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of Product Development

VANDERBILT

Minerals

Household and Industrial Formulary No. 922



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VAN GEL[®] Magnesium Aluminum Silicate and **VEEGUM**[®] Magnesium Aluminum Silicate comprise Vanderbilt Minerals, LLC's product line of natural, purified smectite clays. When mixed with water, these clays form opaque, colloidal dispersions. The resulting colloidal structure enhances emulsion stability, suspends abrasives and thickens the formulation. Formulators can prepare cleaners that spread or spray easily, coat evenly and cling to vertical surfaces.

As stabilizing agents and rheology modifiers, **VAN GEL** and **VEEGUM** products are effective over a wide pH and temperature range. Whether combined with organic gums, like **VANZAN**[®] Xanthan Gum, or used alone, these products provide superior stability, suspending power and pour characteristics. **VAN GEL SX** is a tailored blend of bentonite clay and xanthan gum.

RECOMMENDED GRADES FOR HOUSEHOLD AND INDUSTRIAL FORMULATIONS

VAN GEL [®] B	General purpose, most economical grade for a variety of hard surface cleaners and polishes.
VAN GEL ES	For use in systems containing high levels of dissolved electrolytes.
VAN GEL O	For use in systems containing sodium hypochlorite.
VEEGUM [®] R	General purpose, widely used grade.
VAN GEL H	General purpose, industrial grade that is particularly useful in high pH formulations.
VEEGUM T	General purpose, industrial grade that is particularly useful in high pH formulations.
VAN GEL SX	General purpose, fast hydrating and efficient thickener.

HYDRATION OF VAN GEL AND VEEGUM PRODUCTS

VAN GEL and **VEEGUM** products must be properly dispersed in water for optimum performance. No other materials should be present in the water because they can interfere with proper hydration and colloidal structure formation. The degree of clay hydration is directly proportional to the amount of energy used to disperse the product. The degree of hydration therefore increases as mixing time, mixing intensity or water temperature increase.

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The following table provides suggested minimum hydration times for each of the **VAN GEL**[®] and **VEEGUM**[®] products. Actual hydration times will depend on the particular combination of batch size, mixer shear, and water temperature used. It is very important that mixing conditions be carefully controlled in order to achieve reproducible results in the final formulation.

<u>Water Temp., °C</u>	<u>Mixer Type</u>	<u>Mixer Speed, rpm</u>	<u>Minimum Suggested Mixing Time, Minutes</u>			
			<u>VAN GEL[®] B</u>	<u>VAN GEL ES VAN GEL O</u>	<u>VEEGUM[®] R VAN GEL H VEEGUM T</u>	<u>VAN GEL SX</u>
25	Propeller	800	120	30	120	15
75	Propeller	800	45	20	45	10
25	Homogenizer	3000	30	20	30	10
75	Homogenizer	3000	15	10	15	10

VAN GEL Magnesium Aluminum Silicate, **VEEGUM** Magnesium Aluminum Silicate and **VANZAN** Xanthan Gum are registered trademarks of R.T. Vanderbilt Holding Company, Inc. and/or its respective wholly owned subsidiaries.

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FORMULARY

GENERAL CLEANERS/CLEANSERS

Liquid Cleanser No. 531
Liquid Cleanser No. 580
Liquid Tile Cleaner No. 396
Bathroom Cleaner No. 393
Low Foam Spray Alkaline Cleaner No. 561

BLEACH CLEANERS/CLEANSERS

Liquid Cleanser with Bleach No. 552
Thickened Bleach Cleaner No. 543
Toilet Bowl Cleaner No. 544
Thickened Bleach Cleaner No. 493

"GREEN" / NATURAL FORMULATIONS

Non-Silicone Furniture Polish No. 579
"Green" Liquid Cleanser No. 592
"Green" Toilet Bowl Cleaner No. 593
Toilet Bowl Cleaner with "Green" Actives No. 605
Natural Citrus Furniture Polish No. 608
"Green" Waterless Hand Cleaner No. 615

OVEN & GRILL CLEANERS

Oven Cleaner No. 461
Solvent-Free Oven and Grill Cleaner No. 227
Potassium Carbonate Oven Cleaner No. 606

METAL SUBSTRATE CLEANERS & POLISHES

Copper and Brass Cleaner No. 394
Liquid Silver Cleaner No. 398
Cold-Process Car Polish No. 581

ACID CLEANERS

Acid Bowl Cleaner No. 342
Acid Cleaner No. 540
Oxalic Acid Gel No. 466
Acid Cleaner No. 559
Concentrated Phosphoric Acid Gel No. 607

