



AIRCO VINYL EMULSIONS

for all-weather exterior
and interior latex paints

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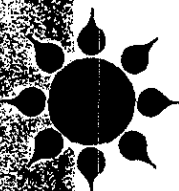
AIR REDUCTION CHEMICAL & CARBIDE CO.

A Division of
Air Reduction Company
Incorporated



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and interior latex paints

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Colton Polymers Department



VINYL RESINS FOR LATEX PAINTS

GRADE	DESCRIPTION	FILM CLARITY	WATER RESISTANCE	PAINT APPLICATIONS			
				EXTERIOR	INTERIOR	PRIMER SEALER	INDUSTRIAL
FLEXBOND® Copolymer polyvinyl acetate emulsions							
800	Very flexible, high molecular weight	Clear	Excellent	•	•	•	•
811	Flexible, high molecular weight	Clear	Excellent				•
855	Fine particle size; high flexibility; high PVC formulations	Clear	Excellent	•	•	•	•
FLEXAC Polyvinyl acetate homopolymer emulsions							
FA-5	High molecular weight; clear, glossy, excellent film former even at low temperatures	Clear	Excellent		•	•	•
VINAC® Polyvinyl acetate homopolymer emulsions							
WR-50	Clear, water-resistant films, borax stable	Clear	Very good	•	•	•	•
VINAC Polyvinyl acetate beads (resin in solid form)							
B-7	Small, glass-like spherical beads; non-blocking on storage, without refrigeration.	Clear	Very good				•
B-15	All pass 8-mesh screen, dissolve readily in wide range of solvents. Films are clear, glossy, non-toxic, water resistant	Clear	Excellent				•
B-25		Clear	Excellent				•

In less than a decade, vinyl latex paints have captured an important share of the paint market. Their sales appeal has established them as the leader for interior use and now their application and performance advantages are extending this leadership to exterior paints.

The widening market for vinyl latex paints has been stimulated by advances in polymer technology and by the development of vinyl emulsion vehicles designed for specific applications. The Colton Polymers Department of Air Reduction Chemical & Carbide Company, a division of Air Reduction Company, Inc., is a pioneer in the development of polyvinyl acetate copolymer resins and emulsions. In addition to paints, Airco resins and emulsions are used extensively in the manufacture of adhesives, textiles and paper.

Three types of Airco vinyl emulsions are available for paint manufacturing applications: FLEXBOND copolymer polyvinyl acetate; FLEXAC polyvinyl acetate; VINAC polyvinyl acetate. Each has properties and characteristics which make it suitable for specific applications. This manual has been planned to help the paint formulator in determining which PVAc emulsion would be best for his manufacturing and formulating procedures and for his end product.



**VINYL
LATEX
PAINTS**

ADVANTAGES OF VINYL LATEX PAINTS

Vinyl latex paints have become the first choice for interior use on the basis of their consumer appeal. Quality appearance, low odor level, rapid drying, and ease of clean-up established their leadership for interiors. For exterior use, they also offer superior tint retention and resistance to dirt and chalking. Vinyl latex paints form a "breathing" film which allows the evaporation of moisture from exterior surfaces and prevents blistering.

To the paint manufacturer, the advantages of vinyl latex bases include unusual ease of formulation and manufacture, low odor level and nonflammability.

While these advantages are found in most vinyl latex paint formulations, finished paints exhibit a wide range of performance properties, governed by the emulsion vehicle used. Each emulsion has distinctive physical properties which influence the performance of the finished paint. One of the key factors is the molecular weight of the polyvinyl acetate emulsion. Another is the presence of a plasticizing comonomer. Both the type and percentage of comonomer are important. Other factors include the particle size and the type of emulsifier system. In a high quality emulsion, high molecular weight, combined with high comonomer content, produces paint films which are outstanding for toughness, flexibility, resistance to thermal shock and shock from airborne particles, and resistance to ultra-violet light. Examples of such quality polymers are FLEXBOND 800 and FLEXBOND 855.

Airco FLEXBOND copolymer resins are among the highest molecular weight PVAc emulsions on the market today. The film-forming properties of polymers and correspondingly, the performance qualities of vinyl paints are related directly to molecular weight. As molecular weight increases, there are corresponding improvements in the physical properties of films, with the "highest polymers" forming the toughest films. Comparisons of intrinsic viscosity measurements of a large number of emulsions point up the high molecular

weight of FLEXBOND copolymers. In addition, FLEXBOND resins are linear polymers with almost negligible crosslinking. These properties contribute to the toughness of films and to good paint flow characteristics.

The comonomer content of Airco FLEXBOND resins contributes to flexibility and freedom from shock-brittleness. The percentage of comonomer present in FLEXBOND resins could not be tolerated by low molecular weight resins without excessive tackiness. The combination of high comonomer content plus high molecular weight produces films which are inherently tough and flexible, even at low temperatures. These characteristics make FLEXBOND copolymers ideal for exterior paints.

Airco research and development on copolymers continues, aimed at tailoring resins to maximize key properties, such as adhesion to chalky surfaces.

TECHNICAL SERVICE

Airco's staff of polymer specialists at the Paint Technical Service Laboratory in Cleveland, Ohio, combines a thorough knowledge of resins and emulsions with practical experience in the paint industry. Supplementing this background in applications is the basic research on polymers conducted by the Central Research Laboratories of Air Reduction Company, Inc., at Murray Hill, New Jersey. Research and development on surface active agents is centered at Airco Chemical & Carbide's Bound Brook, New Jersey laboratories.

To serve customers throughout the nation, Air Reduction Chemical & Carbide maintains sales offices and warehouses in principal cities.



