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CHEMICAL SPECIALTIES DATA REPORT

The information in this report was compiled to assist you in your evaluation and development of special uses for Monsanto products. Every effort has been made to include pertinent material bearing on the subject. This information is intended to guide your development work, but Monsanto cannot take part in the specific formulation or evaluation of any finished product... since knowledge of such should be reserved to yourself and is often your most valuable trade secret.

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MONSANTO DYTROL* FOR PRESERVING PAINT BRUSHES

DYTROL is Monsanto's trade mark for a non-volatile, non-flammable, pleasant-smelling liquid that possesses a strong softening action on paint and varnish resins. This report covers its use as a simple means of preserving paint brushes. DYTROL keeps brushes soft, pliable and usable indefinitely without tiresome cleaning.

Monsanto patents cover DYTROL and its use as a paint, varnish and lacquer film remover. Purchasers of this Monsanto product have the free right to use it for this purpose.

THE NEED FOR A SIMPLE METHOD OF PRESERVING USED PAINT BRUSHES

Until now, maintenance of paint brushes used in oil-based paints to keep them in good condition until the next use has been a tedious and time-consuming job. Amateur painters do not usually wish to spend the time needed for proper care and consequently end up with stiff, hardened and unusable brushes. Professional painters spend as much as 30 minutes at the end of the day treating their freshly-used brushes to protect their service life. This amounts to as much as 7% labor loss on painting contracts where this time could be spent "on the job."

The established procedure for brush care is of concern to both the brush manufacturer and the paint producer. Amateur painters tend to buy cheap brushes and they "put off" painting because each job requires a new brush. It is estimated that 65 to 70% of all paint brushes purchased by amateurs end up unusable after the first use. According to E. Norman Kagan Company, New York, management consultants, amateurs buy 70% of all paint (only 40% in 1948).**

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* DYTROL: Monsanto Trade Mark
** CHEMICAL WEEK, Page 70, September 6, 1958.

DYTROL provides a simple answer to the tedious task of washing, dipping in solvents, brushing out, rewashing, reworking, and the numerous steps usually needed to preserve paint brushes so they will be usable again in the future.

WHY DYTROL IS THE IDEAL AGENT TO USE FOR PRESERVING PAINT BRUSHES AND REMOVING PAINT FROM SKIN

* DYTROL will not evaporate; lasts indefinitely.
* DYTROL is non-flammable; no fire hazard with its use.
* DYTROL is completely safe to the skin. It is non-toxic and repeated contact with the skin will not cause either irritation or sensitization.
* No irritating vapors; only a pleasant, sweet-smelling aroma with DYTROL.
* One simple operation; less then five minutes to prepare used paint brush for permanent preservation.
* DYTROL does not harm the bristles or binding of brushes.
* DYTROL efficiently removes paint from the skin; imparts a cosmetic, pleasant "feel" to skin.
* Eliminates multiple step care and treatment of brushes with irritating solvents.
* Allows day-to-day or week-to-week painting on one job without time-consuming stops and delays for brush care.
* DYTROL protects investment in expensive brushes.
* Safe for nylon or animal bristle brushes.

HOW DYTROL SIMPLIFIES BRUSH CARE

A new method of brush care with DYTROL has been successfully demonstrated by commercial painters and amateurs alike. The procedure is simple; squeeze or wipe the brush dry of the excess of any oil-base paint; stand it in DYTROL for a few minutes; wrap it in paper and put it on the shelf. As long as a year later, the brush is soft and pliable and ready to use.

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If desired, brushes can be left standing in DYTROL until they are needed. If the working head is left submerged in DYTROL, the brush should be supported (by a wire which is inserted through a hole drilled in the brush handle resting across the top of the container) since the working head tends to crimp if the brush is allowed to stand on its bristles.

It is safe to leave DYTROL exposed in an open container with brushes immersed since DYTROL is completely non-toxic, non-flammable and DYTROL will not evaporate.

HOW DYTROL WORKS IN PRESERVING PAINT BRUSHES

The "preservative-softener" action of DYTROL is simple: it merely softens the paint to such an extent that it never hardens. For brush care and personal clean-up, DYTROL is outstanding. DYTROL is so non-volatile that it will not evaporate away. Consequently, DYTROL does not leave a hardened film-forming paint resin behind (the reason petroleum and volatile solvents are unsatisfactory for this method of cleaning.)

Small amounts of DYTROL will blend right into new paint without harming or affecting paint properties. A "soaked" brush, however, should have the excess DYTROL squeezed out before reuse. The simple procedure is as follows:

1. Squeeze out excess DYTROL.

2. Next, brush out the excess DYTROL on a scrap surface.

3. Dip brush into the paint and thoroughly brush out the first paint dipping on a scrap surface. If paint is of different color, repeat the dipping and brushing-out operation twice.

