Woodfinisher's Pride: An Alternative to Current Chemical Paint Strippers

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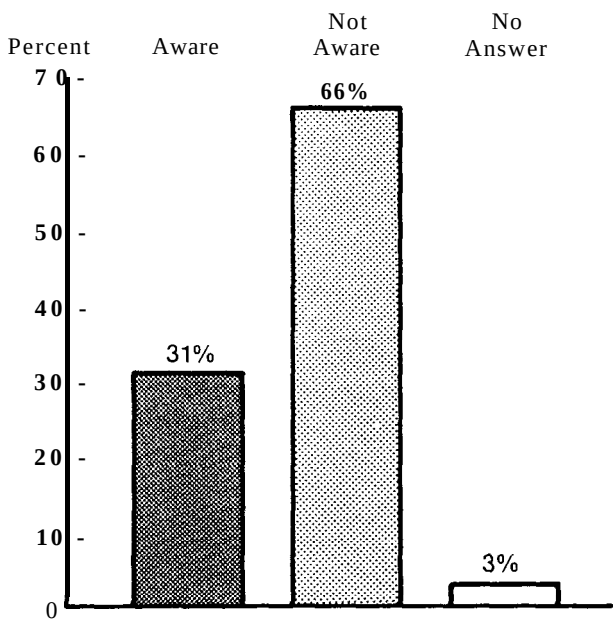
Current Technology and Environmental Concerns

During the last five years, methylene chloride, the active ingredient that has been used in chemical paint strippers since the 1970s. has come under increasing scrutiny for its potential to damage human health and the environment. Methylene chloride has been shown to be an extremely toxic chemical, and emissions and wastes resulting from its use must be disposed of under EPA's hazardous waste guidelines. Furthermore, it has been linked to the development of cancer in animals, although its effect as a carcinogen on humans has not been proven.

Environment is becoming a consumer issue. Effective products are no longer enough. Surveys suggest that consumers will pay more for products that do not pose health and environmental risks (see Tables 1. 2, and 3 and Fig. 1 for results of consumer surveys). These issues have led manufacturers to search for alternative methods of stripping paint.

Many of the products that have been formulated to meet these needs have been marketed without being thoroughly tested and evaluated. Although some of these preparations do seem safer, performance is markedly inferior to standard removers. In fact, it is rare to find a product that *is* both *safe and effective,* and in some cases, alternatives contain chemicals that are equally as hazardous as methylene chloride.



Source: National Tracking Study, 1990, Creative Technologies Group, Inc.

Figure 1.-Methylene chloride awareness (n=334).

Woodfinisher's Pride: A True Alternative

Woodfinisher's Pride is an alternative to methylene chloride paint strippers that is both safe and effective (see Tables 4 and 5 for summaries of Woodfinisher's Pride's performance and toxicity attributes). Its qualities make it an excellent health and environmental choice-it can be used indoors

Table 1.-Characteristics of survey respondents. (n = 334)

AGE	PERCENT
18-24	10
25-34	32
35-44	30
45-64	15
55-64	13
Median Age =	37.0

SEX	PERCENT
Male	54
Female	46

INCOME	PERCENT
< $15M	4
< $25M	12
< $40M	34
< $50M	18
< $60M	8
< + $60M	10
No answer	14
Median income	$36,800

Source: National Tracking Study, 1990, Creative Technologies Group, Inc.

Table 2.-Opinion of methylene chloride among aware respondents.

OPINION	PERCENT
Dangerous	64
Not environmentally safe	27
Carcinogen	18
Smell	14
Fumes	9

Source: National Tracking Study, 1990, Creative Technologies Group. Inc.

with adequate ventilation, has low toxicity, is nonflammable and biodegradable, and cleans up with soap and water. The active ingredient in the product, N-methyl pyrrolidone (NMP), has been used industrially for over 25 years, and thus has over a quarter century of testing and usage to substantiate claims (see Fig. 2).

The product was not previously brought to the consumer market because it Is relatively expensive and early formulations performed poorly. Now, the Creative Technologies Group, Inc., has successfully developed a formula for consumer use at a competitive price and created an effective market strategy for the product.

Product Formulations	Biodegradable
Product Formulations Removed Coatings/ Finishes	Mixture assumes the disposal status of the particular coating (EPA TCLP Procedure)
Product Packages	Polyethylene + nylon (recyclable)
Reuse of Packages	User receives $1.00 for each container returned for reuse/ recycling

Source: Creative Technologies, Inc.

