



E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
WILMINGTON, DELAWARE 19898

CHEMICALS, DYES AND PIGMENTS DEPARTMENT

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May 21, 1979

District Managers

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R. E. Rogers-CD&P-B-6248
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NEW KROLOR® RED, KR-981-D

KR-981-D, the newest addition to our Krolor® line, is now available for immediate shipment. We had restricted sales while we completed plant scale-up and accumulated inventory.

We have been successful in promoting Krolor® as a lower cost alternative to cadmium pigments where some compromise in heat stability can be tolerated. We have been least successful in the red shade range because our only previous Krolor® Red, KR-980-D, is among the least heat stable Krolor® products.

Krolor® Red, KR-981-D is one of the most heat stable Krolor® pigments and it should enjoy a much wider appeal. Also, its superior intensity in both masstone (full shade) and tints will give your customers greater formulating latitude than is available with any other heat resistant red. All this, and savings up to 60%, make this product a valuable addition to our line.

These and other advantages are described and exhibited in a limited number of sales aids. These are en route per the attached distribution and are designed to be used for discussions with customers. There are not enough to give to customers, but a one-page handout with vinyl color swatch is included.

About 80% of domestic Krolor® sales are to plastics accounts where you will find the bulk of cadmium red sales. Superior lightfastness, chemical resistance and heat stability are also important to segments of the coatings industry. However,

KR-981-D is treated to reduce dust like other low dust Kroloro products, and this treatment may not be compatible with coating vehicles.

The attached list of customers have already received samples. Of course, we would appreciate any customer feedback that you receive.

Personnel in our technical service group at Chestnut Run have considerable experience with this product. Please take advantage of their expertise.

KR-981-D was included in our March 13th price announcement to customers at \$7.75/#.

D. W. Hoppenjans
D. W. Hoppenjans

DWH:nvw

KROLORE RED KR-981-D

Samples

Cleveland

Office (2)
PMS, Norwalk, OH
Lancer Chemical, Akron, OH
Republic Chemical Corp., Akron, OH

Charlotte

Chicago

Office (17)
3M, St. Paul, MN
Morten Chemical Co., Chicago, IL
General Electric, Mt. Vernon, IN
Bee Chemical, Lansing, IL
Chroma Corp., McHenry Shores, IL
Uniroyal, Inc., Chicago, IL

Houston

Ethyl Corp., Baton Rouge, LA
American Thermoplastic, Houston, TX
USS Chemical Co., Baton Rouge, LA
Phillips Products Co., Inc., Houston, TX

New York

Poly Tex, NY, NY
Ampacet
Premoid, Springfield, MA
Pan Chemical, Hawthorne, MA
General Tire, Lawrence, MA
Reed Plastics, Holden, MA
Custom Color, Cumberland, RI
COZ Chemical, Northbridge, MA
Color Technology, Westborough, MA
Northern Petrochemical, Clinton, MA
Carl Gordon Assoc., Worster, MA

Wynnewood

Borg Warner, Parkersburg, WV

San Francisco

KROLOR® RED KR-981-D
SUGGESTED SALES AID DISTRIBUTION

	<u>For Circulation</u>	<u>To Individuals</u>	<u>Total</u>
Chicago	2	P. T. Hitchens	3
Cleveland	2	S. C. Brubaker D. E. Sherwood	4
Charlotte	2	D. B. Miley	3
Houston	2	T. B. Crittenden	3
New York	2	G. A. Black J. M. Loughney	4
San Francisco	2	D. R. Mears	3
Wynnewood	2	J. C. Nissen	3
DISA	4		4
DUFFE	2		2
DU PONT OF CANADA	1		1
DU PONT OF SOUTH AMERICA	1		1
Chestnut Run	2		2
	24	9	33

KROLOR® RED KR-981-D FOR PLASTICS

Krolor® Red KR-981-D is designed for the high temperature plastics markets – currently dominated by high cost cadmium reds. Heat stability in both masstone and tint is excellent as shown in Exhibits 1 and 2. And high intensity at both levels gives it greater formulating latitude than is available in any other heat resistant red. For example, KR-981-D can be used in blends with Krolor® Orange R, KO-906-D, to match any intermediate masstone shade of cadmium and provide even brighter tints, a well known limitation of cadmium reds (See Exhibits 3 and 4). In all cases, these are achievable at lower cost (See Tables I and II).

Besides value, brightness of shade, and heat stability, KR-981-D:

- Has excellent dispersibility.
- Has superior lightfastness, especially in tints where cadmium pigments are deficient.
- Is low dusting.

The brightness and heat stability of KR-981-D, in both masstone and tint, are superior to our original Krolor® Red, KR-980-D. The exhibits illustrate both of these points – especially in tint. However, KR-980-D can be used for its still lower cost in situations where its limitations present no problem, e.g., mostly in olefin applications.



KROLOR® RED KR-981-D EXHIBIT PREPARATION

Heat Stability (Exhibits 1 and 2)

Mass tone and tint heat stability of Krolor® Red KR-980-D, KR-981-D and a cadmium medium dark red toner are shown in ABS, a particularly demanding system. Concentrates of each pigment were prepared at 20% loadings in Cylcolac® TD-1000 resin on a 2-roll mill and reduced to final pigment levels in a Banbury in the same resin. These were molded at 450°, 500° and 550°F using a molding cycle which subjects the plastic to a five-minute dwell time at each temperature.

