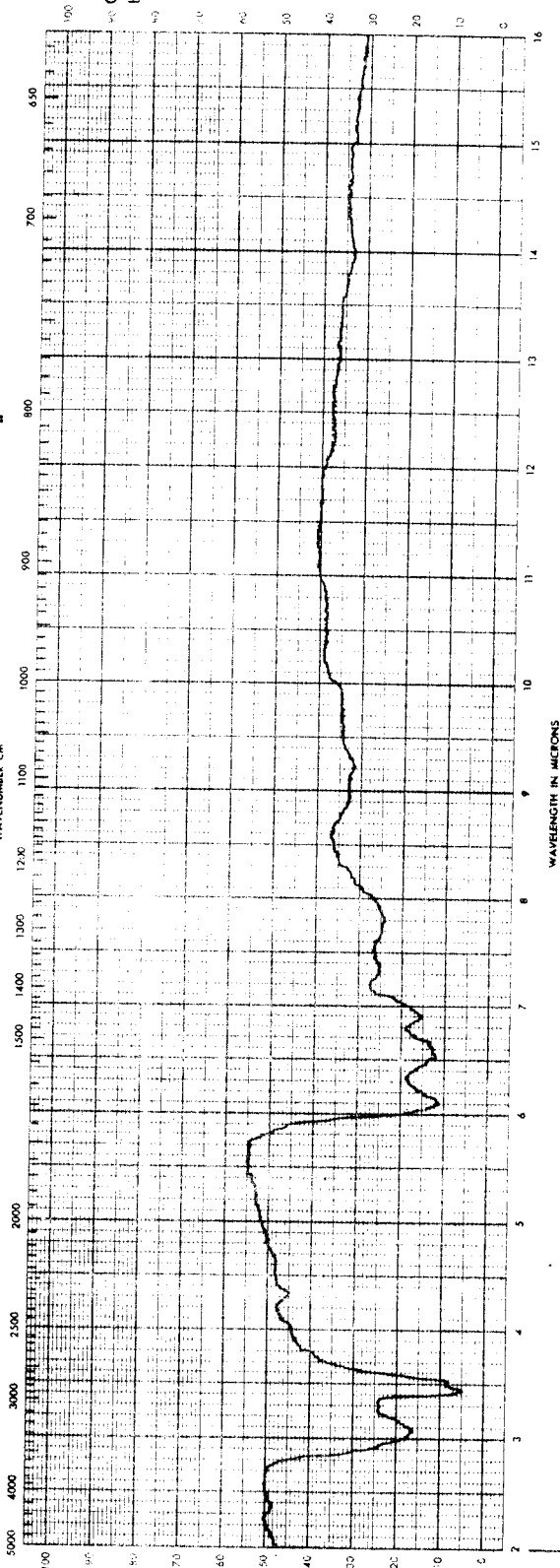
1. Generic Type
2. Dry Film Thickness 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 62.0
 - b. Volatile content, %, maximum 38.0
 - c. Weight/gallon, pounds 10.0
 - d. Pot Life @ 70°F, hours, minimum 12
 - e. Dry Touch, hours, maximum 2
 - f. Infra-red Spectra (Comp. B) Pass
 - g. Infra-red Spectra (Comp. A) Pass



SPECTRUM NO. 7-23-69
 DATE 7-23-69
 SAMPLE POTASSIUM BROMIDE
ZINC PRIMER NO. 308
GREEN GRAY
ST. LOUIS, MISSOURI
ST. LOUIS, MISSOURI