Figure 2.- Woodfinisher's Prideenvironmental attributes.

Woodfinisher's Pride is a paint and varnish stripping gel. The product is suitable for wood. glass, and metal, and can remove lacquer, acrylic, polyurethane, alkyd enamel, shellac, latex. varnish, and epoxy. Because traditional methylene chloride strippers evaporate twice as fast as Woodfinisher's Pride (and require 'patchwork applications"), Woodfinisher's Pride is actually 27 percent less expensive to use than the other products. In most cases, it removes multiple layers of coatings in 30 minutes with no reapplication (see Table 6 for a cost comparison of Woodfinisher's Pride with traditional strippers). With a rate of evaporation 360 times slower than methylene chloride, the product stays wet for hours, thus extending flexibility of use. It does not leave a waxy residue, as do many strippers, and will not raise wood grain or lift veneers because it does not contain any water.

Primary Ingredients

Woodfinisher's Pride for paint works by swelling the polymer bonding paint to the substrate, caus-

Table 3.- Unmet paint stripping consumer needs (n = 334).

	IDEAL PRODUCT	CURRENT PRODUCT	DIFFERENCE (GREATEST PRODUCT OPPORTUNITIES)
Safer around children	8.57	5.71	2.86
Nontoxic	8.61	6.21	2.40
Biodegradable/environmentally safe	8.72	6.54	2.18
Easily removable from curves or corners	8.58	6.61	1.97
Nonpoisonous	8.61	6.67	1.94

Source: National Tracking Study, 1990, Creative Technologies Group, Inc.
Key: 10 = Extremely Important
1 = Not at All Important

Table 4.-Attributes of Woodfinisher's Pride.

FACTORS	ATTRIBUTES
Stripping gels	
Paint	NMP + Activators
Varnish	NMP/BLO + Activators
Consumer paint and varnish removal	Replace Traditional Strippers
Substrates	Same
Time	30 minutes or less
Application	No special tools Steel wool/metal scrapers
Hazards	Eye/skin irritant Flash point = 194F
Advantages	Biodegradable Not flammable No offensive fumes One-step application Soap and water cleanup Personal safety
Disadvantages	15-20% more expensive unit price (less expensive for total job)

Source: Creative Technologies Group, Inc.

ing the coat to break and lift from the surface. The product for varnish breaks the carbon-nitrogen-oxygen/urethane bond, causing the varnish to separate from the surface.

Woodfinisher's Pride contains three primary ingredients: NMP (N-methyl pyrrolidone) is a water-soluble, biodegradable solvent; it has low toxicity, is nonflammable and noncarcinogenic. and has been approved by EPA for preharvest usage (see Table 7 for N-methyl pyrrolidone test results]. Gamma-Butyrolactone. a second active ingredient, is also water soluble and biodegradable, and has been cleared by the Food and Drug Administration for use in multipurpose food flavorings as defined by the Food Extract Manufacturers Association. The International Agency for Research on Cancer concluded that Gamma-Butyrolactone is noncarcinogenic in rats and mice. The third ingredient, Bitrex. is a nontoxic bittering agent designed to prevent accidental ingestion by children.

Table 5.-Woodfinisher's Pride paint and varnish formulas' irritation and toxicity test results.

TESTS	VARNISH FORMULA	PAINT FORMULA
Acute oral toxicity: (LD-50 TEST)	1.5-5.0 g/kg	5.11 g/kg
Primary skin irritation test (applied to abraded and intact sites, then occluded and examined)	PII = 1.29 (slightly irritating)	PII = 1.54 (mildly irritating)
Primary eye irritation test (average ocular irritation scores)		
UNWASHED EYES: 1 hour	28.5	43.7
4 days	43.0	81.O
14 days	3.6 (severe irritant)	66.0 (extremely irritating)

Source: Creative Technologies Group, Inc.

Table 6.-Cost-per-use comparison of Woodfinisher's Pride vs. traditional strippers.

COST	TRADITIONAL STRIPPERS	WOODFINISHER'S PRIDE	WOODFINISHER'S PRIDE % DIFFERENCE
Average Retail Price: 32 ounces	$5.99	$8.50	+ 42%
Per ounce	.187	,266	+ 42%
Ounces Required per Square Foot	0.98	0.50	- 49%
Cost per Square Foot	$0.183	$0.133	- 27%
Total Difference			- 27%

Source: Creative Technologies Group, Inc.

Note: Calculations based on the following lab data:

Ounces required determined by ability to remove three coats of paint or varnish to bare wood, and considers any reapplication required due to evaporation of product from surface.