PAINT & RUST REMOVAL FORMULATIONS

Paint Stripper for Metal No. 248
Solvent Paint Remover No. 249
Low VOC Paint Remover No. 563
Rust Removal Jelly No. 467

MISCELLANEOUS

Fine Fabric Wash No. 560
Aerosol Protective Oven Film No. 251

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VANDERBILT

Minerals Formula

Liquid Cleanser No. 531

	Wt. %
A VAN GEL® ES Magnesium Aluminum Silicate	3.5
Water	69.7
B Calcium Carbonate (#8 White ¹)	20.0
Sodium methyl-2-sulfo C ₁₂ -C ₁₈ ester (and) Disodium 2-sulfo C ₁₂ -C ₁₈ fatty acid (ALPHA-STEP® MC-48 ²)	2.5
C Fatty Alkanolamide (NINOL® 11-CM ²)	2.0
Sodium Hydroxide, 50% solution	0.3
Sodium Chloride	2.0
D Preservative	qs

Procedure:

1. Sift the **VAN GEL ES** into an established vortex in the water. Mix at maximum available shear until fully hydrated.
2. Add the calcium carbonate and mix until uniform.
3. Reduce the mixing speed to a minimum; add the Part C and D ingredients in order, mixing after each addition until uniform. Avoid air entrapment.

RAW MATERIAL SUPPLIERS

¹Imerys, Inc., Roswell, GA

²Stepan Company, Northfield, IL

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ALPHA-STEP and NINOL are registered trademarks of Stepan Company.

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Minerals Formula

Liquid Cleanser No. 580

		Wt. %
A	VAN GEL® B Magnesium Aluminum Silicate	1.1
	VANZAN® Xanthan Gum	0.4
	Water	73.5
B	Sodium Linear Alkyl Benzene Sulfonate, 60% (CALSOFT® L-60 ¹)	5.0
	Octoxynol-9 (TRITON® X-100 ²)	5.0
C	Aluminum Silicate (KAOPOLITE® SF ³)	10.0
D	Orange Oil (Tech Grade d-limonene ⁴)	5.0
E	Preservative	qs

Procedure:

1. Blend the **VAN GEL B** and **VANZAN** and sift into an established vortex in the water. Mix at maximum available shear until fully hydrated.
2. Reduce the mixing speed to a minimum and add the Part B ingredients in order, mixing after each addition until uniform. Avoid air entrapment.
3. Add the Part C, D and E ingredients in order, mixing after each addition until uniform.

RAW MATERIAL SUPPLIERS

¹Pilot Chemical Company, Cincinnati, OH

²Dow Chemical, Midland, MI

³Imerys, Inc., Roswell, GA

⁴Florida Chemical, Inc., Winter Haven, FL

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Minerals Formula

Liquid Tile Cleaner No. 396

	Wt. %
A VAN GEL® B Magnesium Aluminum Silicate	1.5
Water	76.5
B DARVAN® 7 Sodium Polymethacrylate	2.0
Octoxynol-13 (TRITON® X-102 ¹)	5.0
Sodium Alkylbenzene Sulfonate (CALSOFT® L-40 ²)	5.0
Pine Oil	5.0
Aluminum Silicate (KAOPOLITE® SF ³)	5.0
C Preservative	qs

Procedure:

1. Sift the **VAN GEL B** into an established vortex in the water. Mix at maximum available shear until fully hydrated.
2. Reduce the mixing speed and add the Part B and C ingredients in order, mixing after each addition until uniform.

RAW MATERIAL SUPPLIERS

¹Dow Chemical, Midland, MI

²Pilot Chemical Company, Cincinnati, OH

³Imerys, Inc., Roswell, GA

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Minerals Formula

Bathroom Cleaner No. 393

	Wt. %
A VAN GEL® B Magnesium Aluminum Silicate	1.00
VANZAN® Xanthan Gum	0.35
Deionized Water	86.65
B Diatomaceous Earth (SUPER-FINE SUPER FLOSS® ¹)	5.00
Tetrasodium EDTA	2.75
Sodium o-Phenylphenate (DOWICIDE® A ²)	0.25
Sodium Alkylbenzene Sulfonate (CALSOFT® L-40 ³)	3.00
Glycol Ether Solvent (BUTYL CELLOSOLVE® ²)	1.00
C Preservative	qs

Procedure:

1. Blend the **VAN GEL B** and **VANZAN** and sift into an established vortex in the water. Mix at maximum available shear until fully hydrated.
2. Reduce the mixing speed and add the Parts B and C ingredients in order, mixing after each addition until uniform.