Any small amount of DYTROL now left in the brush goes into most paints without any noticeable effect. However, trace portions of DYTROL or paint softened with DYTROL adhering to bristles may be removed, if necessary, by the emulsifying action of soapy water or detergent. A final water rinse and drying gives a like-new brush. This method can also be used to provide a dry brush (for storage) if desired.

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TWO SPECIALTY MARKETS FOR DYTROL

Brush Preservers

DYTROL can be purchased in 55-gallon drums or 1000-gallon minimum tank wagons (where feasible) and "packaged" in various size containers when it is to be merchandised as a brush preservative.

Professional painters tend to use larger size containers and brushes. For this market, one-gallon size containers of DYTROL appear warranted. The container or package should allow at least a 4-inch brush to fit through the opening. Amateurs tend to buy smaller brushes and for this market, quart or pint size containers of DYTROL would be more acceptable.

An intriguing container possibility is the use of an oval and/or oblong can. A special cardboard or plastic "sleeve" can be devised that would simply fit into oval openings and support the brush at the bristle binding. In this manner, the bristles would not touch the bottom of the container. It is easy to devise other simple devices for allowing storage of the brush supported "in the can."

A special cardboard cannister with an insert made of DuPont Mylar polyester film is available* for packaging DYTROL. To use, the consumer merely pulls the string and cuts the top of the heat-sealed lining made of Mylar. The DYTROL can be stored and used in this package indefinitely. Further information on these DYTROL-tested containers is available.

Hand Cleaner

Specialty makers should find DYTROL valuable for hand cleaners. DYTROL can be used without modification or small amounts of coloring matter or perfumes can be added to give a special aroma. These mild, liquid cleaners can become popular for general personnel "clean-up" after messy painting jobs. The pleasant odor of DYTROL, its cosmetic "feel" and lack of harshness ideally recommend it for this use.

DYTROL can also be used as an additive or replacement for kerosene or other petroleum solvents in formulating waterless hand cleaners of the creme or emulsion type.

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* Name of Manufacturer upon request.

DYTROL OFFERS SPECIAL BENEFITS TO AMATEURS AND PROFESSIONAL PAINTERS

Restoring Stiff Brushes

DYTROL as a "preservative-softener" is valuable for restoring the pliability of stiffened brushes. Old hardened brushes can be suspended (in order to avoid crimping the bristles) in DYTROL. After a few days, the softened paint residues may be brushed out. Another dip into DYTROL usually restores the brush to its original soft, pliable condition.

Time Saving

DYTROL has important time-saving benefits for professional paint contractors. Its use eliminates the often tedious "end-of-the-day" clean up. Normally, a paint crew goes through a time-consuming (up to 30 minutes) procedure of cleaning brushes with thinner, working out the color, rethinning, rebrushing, etc. This involves the use of flammable, irritating, volatile and toxic solvents. Often when painters are using colors that are hard to work out (e.g., dark green or black), brushes are allowed to set overnight in the paint. This results in paint being caught in the heel of the brush with resultant difficulties the next painting day. Professional painters are highly receptive to the brush-preserving technique utilizing DYTROL: simply dip the brush into DYTROL and leave lying flat overnight or wrap in ordinary newspaper for longer storage before reuse in the same color. This operation takes only one to three minutes. The next time the brush is used in the same color, they brush out excess DYTROL, brush out one paint dip on scrap and start right in.

Pleasant Odor

Professional painters like the pleasant odor of DYTROL and its soft, soothing action on the skin. This is in sharp contrast to ordinary irritating paint solvents that remove basic skin oils. In contrast, DYTROL has a cosmetic action on the skin and leaves it soft and smooth.

Professional painters (as well as amateurs) find it most pleasant to use DYTROL to clean hands and skin after painting. DYTROL is outstanding by itself or for incorporation into waterless hand cleaners for use in paint shops. For personal cleaning up with DYTROL, painters can avoid the irritating, smarting and eye-burning effects associated with petroleum thinners and solvents.

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DYTROL IS SAFE IN EVERY WAY

DYTROL may be left in an open container since it is non-toxic, non-flammable and won't evaporate. DYTROL does not harm brush bristles. Tests were made on brushes with ordinary pig bristles bound in rubber or leather and metal covered, and nylon bristle brushes.

In actual use, DYTROL should not be allowed to stand in contact with varnished wooden handles of paint brushes for appreciable periods of time. Prolonged contact (2 days or more) with DYTROL will blister the varnish on the handle finish.

DYTROL ACTUALLY LOWERS PAINTING CONTRACTORS' COST

One commercial painting contractor figured that for an 8-hour day, 30 to 35 minutes was required for clean-up and preparation of brushes used in oil paints. When he switched to the use of DYTROL, the clean-up period for his painters averaged 5 minutes. In this way, he was able to increase his "on the job" time approximately 7%; hence, lowered operating costs.

EXPERIMENTAL TESTS

* To demonstrated DYTROL's ability to soften aged and hardened paint brushes, the following experiments were performed:

Paint brushes (pure pig bristles set in vulcanized rubber) were saturated with the following paint formulae and allowed to harden by aging.