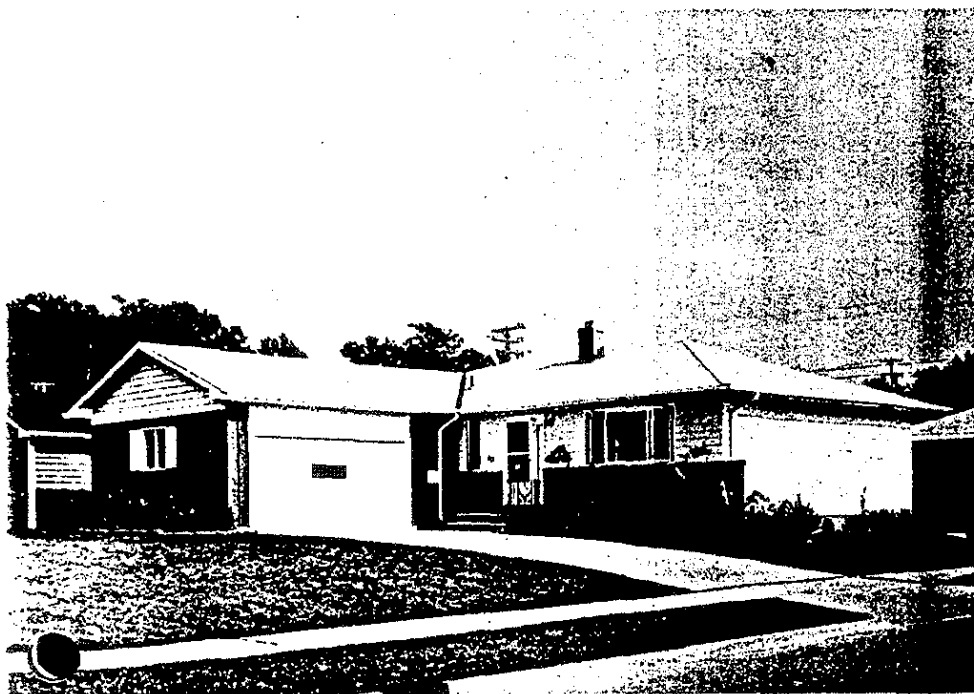
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Airco's Paint Technical Service Supervisor J. H. Fickenscher, Paint Specialist Lee Newman, and Technical Manager H. L. Jaffe call on paint manufacturers throughout the nation. Airco Technical Service specialists are available to assist with advice on formulations, manufacturing procedures, storage and handling, etc. They are prepared to work with manufacturers who wish to explore the advantages to be gained from polymer technology—broadening product lines, improving formulations, reducing production costs, increasing profit margins.

Technically trained sales representatives are supplied with up-to-date information on new products and applications. Customer service includes the prompt handling of orders, sample requests, and requests for technical service.

Airco resins and emulsions are produced at Cleveland, Ohio; Elkton, Maryland; and City of Industry, California. Their quality is assured by Airco control of the key steps of manufacture from the basic raw materials, calcium carbide and acetylene, through the production of the intermediate vinyl acetate to the preparation of the finished polymer.



Exterior house paints based on a variety of systems are being evaluated by Airco in a new housing development in suburban Parma, Ohio. In only 2 years' exposure the superiority of FLEXBOND based paints is apparent. Like the house shown at near left, the houses painted with FLEXBOND formulations still look freshly painted, bright, and clean.

Panel A-6, painted with FLEXBOND 800 emulsion, demonstrates the importance of high molecular weight and high comonomer content for exterior use. Commercial low molecular weight emulsions were used on panels A-45 and A-50. All three paints were at 25% PVC; two coats were applied directly to unprimed white pine. The panels were exposed three years, 45° S, at Elkton, Md.

Although FLEXBOND 811 is similar in most respects to FLEXBOND 800, it does not have the same high degree of flexibility and elongation. To obtain optimum film formation, baking is recommended. Films of this material, whether clear or pigmented, exhibit color stability, even under adverse conditions.

FLEXBOND 855 — A Fine Particle Size, Highly Flexible Terpolymer Emulsion

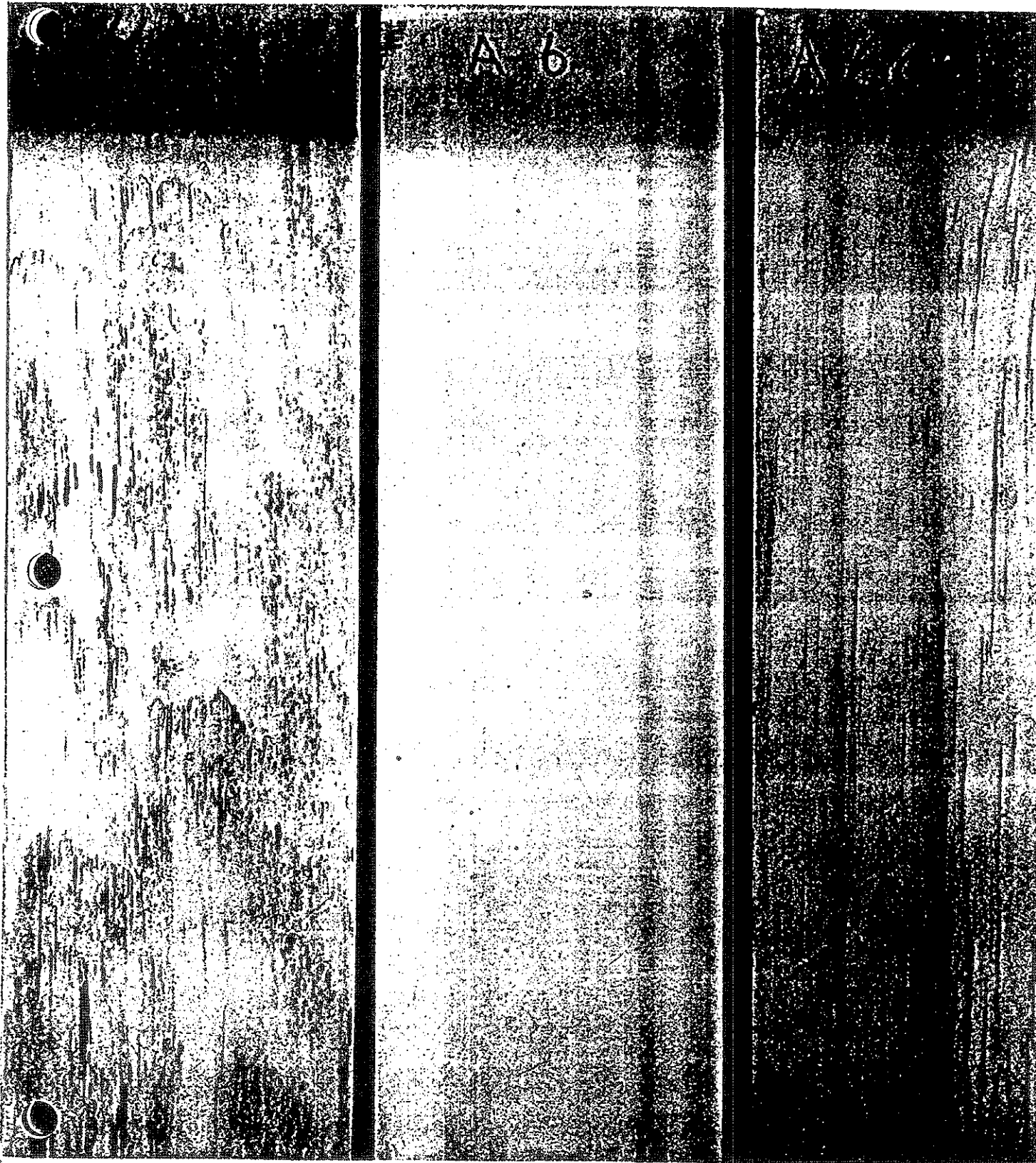
FLEXBOND 855 permits the formulation of paints with very high pigment concentrations. An extremely high PVC may be obtained without the use of film-forming aids which are present in many other emulsions and which may impair freeze-thaw stability. Films of FLEXBOND 855 combine high clarity and gloss with good water-spot resistance and flexibility. Excellent scrub resistance and stain removal are obtained even at 60% PVC and higher.