RAW MATERIAL SUPPLIERS

¹IMERYS Filtration Minerals, Lampoc, CA

²Dow Chemical, Midland, MI

³Pilot Chemical Company, Cincinnati, OH

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Minerals Formula

Low Foam Spray Alkaline Cleaner No. 561

	Wt.%
A	VAN GEL® B Magnesium Aluminum Silicate 1.66
	VANZAN® Xanthan Gum 0.33
	Deionized Water 73.91
B	Sodium Metasilicate-9-hydrate 4.50
	C ₃ -C ₉ Acid Carboxylate (DETERGE LF-7315 ¹) 8.00
	Complex Carboxylic Acid Derivative (DECORE IMT-100LF ¹) 5.00
	Alkoxylated Linear Alcohol (DEIONIC LF-EP-25 ¹) 3.00
	Sodium Hydroxide, 50% solution 3.60

Procedure:

- 1 Blend the **VAN GEL B** and **VANZAN** and sift into an established vortex in the water. Mix at maximum available shear until fully hydrated.
- 2 Add the sodium metasilicate-9-hydrate and dissolve with mixing.
- 3 Reduce the mixing speed and add the remaining Part B ingredients in order, mixing after each addition until uniform.

RAW MATERIAL SUPPLIERS

¹ DeForest Enterprises, Inc., Boca Raton, FL

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Minerals Formula

Liquid Cleanser with Bleach No. 552

		Wt.%
A	VAN GEL® O Magnesium Aluminum Silicate	4.0
	Water	62.0
B	NaOH, 50% solution	1.0
	Commodity NaOCl, 12.5% solution	12.0
	Sodium Dodecyl Diphenyl Oxide Disulfonate (CALFAX® DB-45 ¹)	1.0
	Calcium Carbonate (#8 White ²)	20.0

Procedure:

1. Sift the **VAN GEL O** into an established vortex in the water. Mix at maximum available shear until fully hydrated.
2. Slowly add the NaOH solution while mixing. Careful control of the mixing speed is required during this step because the viscosity of the batch will increase. Mix until smooth.
3. Check the pH of the batch: it should be >pH 12. Reduce the mixing speed and slowly add the NaOCl.
4. Reduce the mixing speed to a minimum, then add the surfactant. Avoid air entrapment.
5. Slowly add the calcium carbonate and mix very slowly until homogeneous. Avoid air entrapment.

Note: The amount of NaOH in the formula is critical: percentages above or below that listed will be detrimental to the physical and/or bleach stability of the formula. Some of the other factors that can influence both the physical stability and bleach stability of this formula are: any factor that will accelerate bleach decomposition, e.g. metallic contaminants; the amount and source of the commodity bleach; the source of the caustic; the amount and type of surfactant; and the storage conditions of the finished product. It is recommended that the physical and bleach stability profile of this formula be verified.

RAW MATERIAL SUPPLIERS

¹Pilot Chemical Company, Cincinnati, OH

²Imerys, Inc., Roswell, GA

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Calfax is a registered trademark of Pilot Chemical Corp.

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Thickened Bleach Cleaner No. 543

	Wt %
A VAN GEL® O Magnesium Aluminum Silicate	2.50
Water	32.37
Carbomer, 1% Pre-gel*	50.00
B NaOH, 50% solution	2.13
Commodity NaOCl, 12.5% solution	12.00
Sodium Dodecyl Diphenyl Oxide Disulfonate (CALFAX® DB-45 ¹)	1.00

Procedure:

1. Sift the **VAN GEL O** into an established vortex in the water. Mix at maximum available shear until fully hydrated.
2. Slowly add the neutralized 1% Carbopol pre-gel to the **VAN GEL O** dispersion with mixing. Careful control of the mixing speed is required during this step due to a rapid increase in viscosity, followed by a decrease.
3. Slowly add the 50% NaOH solution. Check the pH and adjust if necessary to pH =12.7±0.1.
4. Reduce the mixing speed and slowly add the NaOCl solution while mixing. A drop in formula viscosity occurs.
5. Reduce the mixing speed to a minimum and add the surfactant.
6. If necessary, adjust the mixture with additional 50% NaOH solution to pH=12.6±0.1.

*Carbopol Pre-gel:

CARBOPOL® C-676 ²	1.00
Water	96.05
NaOH, 50% solution	2.95

Procedure for Pre-gel:

1. Carefully sift the Carbopol C-676 into an established vortex in the water. Avoid lumping. Mix with good agitation for a minimum of 45 minutes.
2. Very slowly add the 50% NaOH solution with good mixing. Rapid thickening will occur, followed by some decrease in viscosity as the pH increases. Adjust the pH as necessary with additional 50% NaOH solution to pH 12.4±0.1.