Formula #1: "Black Enamel"

Pigment	Carbon black
Vehicle	Oils and resins Volatile thinner

Formula #2: "White Paint"

Pigment (52.6%)	
Cryptone	82.0%
TiO_2	3.6%
Talc	14.4%
Vehicle (47.4%)	
Varnish	85.0%
Drier and thinner	15.0%

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Formula #3: "Blue Enamel"

Pigment (42%)

Sublimed lead	90%
TiO_2	10%

Vehicle (58%) - tinted with Ultramarine Blue

Linseed Oil	19.5%
Tung Oil	17.4%
Resins	12.8%
Japan Drier	4.6%
Mineral Spirits	41.5%
Turpentine	4.2%

These brushes were thoroughly soaked in the various paint formulae and then allowed to harden (aging in open air). They were then placed in DYTROL with the following results:

Brush Number	Paint Formula	Saturated Brush Aged For	Remarks
1	1	2 months	Brush was softened in 18 hours, washed clean with soapy water, air dried and reused as 1A. 1A was first used to paint a metal surface satisfactorily with Paint Formula #2, then used as 1A.
1A	2	2 months	Brush was softened and ready for washing with soapy water in 2.5 hours.
2	2	1 week	Brush was softened and ready for washing with soapy water in 2.5 hours.

* To demonstrate the ability of DYTROL to prevent setting of used paint brushes the following experiments were performed:

Paint brushes (pure pig bristles set in rubber or leather) were used for routine painting with the tabulated paints below. At the end of the painting, each brush was simply given one dip into DYTROL -- (the brushes were not worked back and forth, but merely quick dipped.) The brushes were then allowed to lie flat on a non-porous surface (with exposure to the open air). The time required for the brush to set is tabulated below:

Paint Type	Time To Set
Synthetic Outside Trim Enamels	Slight set after one month; Not fully set after 4 months.
Varnish	Set after 5 weeks
Interior Flat Wall Paint	Started to set after 3 weeks
Interior Enamel	Started to set after 4 days
Exterior Oil Color	Started to set after 3 weeks
Exterior Marine Spar Enamel	Started to set after 2-1/2 weeks

TYPICAL USE TESTS

* To demonstrate the compatibility of small amounts of DYTROL blended into paint, a 2-1/2 inch pig bristle brush (as in previous examples) was used for routine application of interior enamel. At the end of the work day, the brush was quick-dipped into DYTROL and allowed to lie flat on a non-porous surface in open air during the weekend. On Monday morning, the brush was brushed out on a scrap surface to remove as much DYTROL as possible. The brush was then dipped into a 4-quart container of enamel and used for the day's painting. No adverse effects were noted in either the paint or the painted surface. (It is recommended, however, that a brush soaked with DYTROL be brushed-out with paint at least once on a scrap surface before resumption of painting.)

* To demonstrate the resistance of nylon bristles to DYTROL, a nylon brush was allowed to soak in DYTROL for a week. No softening or deteriorating effect on the bristles was noticed at the end of this time.

However, precaution should be taken not to allow a brush handle to remain in DYTROL since the varnished handle tends to blister after 2 or 3 days.

* Several old stiffened brushes which had not been completely cleaned of paint resin were soaked in DYTROL for a week. At the end of this time, the brushes were completely softened. However, this method was not satisfactory for stiffened brushes that contained dry pigment only.

SUGGESTED PROCEDURES FOR PAINT BRUSH CARE WITH DYTROL

To use with same color paint:

a) Dip the brush into DYTROL, wrap in paper and store in flat position. When ready to use again, merely brush off excess DYTROL, dip into the paint, brush out again and start to paint.

-- or --

b) Suspend the brush in DYTROL up to the bristle binding, taking care not to crimp bristles by allowing the bottom of brush to rest on can bottom. When ready to use again, brush out excess DYTROL, dip into the paint, brush out again and start to paint.

To use with different color paint:

a) Remove excess color by dipping into paint thinner; one dip into DYTROL; wrap in paper and store flat.

-- or --

b) Remove excess color by dipping into paint thinner; suspend the brush in DYTROL up to the bristle binding, taking care not to crimp bristles by allowing bottom of brush to rest on can bottom. When ready to use again, brush out excess DYTROL, dip into the paint, brush out again and start to paint.

DYTROL treatment will also help soften an improperly-washed brush. For example, painters will wash a brush in turpentine instead of paint thinner. This treatment allows resins to harden in the bristles. This can be overcome by a DYTROL soaking of the hardened brush prior to usage.

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PHYSICAL PROPERTIES OF DYTROL

Solubility in Water .....less than .003% at 27°C.

Crystallizing Point .....fluid at -30°C.

Boiling Point .....approximately 375°C.

Vapor Pressure .....1.1 mm. mercury at 160°C.

Density .....approximately 9 lb./gal.

Flash Point .....435°F.

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