PATH _____
 SOLVENT _____
 CONCENTRATION _____
 PHASE _____
 COMMENTS FILM ON
POTASSIUM BROMIDE
PELLET

ANALYST JCT
Beckman
 INFRARED
 SPECTROPHOTOMETER

WAVENUMBER CM^{-1} 

SPECTRUM NO. _____

DATE 7/23/69

SAMPLE BYOQ NO.30

CATALYST FOR NO.30

LIGHT GREY TOP COAT

SOURCE BY WATER SALES CO

STRUCTURE NEW ORLEANS, LA

PATH _____

SOLVENT _____

CONCENTRATION _____

PHASE _____

COMMENTS FILM ON

POTASSIUM BROMIDE

PELLET

ANALYST JCT

Beckman

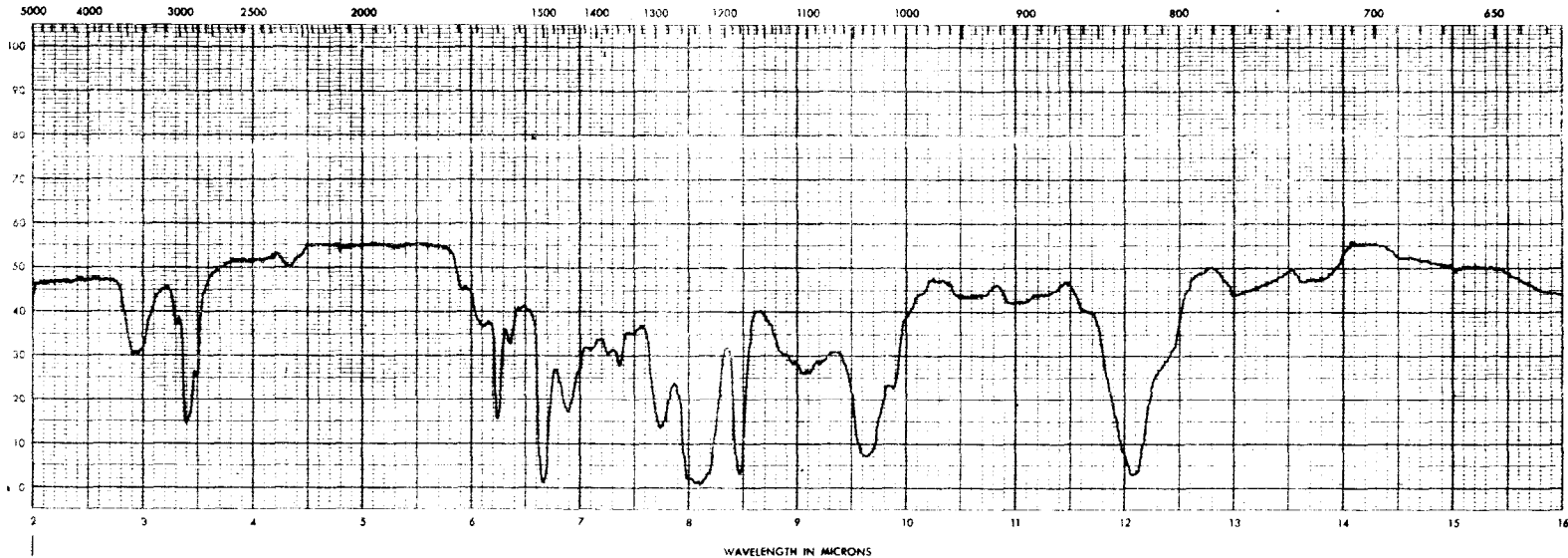
INFRARED

SPECTROPHOTOMETER

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WHEN REORDERING SPECIFY CHART NO. 18770 BECKMAN INSTRUMENTS, INC. FULLERTON, CALIFORNIA U.S.A.

WAVENUMBER CM⁻¹



SPECTRUM NO. _____

DATE 7/23/69

SAMPLE NO. 30 EPOXITE

LT GREY EPOXITE

(2623) TOP COAT

SOURCE BI-WATER SALES CO.