Note:

Strict control of the NaOH level to adjust the formula pH is required because it affects the initial viscosity and physical stability of the formula, due to the inherent properties of the carbomer. Proper pH control is also essential for bleach stability. Some of the other factors that can influence both the physical stability and bleach stability of this formula are: any factor that will accelerate bleach decomposition, e.g. metallic contaminants; the amount and source of the commodity bleach; the source of the caustic; the amount and type of surfactant; and the storage conditions of the finished product. It is recommended that the physical and bleach stability profile of this formula be verified.

RAW MATERIAL SUPPLIERS

- ¹Pilot Chemical Company, Cincinnati, OH
²Lubrizol Advanced Materials, Inc., Cleveland, OH

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Carbopol is a registered trademark of Lubrizol Advanced Materials, Inc.

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Toilet Bowl Cleaner No. 544

	Wt. %
A VAN GEL® O Magnesium Aluminum Silicate	0.5
Water	19.8
B Carbomer, 0.75% Pre-gel*	66.7
Commodity NaOCl, 12.5%	12.0
Sodium Dodecyl Diphenyl Oxide Disulfonate (CALFAX® DB-45 ¹)	1.0

Procedure:

1. Sift the **VAN GEL O** into an established vortex in the water. Mix at maximum available shear until fully hydrated.
2. Slowly add the neutralized 0.75% Carbopol pre-gel to the **VAN GEL O** dispersion with mixing. Careful control of the mixing speed is required during this step due to a rapid increase in viscosity, followed by a decrease.
3. Check the formula at this point and if necessary, adjust the pH to 12.4 ± 0.1 .
4. Reduce the mixing speed and slowly add the NaOCl solution while mixing. A drop in formula viscosity occurs.
5. Reduce the mixing speed to a minimum and add the surfactant.
6. Adjust the pH with additional 50% NaOH solution, if necessary, to $\text{pH} = 12.4 \pm 0.1$.

*Carbopol Pre-gel:

CARBOPOL® C-676 ²	0.75
Water	97.05
NaOH, 50% solution	2.20

Procedure for Pre-gel:

1. Carefully sift the Carbopol C-676 into an established vortex in the water. Avoid lumping. Mix with good agitation for a minimum of 45 minutes.
2. Very slowly add the 50% NaOH solution with good mixing. Rapid thickening will occur, followed by some decrease in viscosity as the pH increases. Adjust the pH as necessary with additional 50% NaOH solution to $\text{pH} 12.4 \pm 0.1$.

NOTE:

Strict control of the NaOH level to adjust the formula pH is required because it affects the initial viscosity and physical stability of the formula, due to the inherent properties of the carbomer. Proper pH control is also essential for bleach stability. Some of the other factors that can influence both the physical stability and bleach stability of this formula are: any factor that will accelerate bleach decomposition, e.g. metallic contaminants; the amount and source of the commodity bleach; the source of the caustic; the amount and type of surfactant; and the storage conditions of the finished product. It is recommended that the physical and bleach stability profile of this formula be verified.

RAW MATERIAL SUPPLIERS

- ¹Pilot Chemical Company, Cincinnati, OH
²Lubrizol Advanced Materials, Inc., Cleveland, OH

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Calfax is a registered trademark of Pilot Chemical Corp.
Carbopol is a registered trademark of Lubrizol Advanced Materials, Inc.

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Distributed in the Interest
of Product Development

VANDERBILT

Minerals Formula

Thickened Bleach Cleaner No. 493

		Wt. %
A	VAN GEL® O Magnesium Aluminum Silicate	3.0
	Deionized Water	83.0
B	NaOH (50% solution)	1.0
	Commodity NaOCl (12.5% solution)	12.0
	Sodium Dodecyl Diphenyl Oxide Disulfonate (Calfax® DB-45 Surfactant ¹)	1.0

Procedure:

1. Sift the **VAN GEL O** into an established vortex in the deionized water. Mix at maximum available shear until completely hydrated.
2. Slowly add the NaOH solution while mixing. Careful control of mixing speed is required during this step because the viscosity of the batch will increase. Mix until smooth.
3. Check the pH of the batch; it should be above pH 12. Reduce mixing speed and slowly add the NaOCl solution. Mix until uniform.
4. Reduce the mixing speed to a minimum, then add the surfactant. Mix until uniform while avoiding air entrapment.

Formula Characteristics:

Initial pH: 12.5
Initial Assay: 1.5% NaOCl

Additional Formula Considerations:

Strict control of the NaOH level to adjust formula pH is required in the preparation of this formula. Proper pH control is essential over the storage life of the product since it has a direct effect on bleach loss. Improper pH control will result in excessive bleach loss.

