

EVALUATION OF FORM RELEASE AGENTS
USED WITH LATEX MODIFIED CONCRETE

Report 71-4

August 1971

VERMONT DEPARTMENT OF HIGHWAYS

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Report Prepared By

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OBJECTIVE:

Laboratory tests indicate that it takes up to ten times as much force to remove untreated wooden forms from a latex modified concrete than would be required to remove the same form work from a normal concrete. The objective of this experiment was to determine which of the available form release agents is the most effective when forms are to be stripped from a latex modified concrete.

TEST PROCEDURE:

Four test series were performed in the laboratory under uniform temperature and humidity conditions. Each test series consisted of ten pieces of exterior plywood measuring 12" X 12" X 5/8" with a 4" high section of 10" diameter sonatube used to contain the concrete sample in the middle of each test panel.

The quantity of form oil applied by brush within each 10" diameter circle was based on the manufacturer's suggested maximum application rate for medium density plywood. The application rates varied between products with coverages ranging from 1.8 grams (1000 sq. ft./gal.) to 9.34 grams (200 sq. ft./gal.) for the 0.54 sq. ft. test areas. One untreated test panel was included in each test series to serve as a reference sample.

The concrete was mixed in a Lancaster mixer using a crushed granite aggregate and Dow Chemical Company's SM 100 latex admixture. No air entraining agents were used and equal amounts of water were added to each mix in an attempt to obtain equal slumps.

When the test molds were filled with concrete, a 3/8" eyebolt was positioned in the center of each specimen so that a Tinius-Olsen testing machine could be used to pull the concrete cylinder from the test panel.

Initial set of the concrete occurred within one hour of mixing, and all test specimens were pulled at the end of a five-day period.

EVALUATION OF FORM RELEASE AGENTS USED WITH LATEX MODIFIED CONCRETE

PRODUCT	COVERAGE (SQ. FT.) /GAL.	SLUMP (IN.)	AIR (%)	PULL (LBS.)	AVE PULL (LBS.)	REFERENCE SAMPLE (LBS.)
Reference	No release agent	3½	3½	910		
	No release agent	4	3½	952	778	
	No release agent	6½	4	726		
	No release agent	6	7½	525		
Magic-Kote	1000	4	3½	105		
Concentrate	1000	4	3½	98	113	952
	1000	4	3½	136		
Texaco						
Code #1590	600	6½	4	173		
	600	6½	4	149	142	726
	600	6½	4	105		
Magic-Kote	1000	6	7½	115		
Form Coating	1000	6	7½	183	147	525
	1000	6	7½	144		
Duogard	600	6½	4	207		
	600	6½	4	153	210	726
	600	6½	4	268		
Duogard	600	6	7½	195		
	600	6	7½	249	222	525
	600	6	7½	222		
Noxcrete	1000	6½	4	265		
	1000	6½	4	160	231	726
	1000	6½	4	269		
Form Film	200	4	3½	284		
	200	4	3½	234	248	952
	200	4	3½	225		
Swift #833						
Parting Compound	600	3¼	3½	247		
	600	3¼	3½	258	263	910
	600	3¼	3½	283		
Allenform	600	3¼	3½	265		
	600	3¼	3½	220	273	910
	600	3¼	3½	335		
Noxcrete	1000	6	7½	287		
	1000	6	7½	282	281	525
	1000	6	7½	275		
Form Shield	600	4	3½	268		
	600	4	3½	305	298	952
	600	4	3½	319		
Swift #842	1000	3¼	3½	219		
Parting Compound	1000	3¼	3½	366	304	910
	1000	3¼	3½	328		

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PRODUCT	MANUFACTURER	COVERAGE (SQ FT/GAL)	COST PER GAL.	COST PER SQ. YD.	REMARKS
Magic-Kote (Concentrate)	Symons Mfg. Co. 200 East Touhy Ave. Des Plaines, Ill. 60018	1,000	85-95¢	\$.008	
Texaco Code #1590	Division Office 830 Boylston St. Brookline, Mass. 02146	600	98¢	\$.014	Can be cutback with diesel fuel or kerosene for economy
Magic-Kote	Symons Mfg. Co. 200 East Touhy Ave. Des Plaines, Ill. 60018	1,000	85-95¢	\$.008	
Sealtite "Duogard"	W. R. Meadows, Inc. 2 Kimball St. Elgin, Ill. 60120	600	\$1.00	\$.015	
Nox Crete	The Nox-Crete Co. 20th & Williams St. Omaha, Nebraska 68108	1,000	\$1.05	\$.009	
Form Film	W. R. Grace & Co. 62 Whittemore Ave. Cambridge, Mass. 02140	200	\$6.40 \$3.76 (thinner)	\$.09	Advise using on forms first treated with Form Shield
Swifts #833 Parting Cpd.	Swifts Chemical Co. Oak Brook, Illinois 60521	600	\$1.85	\$.028	Mixed - 1 part 833 p.c. to 1 part kerosene
Allen Form Coating	Con-Form Equip. Corp. 225 N. Arlington Hgts. Elkgrove Village, Ill. 60007	600	Unknown	Unknown	Mixed - 1 qt. to 55 gal. No. 2 fuel oil, mineral spirits or naptha
Form Shield	W. R. Grace Co. 62 Whittemore Ave. Cambridge, Mass. 02140	600	\$1.20	\$.018	Sold primarily for sealing new wood
Swifts #842 Parting Cpd.	Swifts Chemical Co. 1211 W. 22nd St. Oak Brook, Ill. 60521	1,000	\$1.30	\$.011	Mixed - 1 part 842 pc to 2 part #1 fuel oil

CONCLUSIONS:

Using bond release effectiveness, minimum product preparation and price as criteria in choosing a particular brand, the laboratory data indicates that Magic-Kote Concentrate, Texaco Code #1590 and Magic-Kote Form Coating should be considered when selecting a form release agent to be used to aid in the stripping of forms from a latex modified concrete.

Test results obtained on the reference samples indicate that lower concrete slumps increase bond between the concrete and wooden forms. Although this factor might affect the standing of the other seven products tested, it is doubtful that any of the products would be comparable to the first three mentioned.



STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
MONTPELIER

05602

February 29, 1972

Mr. Bill Dunn
PO Box 731
Mount Holly, New Jersey 08060

Re: Your request for our evaluation of form release agents

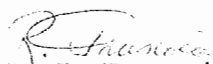
Dear Mr. Dunn:

Enclosed please find a copy of our final report on form release agents used in conjunction with latex modified concrete.

If you have any other questions, please feel free to contact us.

Very truly yours
A. W. LANE
Materials Engineer

AWL/RIF/ij
cc: AWL (Lab File)

by: 
R. I. Frascoia
Research Specialist

Encl. (1)