STRUCTURE _____

PATH _____

SOLVENT _____

CONCENTRATION _____

PHASE _____

COMMENTS FILM ON

POTASSIUM BROMIDE

PELLET

ANALYST JCT

Beckman

INFRARED

SPECTROPHOTOMETER

SYSTEM # 11

SPECIFICATIONS

Prufcoat Paint Co.
Grow Chemical Co.
Baton Rouge, Louisiana

A - ORGANIC ZINC PRIMER

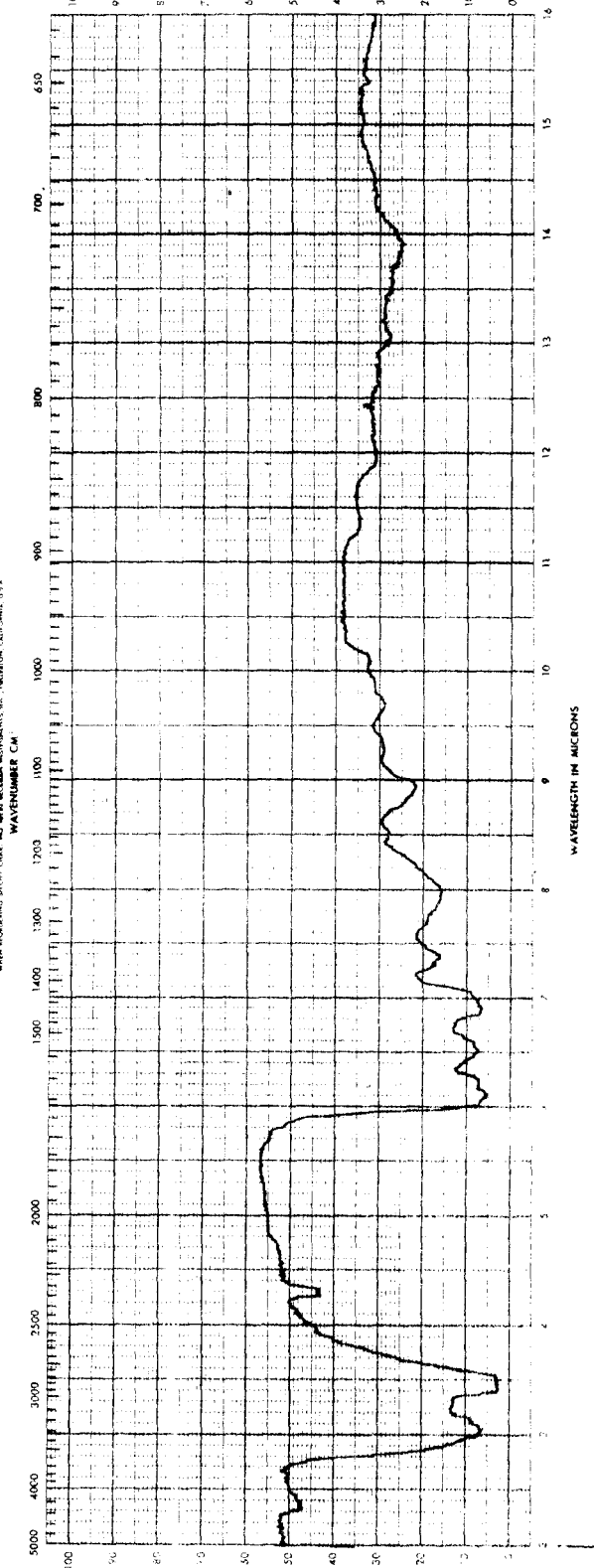
1. Generic Type - Epoxy-Zinc Rich
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 86.0
 - b. Volatile content, %, maximum 14.0
 - c. Weight/gallon, pounds, minimum 23.0
 - d. Pot Life @ 70°F, minimum 12 hours
 - e. Recoat Time, hours, minimum 24 hours
 - f. Dry Touch, minutes, maximum 30
 - g. Infra-red Spectra (Vehicle) Pass
 - h. Infra-red Spectra (Activator) Pass