Some of the other factors that can influence the bleach stability of this formula are: any factor that will accelerate bleach decomposition, e.g. metallic contaminants; the amount and source of the commodity bleach; the source of the caustic; the amount and type of surfactant and the storage conditions of the finished product.

It is therefore recommended that the bleach stability profile of this formula be verified.

RAW MATERIAL SUPPLIERS

¹Pilot Chemical Company, Cincinnati, OH

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VANDERBILT

Minerals Formula

Non-Silicone Furniture Polish No. 579

		Wt. %
A	VAN GEL® B Magnesium Aluminum Silicate	1.10
	VANZAN® Xanthan Gum	0.40
	Water	73.15
B	Beeswax Emulsion (Kahl Emulsion BE 720 ¹)	10.00
	Carnauba Wax Emulsion, 40%	10.00
C	Emulsifying Agent (PLURONIC® L44 ²)	0.35
	Orange Oil (Tech Grade d-limonene ³)	5.00
D	Preservative	qs

Procedure:

1. Blend the **VAN GEL B** and **VANZAN** and sift into an established vortex in the water. Mix at maximum available shear until fully hydrated.
2. Add the Parts B, C and D ingredients in order, mixing after each addition until uniform. Avoid air entrapment.

RAW MATERIAL SUPPLIERS

¹DeWolf Chemical, Inc., East Providence, RI

²BASF Performance Chemicals, Mount Olive, NJ

³Florida Chemical, Winter Haven, FL

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VANDERBILT

Minerals Formula

"Green" Liquid Cleanser No. 592

		Wt. %
A	VAN GEL® B Magnesium Aluminum Silicate	1.10
	VANZAN® Xanthan Gum	0.40
	Water	68.50
B	Pumice (Hess Pumice Grade: FFFF ¹)	20.00
C	Sodium Methyl 2-sulfolaurate & Disodium 2-sulfolaurate (ALPHA-STEP® MC-48 ²)	5.00
	Orange Oil (Tech Grade d-limonene ³)	5.00
D	Preservative	q.s.

Procedure:

1. Slowly add the **VAN GEL B** and **VANZAN** sequentially or as a dry blend into an established vortex in the water. Mix at maximum available shear until the **VAN GEL B** is fully hydrated and the **VANZAN** is dissolved.
2. Slowly add the pumice and mix until uniform.
3. Reduce the mixing speed to a minimum; add the Part C & D ingredients in order, mixing after each addition, until uniform. Avoid air entrapment.

RAW MATERIAL SUPPLIERS

¹Hess Pumice Products, Inc., Malad City, ID

²Stepan Company, Northfield, IL

³Florida Chemical, Inc., Winter Haven, FL

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VANDERBILT

Minerals Formula

“Green” Toilet Bowl Cleaner No. 593

		Wt. %
A	VAN GEL[®] ES Magnesium Aluminum Silicate	1.40
	VANZAN[®] Xanthan Gum	0.30
	Water	84.80
B	L(+)-lactic acid, 80% (PURAC [®] Sanilac ¹)	10.00
	Sodium Methyl 2-sulfolaurate & Disodium 2-sulfolaurate (ALPHA-STEP [®] MC-48 ²)	3.50

Procedure:

1. Slowly add the **VAN GEL ES** and **VANZAN** sequentially or as a dry blend into an established vortex in the water. Mix at maximum available shear until the **VAN GEL ES** is fully hydrated and the **VANZAN** is fully dissolved.
2. Slowly add the Part B ingredients, mixing well after each until uniform. Avoid air entrapment.

RAW MATERIAL SUPPLIERS

¹PURAC America, Lincolnshire, IL

²Stepan Company, Northfield, IL

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VANDERBILT

Minerals Formula

Toilet Bowl Cleaner with "Green" Actives No. 605

		Wt. %
A	VAN GEL[®] SX Bentonite Clay (Bentonite (and) Xanthan Gum)	2.0
	Water	84.5
B	L(+)-lactic acid, 80% (PURAC [®] Sanilac ¹)	10.0
	Sodium methyl 2-sulfolaurate & Disodium 2-sulfolaurate (ALPHA-STEP [®] MC-48 ²)	3.5

Procedure:

1. Add the **VAN GEL SX** slowly to the water agitated at high speed. Mix until fully hydrated.
2. Slowly add the Part B ingredients in order, mixing well after each until uniform. Avoid air entrapment.