Actual ***data:***

	Paint	Varnish	Average
Methylene Chloride Products:			
Cost per ounce	$0.187	$0.187	$0.187
Ounces needed per square foot	1.07	0.89	0.98
Cost per Square Foot	,200	.166	0.183
Woodfinisher's Pride:			
Cost per ounce	$0.266	$0.266	$0.266
Ounces needed per square foot	0.672	0.329	0.49
Cost per Square Foot	,179	.088	0.133

Table 7.--N-methyl pyrrolidone, (primary ingredient in Woodfinisher's Pride) irritation and toxicity tests results.

TESTS	RESULTS
Acute oral toxicity (LD-50 on a variety of species)	Low order of toxicity
Subacute feeding studies (Wistar rats, Charles River mice, beagle dogs, game birds)	Low order of toxicity
Skin irritation/chronic dermal toxicity (rabbits, humans, guinea pigs)	Skin irritant
Ocular toxicity	Eye irritant
Inhalation hazard testing (cats, rabbits, guinea pigs, rats, mice)	No effect (even at saturation)
Injection toxicity	Low
Carcinogenicity/mutagenicity studies (Ames Test, Mouse Lymphoma Assay, CHO Forward Mutation Assay, Unscheduled DNA Synthesis Assay)	Inactive
(2-year inhalation study)	No activity
Embryotoxicity/teratology studies	Not teratogenic/embryotoxic at high levels (1g/kg)
Toxicity to aqueous organisms	Low
Pharmacokinetics	Rapidly excreted
Biodegradation	Highly biodegradable
Regulatory approval EPA preharvest approval EPA postharvest approval FDA slimicides-indirect food additive	Jan. 1985 (40 CFR 180-1001 (D) Pending Approved (21 CFR 176.300) GRAS

Source: Creative Technologies Group, Inc.

Comparison with Other Products

Mefhylene Chloride Strippers

Woodfinisher's Pride does not contain methylene chloride or other flammable or toxic chemicals: as a result, the fumes are not dangerous when inhaled, and it does not require extreme ventilation. Also, Woodfinisher's Pride does not evaporate quickly, so pieces do not have to be stripped in sections (see Figs. 3, 4, and 5 for comparison of Woodfinisher's Pride with traditional methylene chloride strippers).

Nonmefhylene Chloride Strippers

With the exception of products containing dibasic esters, strippers presently being used as a substitute for methylene chloride products contain other harmful and flammable ingredients such as methanol, toluene, and acetone. Dibasic ester products such as 3M's Safest Stripper are difficult to apply, require several hours for the product to work, and contain a high percentage of water, which is damaging to wood substrates.

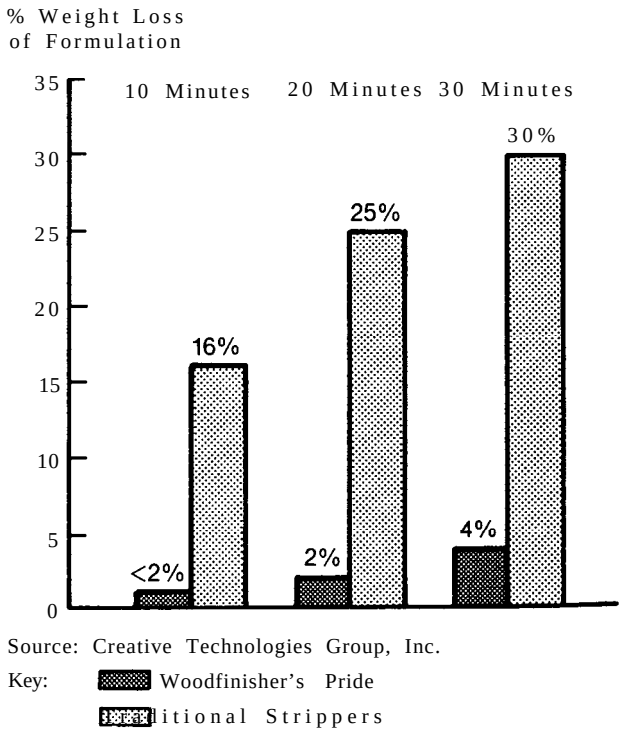


Figure 3.-Formulation volatility comparison of **Woodfinisher's Pride vs. traditional strippers.**