Many fine particle size PVAc emulsions have a relatively low molecular weight and as a result their films are lacking in toughness and resistance to shock. However, FLEXBOND 855 combines fine particle size with the advantages of high molecular weight. Paints based on FLEXBOND 855 also offer exceptional color development, and excellent flow and levelling.

FLEXBOND 855 is a popular vehicle for the formulation of roof paints. The flexibility of FLEXBOND 855 permits the paint film to expand and contract with the dimensional changes which occur in roofing materials.

Painted in 1956, this shingle house in Madison, New Jersey, is still a bright blue and does not need repainting. Before being painted with a FLEXBOND formulation, this suburban house had to be repainted every three years with oil paint.





GLD005960

PHYSICAL PROPERTIES

Total Solids	55-57%
Viscosity*	800-1200 cps.
Odor	Very slight
Color	White-Milky
pH	5.0-6.5
Free Monomer	Less than 0.4%
Particle Size	0.5 Micron
Mechanical Stability**	Excellent
Solvent Tolerance***	Good
Weight per Gallon	9.2 lbs.
Solids per Gallon (approx.)	5.15
Borax Stability	Excellent

* Brookfield Viscometer Model LVF (#3 spindle/60 RPM/77°F.)

** Hamilton Beach Mixer #33 (high speed)

*** Emulsion diluted with 95% ethanol to 18% diluent

FLEXAC FA-5

FILM PROPERTIES

Density	1.18 grams/cc.
Clarity	Clear, water white
Gloss	High
Heat Stability*	Very good
Light Stability	Very good
Aging Characteristics	Excellent
Film Formation**	Excellent
Water Resistance	Excellent

* Three hours at 300°F.

** Polymer should be plasticized to obtain maximum film properties

A High Molecular Weight Emulsion for Interior Use

11

FLEXAC FA-5, a polyvinyl acetate homopolymer, is recommended for the manufacture of interior paints, semi-gloss finishes and floor paints. It is not designed for exterior use.

Outstanding properties of interior paints made with FLEXAC FA-5 are: high critical pigment volume concentration; excellent scrub resistance and stain removal, and superior low temperature coalescence.

The high molecular weight of this homopolymer produces films and paints with unusual toughness and resistance to abrasion and shock. Coupled with these properties is the inherent flexibility of a film which requires a low level of additional plasticizer.

The high pigment binding capacity of FLEXAC FA-5 enables the formulation of interior paints at a low raw material cost, without detracting from scrub resistance, stain removal, and other important paint properties. The ability of FLEXAC to form films at low temperatures makes it ideal for paints which are to be used in new construction, where low temperatures may prevail for a large part of the year.

With its high gloss, clarity and superior water-spot resistance, FLEXAC FA-5 produces an excellent semi-gloss paint. Additional resins are not required to impart hardness and tack-free films, since FLEXAC FA-5 films are inherently tack-free and hard at room temperatures. Pigment volume concentrations as high as 17% and 18% have been used with this resin to formulate semi-gloss paints with a 60° gloss meter reading of over 60.

Film gloss and hardness also make FLEXAC FA-5 an ideal base for emulsion floor paints. Water resistance, ease of cleanup and stain removal, as well as wet and dry abrasion resistance, are obtainable in floor paints. A semi-gloss FLEXAC FA-5 formulation, tested over cement panels on a Gardner Straight Line Scrub Tester, withstood 4,000 cycles. (This test was run both dry and wet, with a diaper cloth and pumice.) A sample of this paint has been used in high traffic plant areas, including a concrete shipping dock, which is exposed to weather at all times. Durability on these exposures has been remarkable.



FLEXAC FA-5



Painted in October, 1957, this Northfield Center, Ohio, house indicates the durability of a FLEXBOND formulation on a variety of surfaces. Asbestos shingles, clapboards, and masonry surfaces are still bright red, unmarred by chalking, cracking, or blistering.