RAW MATERIAL SUPPLIERS

¹PURAC America, Lincolnshire, IL

²Stepan Company, Northfield, IL

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VANDERBILT

Minerals Formula

Natural Citrus Furniture Polish No. 608

		Wt. %
A	VAN GEL[®] SX Bentonite Clay (Bentonite (and) Xanthan Gum)	2.0
	Water	72.65
B	Beeswax Emulsion (BE 720 ¹)	10.00
	Carnauba Wax Emulsion, 40%	10.00
C	Emulsifying Agent (PLURONIC [®] L44 ²)	0.35
	Orange Oil (Tech Grade d-limonene ³)	5.00
D	Preservative	qs

Procedure:

1. Add the **VAN GEL SX** slowly to the water agitated at high speed. Mix until fully hydrated.
2. Slowly add the Part B and Part C ingredients in order, mixing well after each until uniform. Avoid air entrapment.

RAW MATERIAL SUPPLIERS

¹DeWolf Chemical, Inc., East Providence, RI

²BASF Performance Chemicals, Mount Olive, NJ

³Florida Chemical, Winter Haven, FL

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VANDERBILT

Minerals Formula

“Green” Waterless Hand Cleaner No. 615

	Wt. %
A VAN GEL® SX Bentonite Clay (Bentonite (and) Xanthan Gum)	4.0
Water	76.0
Propylene glycol, USP	5.0
Sodium Lauryl Sulfate (Calfoam® SLS-30 ¹)	1.5
B Orange Oil (tech grade d-limonene ²)	5.0
C16-C18 Methyl Ester/Sodium Dioctyl Sulfosuccinate Surfactant	5.0
Blend (Soygold 2500™ Rinseable Solvent ³)	
C Juglans Regia (Walnut) Shell Powder (AD-9 Cosmetic Grade (Sterilized) 40/100 Walnut Shell Raw Material ⁴)	3.5
D Preservative	q.s.

Procedure:

1. Sift the **VAN GEL SX** into an established vortex in the water. Mix until fully hydrated.
2. Add the Part B ingredients and mix thoroughly after each.
3. Sift in the ground walnut shell abrasive and mix thoroughly.
4. Add the preservative (Part D) and mix thoroughly.

Because of the solvents in the formula, verify compatibility with the intended packaging.

RAW MATERIAL SUPPLIERS

¹Pilot Chemical Company, Cincinnati, OH

²Florida Chemical, Inc., Winter Haven, FL

³Ag Environmental Products, LLC, Omaha, NE

⁴Composition Materials Co., Inc., Milford, CT

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VANDERBILT

Minerals Formula

Oven Cleaner No. 461

	Wt.%
A VAN GEL® B Magnesium Aluminum Silicate	2.00
Water	76.25
B Glycol Ether Solvent (DOWANOL® DB ¹)	10.00
Sodium Hydroxide, 50% solution	10.00
Aminomethyl Propanol, 95%	1.50
Sodium Cocoamphoacetate (Amphosol® 1C ²)	0.25

Procedure:

1. Sift the **VAN GEL B** into an established vortex in the water. Mix at maximum available shear until fully hydrated. Please review our [Preparation of Dispersions](#) trifold.
2. Add the Part B ingredients, mix well after each until uniform while avoiding air entrapment. Add the NaOH solution slowly, adjusting the mixing speed as necessary to compensate for the viscosity increase.

RAW MATERIAL SUPPLIERS

¹Dow Chemical, Midland, MI

²Stepan Company, Northfield, IL

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VANDERBILT

Minerals Formula

Solvent-Free Oven and Grill Cleaner No. 227

	Wt. %
A VEEGUM® T Magnesium Aluminum Silicate	0.75
VANZAN® Xanthan Gum	0.25
Water	77.00
B Sodium Hydroxide, 50% solution	20.00
Sodium Cocoamphoacetate (Amphosol®1C ¹)	2.00

Procedure:

1. Blend the **VEEGUM T** and **VANZAN** and sift into an established vortex in the water. Mix at maximum available shear until fully hydrated.
2. Slowly add the NaOH solution while adjusting the mixing speed as necessary to compensate for the viscosity increase. Mix until smooth and then slowly add the surfactant. Avoid air entrapment.

RAW MATERIAL SUPPLIERS

¹Stepan Company, Northfield, IL

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VANDERBILT

Minerals Formula

Potassium Carbonate Oven Cleaner No. 606

		Wt. %
A	VAN GEL® SX Bentonite Clay (Bentonite (and) Xanthan Gum)	2.0
	Water	54.0
B	Triethanolamine	10.0
	Tripropyleneglycol Methyl Ether Solvent (DOWANOL® TPM ¹)	5.0
	Potassium Carbonate, 25% Solution	28.0
	Sodium Cocoyl Sarcosinate, 30% Solution (PERLASTAN® C-30 ²)	1.0

Procedure:

1. Add the **VAN GEL SX** slowly to the water agitated at high speed. Mix until fully hydrated.
2. Reduce the mixing speed and add the Part B ingredients in order, mixing after each addition until uniform. Avoid air entrapment.