B - LIGHT GREY EPOXY TOPCOAT

1. Generic Type - Epoxy Polyamide
2. Dry Film Thickness - 3.0 mils minimum
3. Physical Properties
 - a. Solids content, %, minimum 60.0
 - b. Volatile Content, %, maximum 40.0
 - c. Weight/gallon, pounds, minimum 10.0
 - d. Pot Life @ 70°F, hours, minimum 12
 - e. Dry Touch, hours, maximum 1
 - f. Infra-red Spectra (Comp. B) Pass
 - g. Infra-red Spectra (Comp. A) Pass

C - THINNER

1. Infra-red Spectra Pass

WAVENUMBER CM⁻¹

GRAPH 1

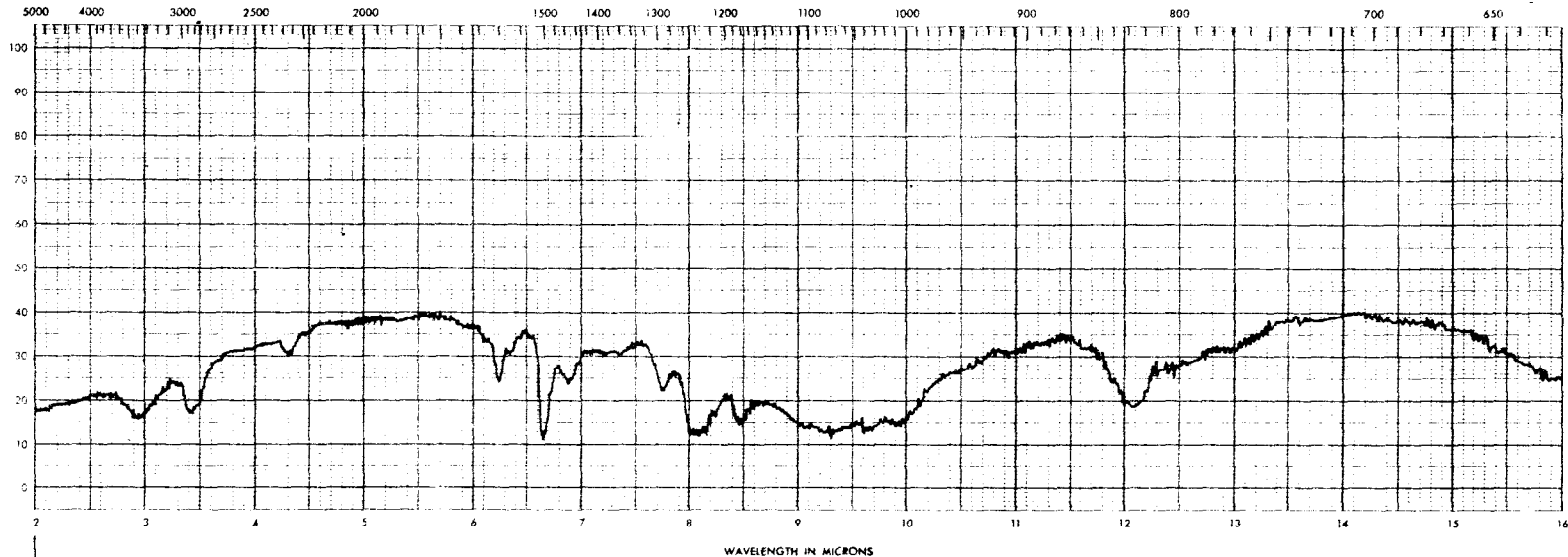
SPECTRUM NO. _____
 DATE 5-6-68
 SAMPLE CATALYST FOR
 ZINCPRIME 500
 PRIMER _____
 SOURCE GREEN-GUM-60
 STRUCTURE BATON-ROUGE, LA