GLD005962

PHYSICAL PROPERTIES

Total Solids	55-57%
Viscosity*	1100-1400 cps.
Odor	Very slight
Color	Milky white
pH	4.5-6.0
Free Monomer	0.5% max.
Particle Size	0.5 Micron
Mechanical Stability**	Excellent
Solvent Tolerance***	Good
Weight per Gallon	9.25 lbs.
Solids per Gallon (approx.)	5.15
Borax Stability	Excellent

* Brookfield Viscometer Model LVF (#3 spindle/60 RPM/77°F.)

** Hamilton Beach Mixer #33 (high speed).

*** Emulsion diluted with 95% ethanol to 18% diluent.

VINAC WR-50

FILM PROPERTIES

Density	1.19 grams/cc.
Clarity	Clear
Heat Stability*	Good
Light Stability	Excellent
Film Formation	Excellent
Water Resistance	Very good

* One hour at 300°F.

A Water Resistant PVAc Homopolymer

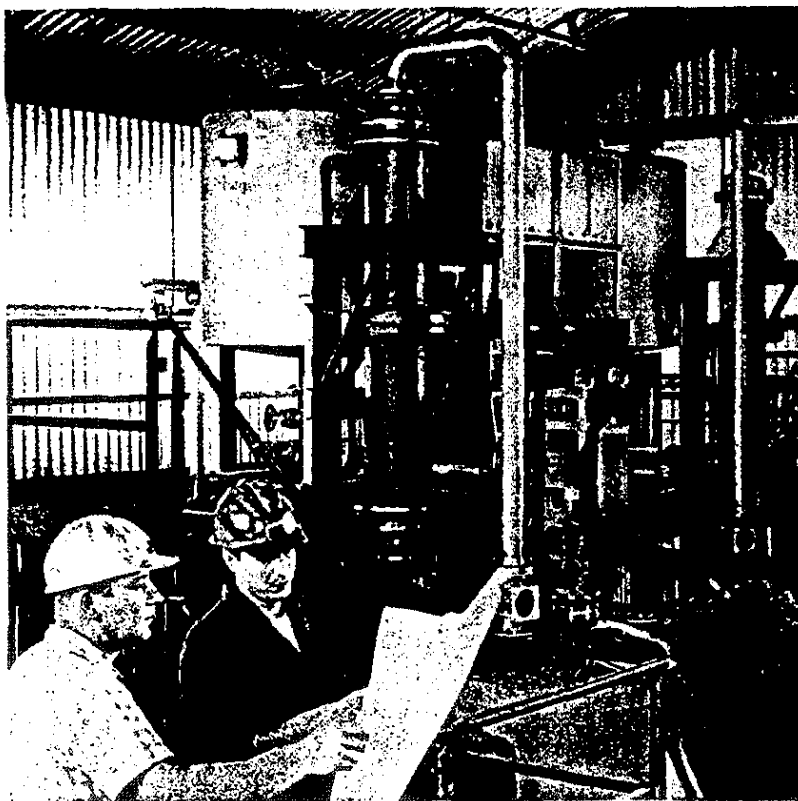
VINAC WR-50 may be formulated into paints for many types of surfaces—wood, plaster, fiberboard, acoustical tile, concrete, cinder block, asbestos, and gypsum. VINAC WR-50 may be used without a plasticizer, or modified with a suitable plasticizer to obtain desirable properties. It is being used commercially as a vehicle for exterior paint applications. VINAC WR-50 also makes an excellent primer-sealer.

One of the interesting uses of VINAC WR-50 is in ready-mixed joint cements and spackling compounds. With VINAC WR-50 it is possible to load pigments into the joint cement ("mud") or spackling compound without breaking the emulsion. The ability to tolerate high pigment loadings and also to produce excellent bonding of tape to board is unique to VINAC WR-50 and has added to its value as an easy-to-handle emulsion.

Complementing VINAC WR-50 as a base for joint cements and spackling compounds are two polyvinyl acetate homopolymers in powder form, VINAC RP-250 and VINAC RP-251. As white, redispersible powders, VINAC RP-250 and VINAC RP-251 are ideal for the formulation of dry joint cements and spackling products. A detailed bulletin on VINAC spray dried powders describes the use of VINAC RP-250 and VINAC RP-251 in these products. Suggested formulations on the use of VINAC WR-50 in joint cements and spackling compounds are also available from Airco's Paint Technical Service Laboratory.



VINAC WR-50



FLEXBOND, VINAC, and FLEXAC emulsions are produced at this new plant at City of Industry (near Los Angeles), California, and at Cleveland, Ohio, and Elkton, Maryland. The Elkton plant also produces dibutyl maleate and dibutyl phthalate. SURFYNOL surface active agents are produced at Bound Brook, New Jersey, and Calvert City, Kentucky, where Airco manufactures high-purity vinyl acetate monomer.

SUGGESTED FORMULATIONS

One of the outstanding advantages of polyvinyl acetate emulsions is the ease with which they can be formulated into quality paints. FLEXBOND copolymer emulsions are particularly easy to handle because additional plasticizers are not required. FLEXBOND, FLEXAC, and VINAC paints are formulated according to procedures which are familiar to the paint industry.

Formulations for the basic types of interior and exterior paints are shown on the following pages. These formulations were developed in Airco's Paint Technical Service Laboratory to assist paint chemists in the development of their own commercial formulations. Airco's suggested formulations show which surfactants and pigments should be used to obtain the optimum benefits from a particular emulsion system.