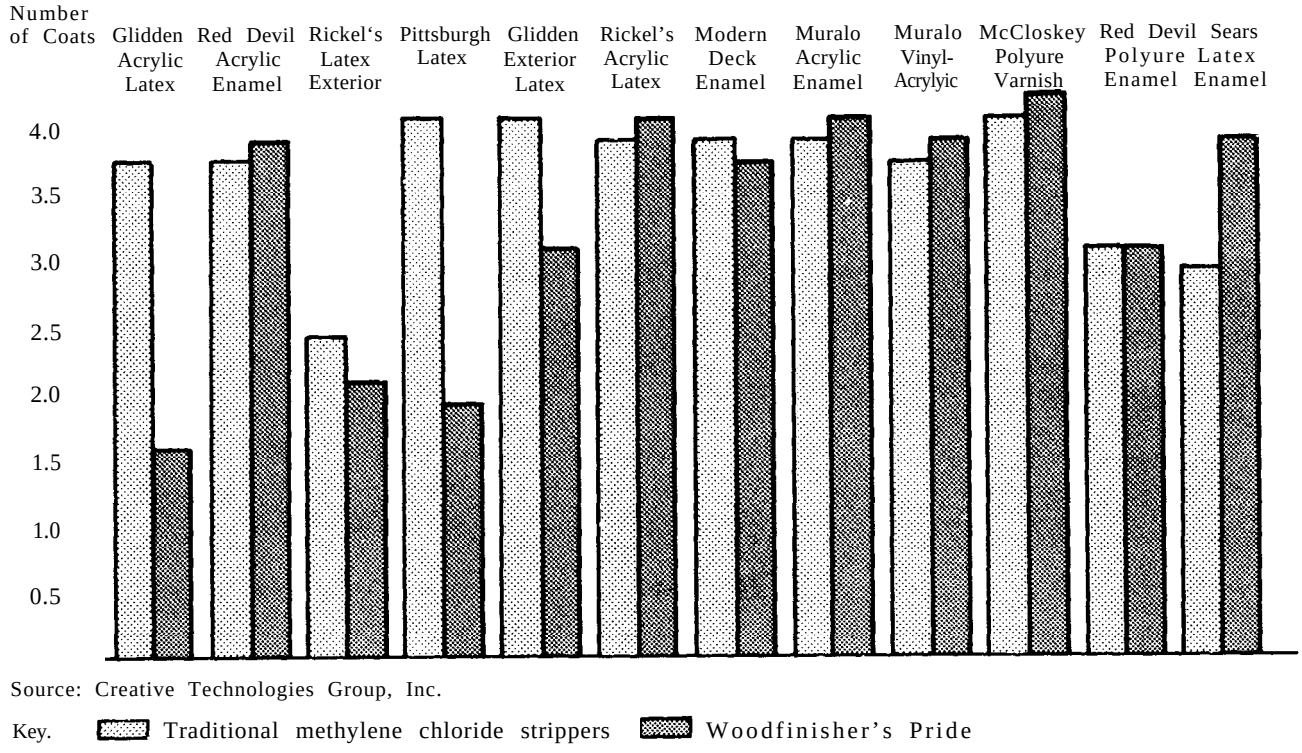


Figure 4.-Performance of Woodfinisher's Pride vs. traditional methylene chloride strippers after elapsed time of 15 minutes.