PATH _____
 SOLVENT _____
 CONCENTRATION _____
 PHASE _____
 COMMENTS FILM ON
 POTASSIUM BROMIDE
 PELLETS
 ANALYST JEH

Beckman
 INFRARED
 SPECTROPHOTOMETER

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WHEN REORDERING SPECIFY CHART NO. 1970 BECKMAN INSTRUMENTS INC. FULLERTON, CALIFORNIA, U.S.A.
WAVENUMBER CM⁻¹



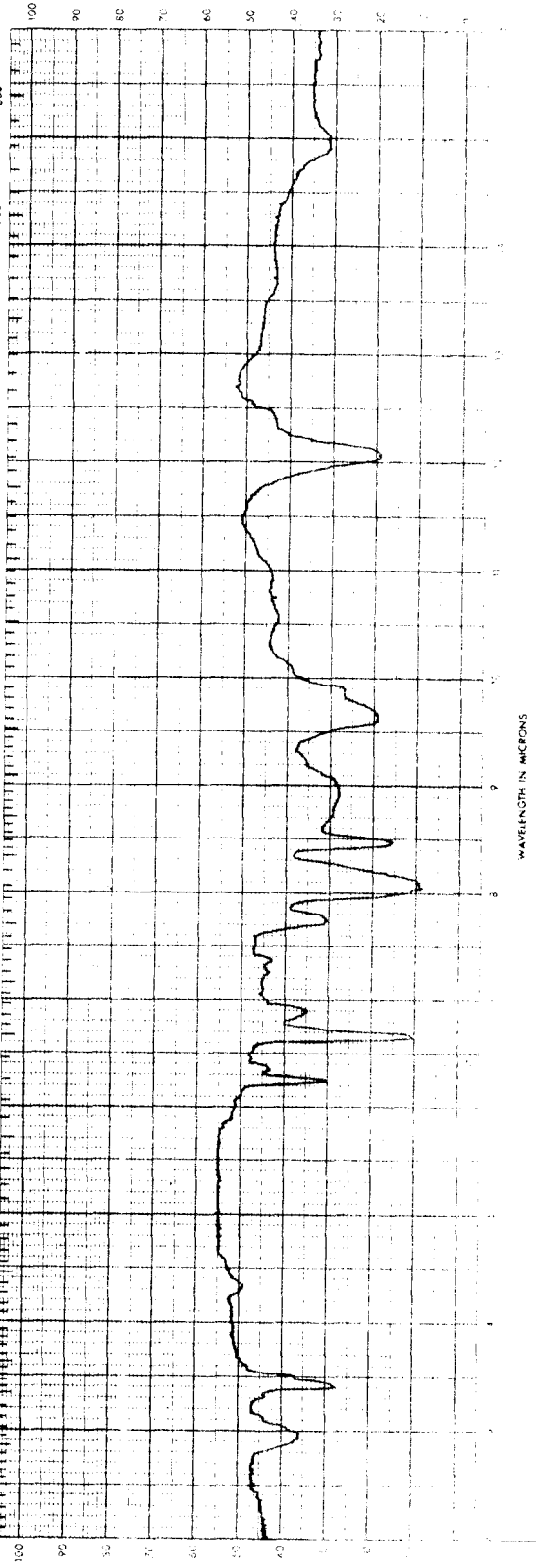
GRAPH 2

SPECTRUM NO. _____
DATE 5-6-69
SAMPLE ZINCPRIME 100
PRIMER VEHICLE
SOURCE GROW CHEM CO
STRUCTURE BATON ROUGE, LA
PATH _____
SOLVENT _____
CONCENTRATION _____
PHASE _____
COMMENTS FILM ON
POTASSIUM BROMIDE
PELLET
ANALYST JCF

Beckman
INFRARED
SPECTROPHOTOMETER

IR-100 INFRARED SPECTROGRAPH, MODEL NO. 100, BECKMAN INSTRUMENTS, INC., FULLERTON, CALIFORNIA, U.S.A.