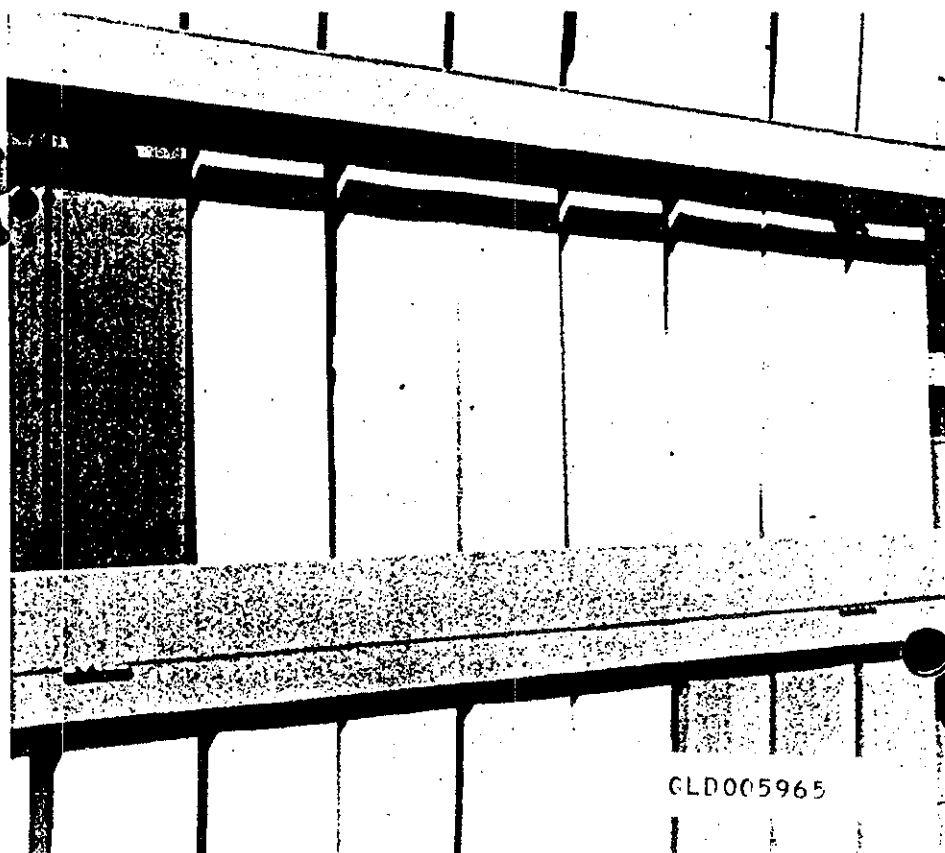
The raw materials suggested in these formulations are listed on page 20. The list includes alternate materials which could be substituted, without detracting from the properties of the emulsion system. Any substitution, of course, affects the properties of the formulation and each change should be studied carefully for its effect upon other raw materials and its contribution to the finished paint.

MANUFACTURING PROCEDURES

In the suggested formulations which follow, materials are listed in the recommended order of addition. The materials are handled in three basic steps—preparation of the pigment paste, grinding the paste, and the "let down" of the finished paint. Conventional paint manufacturing equipment is suitable for each step. Except for the



Airco maintains test fences at
Elkton, Maryland (right);
Murray Hill, New Jersey; Miami, Florida;
and Los Angeles, California.
Emulsion vehicles and exterior
formulations are evaluated carefully
to meet the needs of paint manufacturers
in all parts of the country.



GLD005965

use of water as a medium, the handling of polyvinyl acetate paints is similar to the handling of conventional paint systems.

In the first step of formulation, the pigment paste is started from a mixture of water, surface active agents, thickener, freeze-thaw stabilizer and antifoam. After these materials have been thoroughly mixed, the prime pigments and extenders are added incrementally. In order to develop maximum shear during the mixing operation, the paste must be kept fairly heavy and a final viscosity adjustment should be made prior to milling. The paste dispersion can be ground efficiently by high speed mills, or by pebble or stone mills.

The "let down" ordinarily is carried out in a thinning tank which has low speed agitation. At this point, the balance of film forming aids, wetting agents, thickeners or antifoamers is added. When these materials have been stirred thoroughly into the paste, the required amount of emulsion is added. It is important at this step to avoid vortexing which may cause foaming problems. After a final viscosity adjustment with thickener solution or water, the paint is ready for packaging.



SUGGESTED FORMULATIONS

ADDITIONAL FORMULATIONS

In addition to the suggested formulations presented for FLEXBOND 800, FLEXBOND 855, FLEXAC FA-5, and VINAC WR-50, other formulations on these emulsions are available. New formulations using these emulsions in other types of paints are issued periodically by the Paint Technical Service Laboratory. Also available are formulations for the use of FLEXBOND 811 in industrial coatings and up-to-date formulations using Colton Polymers in government specifications for PVAc paints. Formulations for thixotropic paints have also been prepared, in a range of raw material costs.



CLD005966

FLEXBOND 800**PRIMER SEALER
80010**

1.	Cellosize QP-4400 (3% Solution)	130
2.	Potassium Tripolyphosphate	2
3.	Colloid 581-B	2
4.	Ross & Rowe 551	5
5.	PMA-18	0.3
6.	Ethylene Glycol	18
7.	Titanox RA-50	75
8.	ASP-400	110
9.	Wollastonite P-1	55
10.	Water	200
11.	Carbitol	16
12.	FLEXBOND 800	415
SOLIDS:		44.4%
PVC:		29.9%
YIELD:		100 gallons
RAW MATERIAL COST:		\$1.10/gallon
VISCOSITY:		75 ± 2 K. U.

**EXTERIOR WHITE
80014**

1.	Natrosol 250 High (2% Solution)	200
2.	Polyglycol P-1200	3
3.	Igepal CTA-639	2
4.	Ross & Rowe 551	3
5.	Ethylene Glycol	25
6.	PMA-30	6
7.	Nopco NDW	2
8.	Titanox RA-50	225
9.	Titanox A-168-LO	25
10.	Nytal 300	70
11.	Water	195
12.	Carbitol Acetate	12
13.	FLEXBOND 800	340
SOLIDS:		45%
PVC:		36%
YIELD:		101 gallons
RAW MATERIAL COST:		\$1.52/gallon
VISCOSITY:		92 ± 2 K. U.