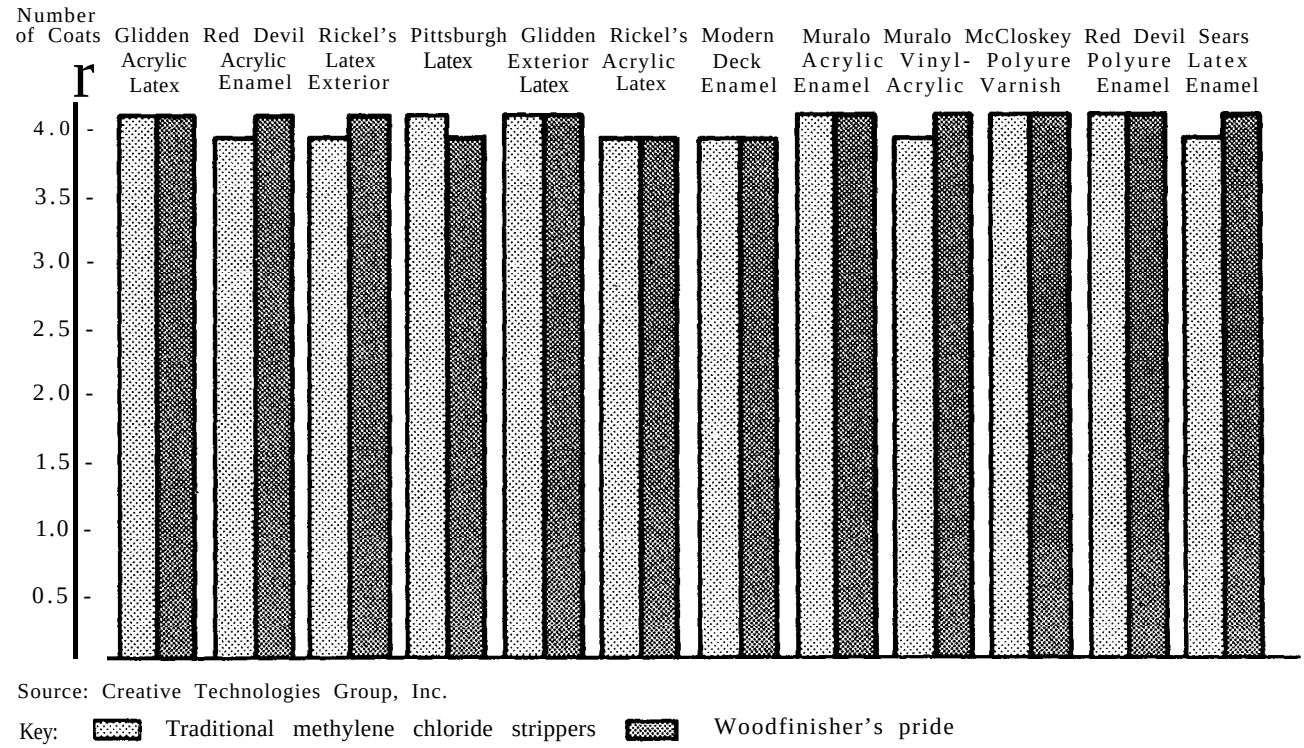


Figure S.-Performance of Woodfinisher's Pride vs. traditional methylene chloride strippers after elapsed tlme of 30 minutes.

Conclusion

Woodfinisher's Pride is a high-performance product that is safer for the environment and the user than methylene chloride preparations. While the health consequences of methylene chloride are still being debated, Woodfinisher's Pride is an alternative that can provide excellent results and generate good profits for retailers. Tables 8 and 9 compare response to Woodfinisher's Pride and a leading methylene chloride brand.

Table 8.-Consumer study of Woodfinisher's Pride vs. Formby'sEtrypeeze for stripping surfaces (N = 55, side-by-side use).

ATTRIBUTE	WOODFINISHER'S PRIDE	METHYLENE CHLORIDE
Able to coat entire surface.	7.73 *	6.50
Able to use inside	8.94*	6.27
Biodegradable/safer to use	8.80 *	4.68
Able to clean up with water	8.50	5.57
Right consistency for vertical surfaces	8.48	5.64
Able to reuse applicator brush	8.42 *	5.73
Easy to use	8.24 *	6.47
Having a pleasant scent	8.06 *	4.91
Easy removal from surfaces	7.80 *	6.22
Safer around children	7.35 *	4.70
Easy removal from curves/corners	7.07	5.29
Easy removal of several layers	6.89	5.22
Overall Attribute Evaluation:	7.73	6.50
Overall Preference:	71%	27%

Source: Consumer Usage Study. Creative Technologies Group, Inc.
Note: Paints tested were enamel, polyurethane, alkyd, latex. and acrylic.
* = Statistically significant at the 95% confidence level.
Key: 10 = Most satisfied
1 = Least satisfied

Table O.-Consumer Study of Woodfinisher's Pride vs. Formby's/Strypeeze for stripping varnished surfaces (N = 157, side-by-side use).

ATTRIBUTE:	% PREFERRING WOODFINISHER'S PRIDE	% PREFERRING METHYLENE CHLORIDE
Biodegradable/safer for environment	94	4
Able to clean tools with soap/water	93	1
Easy to clean up	92	6
Having a pleasant scent	90	3
Able to use inside	89	8
Right consistency for vertical	87	13
Able to coat entire surface at once	86	13
Easy to use	83	11
Safer around children	83	11
A good value for the money	72	21
Removing coatings easily	65	28
Taking less time to do project	59	38
Able to remove several layers of varnish	58	39
Overall Preference	62%	31%

Source: Consumer Usage Study, MARKETING SPECTRUM.
Note: Varnishes tested were polyurethane and shellac.