RAW MATERIAL SUPPLIERS

¹Dow Chemical Company, Midland, MI

²Struktol Company of America, Stow, OH

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VANDERBILT

Minerals Formula

Copper and Brass Cleaner No. 394

		Wt. %
A	VAN GEL® B Magnesium Aluminum Silicate	1.5
	Water	43.0
B	Diatomaceous Earth (SUPER-FINE SUPER FLOSS® ¹)	15.0
	Ammonium hydroxide	1.0
C	Mineral Spirits	30.0
	Oleic Acid	8.0
	Oleamide DEA (NINOL® 201 ²)	1.5
D	Preservative	qs

Procedure:

1. Sift the **VAN GEL B** into an established vortex in the water. Mix at maximum available shear until fully hydrated.
2. Add the Part B ingredients in order, mixing after each addition until uniform.
3. Mix the Part C ingredients until the mixture is clear and then add to the water phase at maximum available shear until emulsified.
4. Add part D and mix until uniform.

RAW MATERIAL SUPPLIERS

¹IMERYS Filtration Minerals, Lompoc, CA
²Stepan Company, Northfield, IL

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Distributed in the Interest
of Product Development

VANDERBILT

Minerals Formula

Liquid Silver Cleaner No. 398

		Wt. %
A	VEEGUM® R Magnesium Aluminum Silicate	2.0
	Cellulose Gum (Aqualon® CMC 7MT ¹)	0.3
	Water	77.2
B	Diatomaceous Earth (SNOW FLOSS™ ²)	15.0
C	Octoxynol-13 (TRITON® X-102 ³)	5.0
	VANCHEM® NATD Disodium Dimercaptotriazazole	0.5
D	Preservative	qs

Procedure:

1. Blend the **VEEGUM R** and CMC and sift into an established vortex in the water. Mix at maximum available shear until fully hydrated.
2. Add Part B and mix until smooth.
3. Reduce the mixing speed and add the Part C ingredients in order, mixing after each addition until uniform.
4. Add part D and mix until uniform.

RAW MATERIAL SUPPLIERS

¹Ashland Specialty Ingredients, Wilmington, DE

²IMERYS Filtration Minerals, Lompoc, CA

³Dow Chemical, Midland, MI

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of Product Development

VANDERBILT

Minerals Formula

Cold-Process Car Polish No. 581

		Wt. %
A	VANZAN [®] Xanthan Gum	1.00
	Water	52.15
B	Polydimethylsiloxane emulsion (Dow Corning [®] 346 Emulsion ¹)	11.50
	Carnauba Wax Emulsion, 40%	10.00
C	Emulsifying Agent (PLURONIC [®] L44 ²)	0.35
	Isoparaffinic Solvent (ISOPAR [®] M Fluid ³)	10.00
D	Aluminum Silicate (KAOPOLITE [®] SF ⁴)	15.00
E	Preservative	qs

Procedure:

1. Sift the **VANZAN** into an established vortex in the water. Mix until fully dissolved.
2. Add the Part B ingredients in order, mixing after each addition until uniform.
3. Add the Part C ingredients in order, mixing after each addition until uniform.
4. Add Parts D and E and mix until uniform.

RAW MATERIAL SUPPLIERS

¹Dow Corning Corp., Midland, MI

²BASF Performance Chemicals, Mount Olive, NJ

³ExxonMobil Chemical, Houston, TX

⁴Imerys, Inc., Roswell, GA

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VANDERBILT

Minerals Formula

Acid Bowl Cleaner No. 342

	Wt.%
A VEEGUM [®] R Magnesium Aluminum Silicate	0.90
VANZAN [®] Xanthan Gum	0.45
Water	75.40
B Tetrasodium EDTA	1.00
Oleyl Hydroxyethyl Imidazoline (MONAZOLINE O ¹)	1.00
Hydrochloric Acid, 37%	20.00
Benzalkonium Chloride (BARQUAT [®] MB-80 ²)	1.25

Procedure:

1. Blend the **VEEGUM R** and **VANZAN** and sift into an established vortex in the water. Mix at maximum available shear until fully hydrated.
2. Reduce the mixing speed and add the Part B ingredients in order, mixing after each addition until uniform.