**EXTERIOR TINT BASE
80015**

1.	Natrosol 250 High (2% Solution)	200
2.	Nopco NDW	2
3.	Tamol 731	2
4.	Surfynol TG	4
5.	Ross & Rowe 551	3
6.	Ethylene Glycol	25
7.	PMA-18	6
8.	Ti-Pure R-610	150
9.	Lorite	115
10.	Water	155
11.	Carbitol Acetate	13
12.	FLEXBOND 800	380
SOLIDS:		44%
PVC:		32.2%
YIELD:		100 gallons
RAW MATERIAL COST:		\$1.35/gallon
VISCOSITY:		88 ± 2 K. U.

**INTERIOR FLAT
80011**

1.	Methocel 65-HG, 4000 cps. (3% Solution)	160
2.	Tamol 731	5
3.	Surfynol TG	3
4.	Nopco NDW	2
5.	Ethylene Glycol	25
6.	PMA-18	0.3
7.	Titanox RA-50	225
8.	Zeolex 80	15
9.	Carbium	135
10.	Celite 281	35
11.	Water	220
12.	Butyl Carbitol Acetate	8
13.	FLEXBOND 800	310
SOLIDS:		50%
PVC:		47.5%
YIELD:		100 gallons
RAW MATERIAL COST:		\$1.39/gallon
VISCOSITY:		87 ± 2 K. U.

**INTERIOR FLAT (LOW COST)
80013**

1.	Methocel 65-HG, 4000 cps. (3% Solution)	180
2.	Tamol 731	3
3.	Igepal CO-610	4
4.	Nopco NDW	2
5.	Ross & Rowe 551	2
6.	Ethylene Glycol	25
7.	PMA-18	0.3
8.	Titanox RA-50	125
9.	Zeolex 80	30
10.	Satintone #1	100
11.	Asbestine 3X	150
12.	Water	285
13.	Butyl Carbitol Acetate	6
14.	FLEXBOND 800	210
SOLIDS:		45.9%
PVC:		59%
YIELD:		100 gallons
RAW MATERIAL COST:		\$0.98/gallon
VISCOSITY:		80 ± 2 K. U.

**INTERIOR TINT BASE
80012**

1.	Methocel 65-HG, 4000 cps. (3% Solution)	160
2.	Tamol 731	2
3.	Ross & Rowe 551	3
4.	Igepal CO-610	4
5.	Nopco NDW	2
6.	Ethylene Glycol	25
7.	PMA-18	0.3
8.	Titanox RA-50	150
9.	Lorite	50
10.	Carbium	150
11.	Celite 281	35
12.	Water	198
13.	Butyl Carbitol Acetate	8
14.	FLEXBOND 800	330
SOLIDS:		49.8%
PVC:		45.9%
YIELD:		100 gallons
RAW MATERIAL COST:		\$1.22/gallon
VISCOSITY:		85 ± 2 K. U.

FLEXBOND 855**PRIMER SEALER
85510**

1.	Cellosize QP-4400 (3% Solution)	133
2.	Potassium Tripolyphosphate	2
3.	Colloid 581-B	2
4.	Ross & Rowe 551	5
5.	Ethylene Glycol	18
6.	Bufen 30	0.3
7.	Unitane OR-540	60
8.	Lorite	110
9.	Mistron HGO-75	110
10.	Water	235
11.	Carbitol	16
12.	FLEXBOND 855	370
SOLIDS:		45.2%
PVC:		35.6%
YIELD:		102 gallons
RAW MATERIAL COST:		\$1.05/gallon
VISCOSITY:		72 ± 2 K. U.

**EXTERIOR WHITE
85514**

1.	Natrosol 250 High (2% Solution)	225
2.	Polyglycol P-1200	3
3.	Igepal CTA-639	2
4.	Ross & Rowe 551	3
5.	Ethylene Glycol	25
6.	Nopco NDW	2
7.	PMA-30	6
8.	Titanox RA-50	225
9.	Titanox A-168-LO	25
10.	Nyfal 300	70
11.	Water	185
12.	Carbitol Acetate	12
13.	FLEXBOND 855	320
SOLIDS:		45%
PVC:		35.7%
YIELD:		100 gallons
RAW MATERIAL COST:		\$1.53/gallon
VISCOSITY:		90 ± 2 K. U.

**EXTERIOR TINT BASE
85515**

1.	Natrosol 250 High (2% Solution)	250
2.	Tamol 731	4
3.	Nopco NDW	2
4.	Ethylene Glycol	25
5.	PMA-30	6
6.	Ti-Pure R-610	150
7.	Camel-TEX	75
8.	Lorite	75
9.	Potassium Carbonate	1
10.	Water	125
11.	Carbitol Acetate	12
12.	Igepal CO-610	3
13.	FLEXBOND 855	350
SOLIDS:		45.7%
PVC:		35.9%
YIELD:		101 gallons
RAW MATERIAL COST:		\$1.33/gallon
VISCOSITY:		90 ± 2 K. U.

**INTERIOR FLAT
85511**

1.	Cellosize QP-4400 (3% Solution)	180
2.	Nopco NDW	3
3.	Tamol 731	6
4.	Surfynol TG	3
5.	Ethylene Glycol	25
6.	PMA-18	0.3
7.	Unitane OR-540	225
8.	Al-Sil-Ate W	65
9.	Camel-TEX	75
10.	Gold Bond R	50
11.	Potassium Carbonate	1
12.	Water	245
13.	Butyl Carbitol Acetate	7
14.	FLEXBOND 855	250
SOLIDS:		48.7%
PVC:		51.4%
YIELD:		99 gallons
RAW MATERIAL COST:		\$1.32/gallon
VISCOSITY:		87 ± 2 K. U.

**INTERIOR FLAT (LOW COST)
85513**

1.	Cellosize QP-4400 (3% Solution)	190
2.	Tamol 731	5
3.	Igepal CO-610	3
4.	Nopco NDW	2
5.	Ethylene Glycol	25
6.	PMA-30	0.3
7.	Unitane OR-540	120
8.	Zeolex 80	40
9.	Satintone #1	100
10.	Asbestine 3X	150
11.	Potassium Carbonate	1
12.	Water	295
13.	Butyl Carbitol Acetate	5
14.	FLEXBOND 855	200
SOLIDS:		45.8%
PVC:		59.4%
YIELD:		101 gallons
RAW MATERIAL COST:		\$0.96/gallon
VISCOSITY:		83 ± 2 K. U.