GRAPH 4



SPECTRUM NO. _____
 DATE 7-23-69
 SAMPLE 1-5 SERIES
EPOXY LT. GRAY
TOP COAT
 SOURCE GRW CHEM CORP
 STRUCTURE BATON ROUGE, LA.
 PATH _____
 SOLVENT _____
 CONCENTRATION _____
 PHASE _____
 COMMENTS FILM ON
POTASSIUM BROMIDE
PELLET
 ANALYST EEI

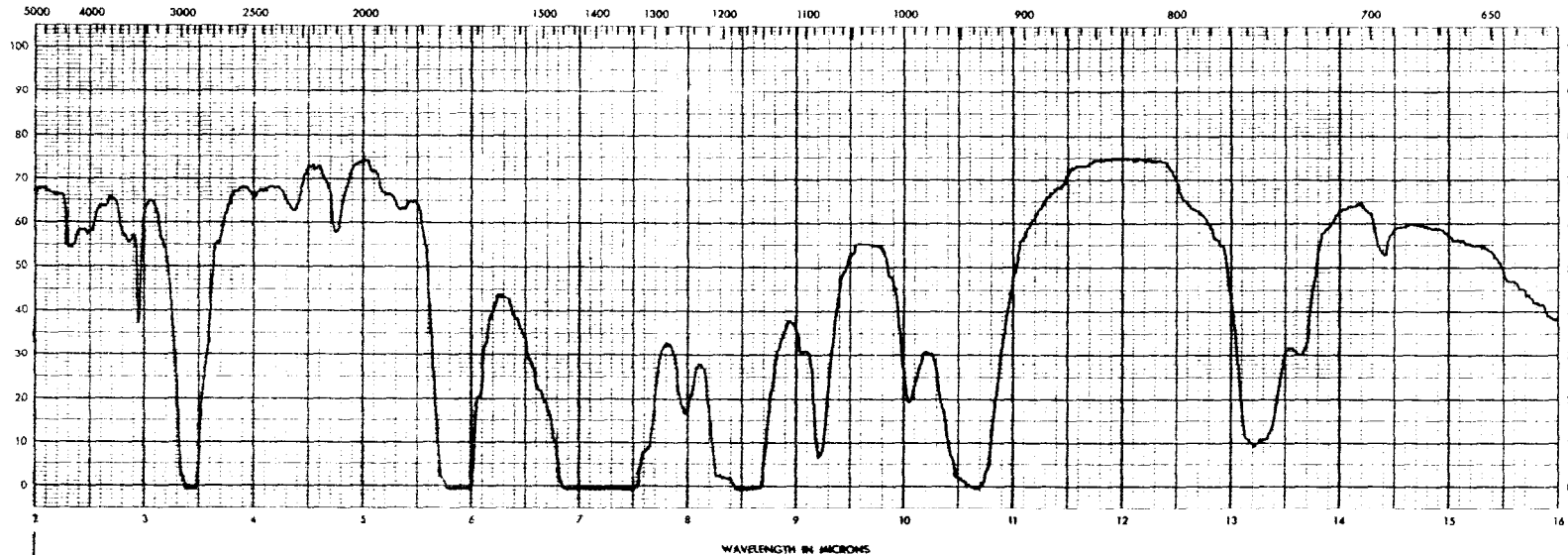
Beckman

INFRARED SPECTROGRAPH

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WHEN REORDERING SPECIFY CHART NO. 10970 BECKMAN INSTRUMENTS, INC., FULLERTON, CALIFORNIA, U.S.A.
WAVENUMBER CM⁻¹

46



GRAPH No

SPECTRUM NO. _____
DATE 2/23/69
SAMPLE PAINT
THINNER
SOURCE GROW CHEM CORP
STRUCTURE BATON ROUGE, LA
PATH _____
SOLVENT _____
CONCENTRATION _____
PHASE _____
COMMENTS BETWEEN
SODIUM CHLORIDE
WINDOWS
ANALYST JCF

Beckman

INFRARED

SPECTROPHOTOMETER