Color and Cost (Tables I and II and Exhibits 3 and 4)

Color and cost comparisons between a cadmium medium dark red toner and a matching blend of KR-981-D/KO-906-D, and cadmium light red toner and KO-906-D are shown in ABS. These chips were also prepared from 20% 2-roll mill color concentrates let-down to final pigment levels in a Banbury; they were molded at 450°F using the same procedure described for heat stability tests. All intermediate shades of cadmium red between the blue shade Cadmium Medium Dark Red and the yellow shade Cadmium Light Red can be approximated with blends of KR-981-D/KO-906-D.

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EXHIBIT 1

TIINT HEAT STABILITY
KR-981-D IN ABS
(0.2/2.0 phr - Color/TiO₂)

- Heat Stability - KR-981-D is comparable to cadmium pigments and is superior to KR-980-D in the range exhibited even in demanding resins such as ABS.*
- Intensity - Blue, intense shade expands shade matching opportunities, limited by dullness of cadmium reds.
- Value - KR-981-D offers substantial savings compared with cadmium reds.

*Five minute cycle time; under some conditions (higher temperature and/or longer times) KR-981-D will begin to fail before cadmium.

Cadmium Medium
Dark Red
450°F
500°F
550°F

Krolor® Red
KR-981-D
450°F
500°F
550°F

Krolor® Red
KR-980-D
450°F
500°F
550°F

EXHIBIT 2

MASSTONE HEAT STABILITY
KR-981-D IN ABS

(All Color @ 1 phr)

- Heat Stability — KR-981-D is excellent in masstone as well.
- Intensity — The brightness of KR-981-D is still evident in deep shades.
- Value Plus — KR-981-D also has excellent dispersibility, is low dusting, and has better lightfastness than cadmium pigments.

Cadmium Medium
Dark Red
450°F
500°F
550°F

#

Krolor® Red
KR-981-D
450°F
500°F
550°F
#

Krolor® Red
KR-980-D
450°F
500°F
550°F
#

BLANK

KROLOR® RED KR-981-D OFFERS YOU:

- Value
- Intense Shade
- Heat Stability
- Excellent Dispersibility
- Low Dusting Properties
- Lightfastness
- Color Matching Opportunities

Let's take a closer look at the color matching and value of KR-981-D.

1. The first part of the document is a letter from the President of the United States to the Congress, dated January 1, 1861. It is a very important document, as it sets out the President's policy for the new year. The letter is written in a very formal and dignified style, and it is full of references to the Constitution and the laws of the United States.

2. The second part of the document is a report from the Secretary of the Treasury, dated January 1, 1861. It is a very important document, as it sets out the Secretary's policy for the new year. The report is written in a very formal and dignified style, and it is full of references to the Constitution and the laws of the United States.

3. The third part of the document is a report from the Secretary of the Interior, dated January 1, 1861. It is a very important document, as it sets out the Secretary's policy for the new year. The report is written in a very formal and dignified style, and it is full of references to the Constitution and the laws of the United States.

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EXHIBIT 3

SHADE AND VALUE COMPARISON BLUE SHADE REDS

- Superior Intensity — Blends of Krolar® pigments in both masstone and tint are more intense greater shade marching latitude.
- Superior Value — Notice the cost savings in the blue-red portion of the spectrum.

TABLE I
COLOR AND COST COMPARISONS

Tint	Color Loading	Color ³	Pigment
	phr ¹		Cost ²
C.P. Cadmium Medium Dark Red	0.1	Control	1.19
KR-981-D/KO-906-D — 15/85	0.2	Intense, yellow	0.69
KR-981-D/KO-906-D — 15/85 (plus trace amount of black)	0.2	Slightly intense, very slightly yellow	0.69
Masstone			
C.P. Cadmium Medium Dark Red	1.0	Control	11.90
KR-981-D/KO-906-D — 66/34	1.5	Intense, slightly blue	9.04
KR-981-D/KO-906-D — 66/34 (plus trace amount of black)	1.5	Slightly dark, blue	9.04

¹Parts per hundred resin (loading adjusted to give equal masstone opacity and equal tint strength).

²Color only — based on \$11.90/lb. for cadmium medium dark red, \$7.21/lb. for cadmium light red, \$7.75/lb. for KR-981-D and \$2.70/lb. for KO-906-D.

³Read under Macbeth lamp, north daylight. Since these matches are metamerics, they will differ under a variety of light sources.

EXHIBITS 3 and 4 COLOR MATCHING

The intensity of the Krolor[®] KR-981-D/KO-906-D pigment blends can be used to approximate all shades between the blue shade cadmium medium dark red and the yellow shade cadmium light red at lower cost.

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EXHIBIT 4

SHADE AND VALUE COMPARISON
YELLOW SHADE REDS

- Match for Yellow-Reds Too
- Considerable Cost Savings

TABLE II
COLOR AND COST COMPARISONS

Tint	Color Loading phr ¹	Color ³	Pigment Cost ²	Savings
C.P. Cadmium Light Red KO-906-D	0.1 0.2	Control Blue, slightly intense	0.72 0.54	25%
Masstone C.P. Cadmium Light Red KO-906-D	1.0 1.5	Control Intense	7.21 4.05	44%

¹Parts per hundred resin (loading adjusted to give equal masstone opacity and equal tint strength).

²Color only — based on \$11.90/lb. for cadmium medium dark red, \$7.21/lb. for cadmium light red, \$7.75/lb. for KR-981-D and \$2.70/lb. for KO-906-D.

³Read under Macbeth lamp, north daylight. Since these matches are metameric, they will differ under a variety of light sources.