**INTERIOR FLAT TINT BASE
85512**

1.	Cellosize QP-4400 (3% Solution)	200
2.	Nopco NDW	3
3.	Tamol 731	5
4.	Surfynol TG	3
5.	Ethylene Glycol	25
6.	PMA-30	0.3
7.	Unitane OR-540	150
8.	Camel-TEX	175
9.	Lorite	50
10.	Gold Bond R	35
11.	Potassium Carbonate	1
12.	Water	225
13.	Butyl Carbitol Acetate	7
14.	FLEXBOND 855	260
SOLIDS:		48.6%
PVC:		51.7%
YIELD:		100 gallons
RAW MATERIAL COST:		\$1.10/gallon
VISCOSITY:		86 ± 2 K. U.



FLEXAC FA-5

INTERIOR FLAT FA-511

1.	Methocel 65 HG, 4000 cps. (3% Solution)	160
2.	Colloid 581-B	2
3.	Tamol 731	5
4.	Ethylene Glycol	25
5.	PMA-18	0.3
6.	Ti-Pure R-510	200
7.	Zeolex 80	25
8.	Asbestine 3X	140
9.	Lorite	100
10.	Potassium Carbonate	1
11.	Water	290
12.	Igepal CO-610	3
13.	Carbitol Acetate	12
14.	FLEXAC FA-5	200
15.	AIRCOFLEX DBP	10

SOLIDS: 49.9%
PVC: 57.3%
YIELD: 100 gallons
RAW MATERIAL COST: \$1.16/gallon
VISCOSITY: 89 ± 2 K. U.

PRIMER-SEALER FA-510

1.	Methocel 65 HG, 4000 cps. (3% Solution)	155
2.	Colloid 581-B	2
3.	Tamol 731	5
4.	Igepal CO-610	2
5.	Ethylene Glycol	18
6.	PMA-18	0.3
7.	Ti-Pure R-510	100
8.	Gamaco	100
9.	ASP-400	75
10.	Potassium Carbonate	1
11.	Water	241
12.	Surfynol TG	2
13.	Carbitol	16
14.	FLEXAC FA-5	320
15.	AIRCOFLEX DBP	13

SOLIDS: 44.2%
PVC: 36%
YIELD: 100 gallons
RAW MATERIAL COST: \$1.04/gallon
VISCOSITY: 78 ± 2 K. U.

INTERIOR FLAT (LOW COST) FA-513

1.	Methocel 65 HG, 4000 cps. (3% Solution)	135
2.	Colloid 581-B	2
3.	Tamol 731	5
4.	Ethylene Glycol	18
5.	PMA-18	0.3
6.	Ti-Pure R-510	150
7.	ASP-100	125
8.	Gamaco	175
9.	Celite 281	50
10.	Potassium Carbonate	1
11.	Water	344
12.	Surfynol TG	3
13.	Carbitol Acetate	8
14.	FLEXAC FA-5	155
15.	AIRCOFLEX DBP	9

SOLIDS: 50.3%
PVC: 68%
YIELD: 100 gallons
RAW MATERIAL COST: \$0.93/gallon
VISCOSITY: 82 ± 2 K. U.

VINAC WR-50

PRIMER SEALER WR-5010

1.	Cellosize QP-4400 (3% Solution)	175
2.	Colloid 581-B	3
3.	Tamol 731	5
4.	Surfynol TG	3
5.	Ethylene Glycol	25
6.	PMA-18	0.3
7.	Horse Head R-750	100
8.	Snowflake White	75
9.	ASP-400	75
10.	Water	270
11.	Carbitol Acetate	8
12.	VINAC WR-50	285
13.	AIRCOFLEX DBP	10

SOLIDS: 40.6%
PVC: 36.3%
YIELD: 100 gallons
RAW MATERIAL COST: \$0.95/gallon
VISCOSITY: 74 ± 2 K. U.

INTERIOR FLAT WR-5011

1.	Cellosize QP-4400 (3% Solution)	150
2.	Tamol 731	5
3.	Ross & Rowe 551	2
4.	Surfynol TG	3
5.	Colloid 581-B	2
6.	Ethylene Glycol	20
7.	PMA-18	0.3
8.	Horse Head R-750	225
9.	Snowflake White	115
10.	ASP-100	50
11.	Celite 281	35
12.	Water	265
13.	Carbitol Acetate	8
14.	VINAC WR-50	260
15.	AIRCOFLEX DBP	10

SOLIDS: 50.3%
PVC: 50.1%
YIELD: 100 gallons
RAW MATERIAL COST: \$1.29/gallon
VISCOSITY: 85 ± 2 K. U.

Airco emulsions are available in drum, tank truck, and tank car quantities. Drum shipments are available in 5, 10 and 30 gallon drums, lined 55 gallon open-head metal drums and 55 gallon fiber drums. Emulsions should be stored and compounded in tanks made of wood, stainless steel, glass coated steel or steel which has been coated to resist acidic corrosion. Engineering information and technical assistance on storage tank installations are available from Airco.

Polyvinyl acetate emulsions exhibit good stability when stored under normal conditions. It is advisable, however, to use shipments within six months. Since emulsions may freeze, proper precautions must be taken during cold weather. Storage areas should be kept above 50°F. During storage, some stratification of the emulsion may occur. Stratification may be corrected by rolling or agitating containers before using the emulsion.

The information and recommendations contained in this bulletin are, to the best of our knowledge, accurate and reliable. No guarantee of their accuracy is made, however, and the products discussed are sold without warranty, express or implied, and upon condition that the purchasers shall make their own tests to determine the suitability of such products for their particular purposes and uses. Nothing in this bulletin constitutes permission or a recommendation to practice or use any invention covered by any patent owned by this company or by others.

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INTERIOR FLAT (LOW COST)

WR-5013

1.	Cellosize QP-4400 (3% Solution)	145
2.	Colloid 581-B	2
3.	Tamol 731	5
4.	Ethylene Glycol	25
5.	Ross & Rowe 551	2
6.	PMA-18	0.3
7.	Horse Head R-750	170
8.	Snowflake White	150
9.	ASP-100	50
10.	Lorite	100
11.	Water	305
12.	Carbitol Acetate	8
13.	Surfynol TG	3
14.	VINAC WR-50	200
15.	AIRCOFLEX DBP	11

SOLIDS: 50.2%
PVC: 59.7%
YIELD: 100 gallons
RAW MATERIAL COST: \$1.04/gallon
VISCOSITY: 80 ± 2 K. U.

EXTERIOR WHITE

WR-5014

1.	Cellosize QP-4400 (3% Solution)	200
2.	Tamol 731	5
3.	Ross & Rowe 551	2
4.	Colloid 581-B	2
5.	Ethylene Glycol	25
6.	PMA-18	6
7.	Titanox RA-50	200
8.	Titanox A-168-LO	20
9.	Nyral 300	50
10.	Water	225
11.	Carbitol Acetate	7
12.	Surfynol TG	3
13.	VINAC WR-50	300
14.	AIRCOFLEX DBP	25

SOLIDS: 43%
PVC: 30.5%
YIELD: 101 gallons
RAW MATERIAL COST: \$1.43/gallon
VISCOSITY: 85 ± 2 K. U.

RAW MATERIAL LISTING

ADDITIVES

Thickeners:

Celiosize WP-300
Celiosize QP-4400
Celiosize QP-15000
Methocel 65 HG 4000 cps.
Methocel 65 HG 400 cps.
Natrosol 250 Medium
Natrosol 250 High

Union Carbide Chemicals Company

The Dow Chemical Company

Hercules Powder Company

Dispersants and Wetting Agents:

Igepal CO-610
Igepal CO-630
Igepal RC-520
Igepal CTA-639
Potassium Tripolyphosphate

Antara Chemicals Division—
General Aniline & Film Corp.

Victor Chemical Division—
Stauffer Chemical Company
Ross & Rowe, Inc.
Air Reduction Chemical & Carbide Co.
Rohm & Haas Company
Union Carbide Chemicals Company

Ross & Rowe 551
Surfynol TG
Tamol 731 (25% Solution)
Tergitol NPX
Tergitol NP-14

Antifoams:

Colloid 581-B
Nopco NDW
Polyglycol P-1200
Surfynol 104-A
Surfynol 104-E

Colloids, Inc.
Nopco Chemical Co.
Dow Chemical Company
Air Reduction Chemical & Carbide Co.

Film Formers:

Carbitol
Carbitol Acetate
Butyl Cellosolve Acetate
Butyl Carbitol Acetate

Union Carbide Chemicals Company

Freeze Thaw Stabilizers:

Ethylene Glycol
Diethylene Glycol

Mildewcides:

PMA-18
Troysan PMA-30
Bufen 30
Key X-10

Nuodex Products Co.
Troy Chemical Co.
Buckman Laboratories, Inc.
Key Chemicals Corporation

Plasticizers:

Aircoflex DBP
Benzoflex 9-88

Air Reduction Chemical & Carbide Co.
Tennessee Products & Chemical Corp.

PRIME PIGMENTS

Titanium Dioxide:

Horse Head R-750
Horse Head R-760
Ti-Pure R-510
Ti-Pure R-610
Ti-Pure R-900
Ti-Pure FF
Titanox RA-50
Titanox RANC
Titanox A-168-LO
Unitene OR-540

New Jersey Zinc Company

E. I. DuPont de Nemours & Co., Inc.

Titanium Pigment Corporation

American Cyanamid Company

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COLOR DISPERSIONS

California Ink Company, Inc.
E. I. DuPont de Nemours & Co., Inc.
Harshaw Chemical Company
Holland Color & Chemical Company
Imperial Color Chemical & Paper

EXTENDER PIGMENTS

Calcium Carbonates:
Camel-CARB
Camel-TEX
Camel-WITE

Carbium
Gamaco
Cal White
Snowflake
Duramite
Witcarb
Vi-Cron

Clays:
ASP-100
ASP-400
Santitone #1
Attagel 30
Al-Sil-Ate LO
Al-Sil-Ate W
Hydrite Flat
Hydrite PD-10

Mica:
325 Mesh, Water Ground
Mineralite 3X

Silicas:
Celite 281
Dustex Micro Silica
Gold Bond R
#1160 Silica

Talcs:
Asbestine 3X
Mistron HGO-75
Nytal 300

Proprietary Extenders:
Lorite
Wollastonite P-1
Zeolox 80

Harry T. Campbell Sons' Inc.

Diamond Alkali Company
The Georgia Marble Company

Thompson-Weinman & Company

Witco Chemical Company, Inc.
C. K. Williams & Company

Minerals & Chemicals Philipp Corp.

Southern Clays, Inc.

Georgia Kaolin Company

The English Mica Company
Mineralite Sales Corp.

Johns-Manville Company
Tamms Industries, Inc.

Innis-Speiden & Company, Inc.

International Talc
Sierra Talc & Clay Company
R. T. Vanderbilt Company, Inc.

DeLore Division, National Lead Co.
Godfrey L. Cabot, Inc.
J. M. Huber Corporation



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CHEMICAL PLANTS

Calvert City, Kentucky; Cleveland, Ohio; Bound Brook, New Jersey;
City of Industry, California; Elkton, Maryland

CALCIUM CARBIDE PLANTS

Calvert City, Kentucky; Ivanhoe, Virginia; Keokuk, Iowa;
Louisville, Kentucky

TECHNICAL SERVICE LABORATORIES

Bound Brook, New Jersey; Cleveland, Ohio; City of Industry, California

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