RAW MATERIAL SUPPLIERS

¹Croda Inc., Edison, NJ

²Lonza, Inc., Allendale, NJ

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Distributed in the Interest
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VANDERBILT

Minerals Formula

Acid Cleaner No. 540

		Wt. %
A	VAN GEL ® ES Magnesium Aluminum Silicate	2.0
	VANZAN ® Xanthan Gum	0.5
	Water	62.5
B	Phosphoric Acid, 85%	30.0
	Octoxynol-9 (TRITON® X-100 ¹)	5.0

Procedure:

1. Blend the **VAN GEL ES** and **VANZAN** and sift into an established vortex in the water. Mix at maximum available shear until fully hydrated.
2. Reduce the mixing speed and add the Part B ingredients in order, mixing after each addition until uniform.

RAW MATERIAL SUPPLIERS

¹Dow Chemical, Midland, MI

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VANDERBILT

Minerals Formula

Oxalic Acid Gel No. 466

	Wt. %
A VAN GEL [®] B Magnesium Aluminum Silicate	2.5
VANZAN [®] Xanthan Gum	0.8
Water	53.7
B Oxalic Acid Dihydrate, 12.5% Aqueous Soln.	40.0
Polysorbate 40 (TWEEN [®] 40 ¹)	3.0

Procedure:

1. Blend the **VAN GEL B** and **VANZAN** and sift into an established vortex in the water. Mix at maximum available shear until fully hydrated.
2. Reduce the mixing speed and add the Part B ingredients in order, mixing after each addition until uniform.

RAW MATERIAL SUPPLIERS

¹Croda Inc., Edison, NJ

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VANDERBILT

Minerals Formula

Acid Cleaner No. 559

		Wt. %
A	VANZAN® Xanthan Gum	1.1
	Water	66.9
B	Phosphoric Acid, 85%	30.0
	Modified ethoxylated carboxylate (DeTERGE LF-7315 ¹)	2.0

Procedure:

1. Sift the **VANZAN** into an established vortex in the water. Mix until fully dissolved.
2. Add the phosphoric acid slowly and mix thoroughly. Reduce mixing speed and then add the surfactant slowly. Mix until uniform while avoiding air entrapment.

RAW MATERIAL SUPPLIERS

¹DeForest Enterprises, Inc., Boca Raton, FL

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VANDERBILT

Minerals Formula

Concentrated Phosphoric Acid Gel No. 607

		Wt.%
A	VAN GEL® SX Bentonite Clay (Bentonite (and) Xanthan Gum)	2.5
	Water	62.5
B	Phosphoric Acid, 85%	30.0
	Octoxynol-9 (TRITON® X-100 ¹)	5.0

Procedure:

1. Add the **VAN GEL SX** slowly to the water agitated at high speed. Mix until fully hydrated.
2. Reduce the mixing speed and add the Part B ingredients in order, mixing after each addition until uniform. Avoid air entrapment.

RAW MATERIAL SUPPLIERS

¹Dow Chemical, Midland, MI

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VANDERBILT

Minerals Formula

Paint Stripper for Metal No. 248

	Wt. %
A VEEGUM [®] T Magnesium Aluminum Silicate	0.75
VANZAN [®] Xanthan Gum	0.25
Water	65.50
B Sodium Xylene Sulfonate, 40% liquid (Stepanate [®] SXS40 ¹)	1.00
Phosphate Ester (Foamphos NP-6 ²)	2.50
C Sodium hydroxide (50% Solution)	30.00

Procedure:

1. Prepare Part A by dry blending the **VEEGUM T** and **VANZAN**, then slowly sift the blend into an established vortex (or add sequentially). Mix at maximum available shear until the **VEEGUM T** is fully hydrated.
2. Reduce mixing speed and, in the order listed, add Part B ingredients to Part A. Mix thoroughly while avoiding air entrapment.
3. Add Part C very slowly and mix until uniform.

Directions for use:

Apply liberally with a brush to a painted metal surface. Allow to stand until the old finish is loosened from the surface (10 to 20 minutes). Remove old finish with a scraper or steel wool. Rinse surface with water.

Caution: Contains caustic. Wear skin and eye protection.

RAW MATERIAL SUPPLIERS

¹Stepan Company, Northfield, IL

²Alzo International, Inc., Sayreville, NJ

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VANDERBILT

Minerals Formula

Solvent Paint Remover No. 249

		Wt. %
A	VEEGUM® PRO Magnesium Aluminum Silicate	1.0
	Water	25.0
B	N-methyl-2-pyrrolidone	73.0
	Hydroxypropylcellulose (Klucel® M IND ¹)	1.0

Procedure:

1. Sift the **VEEGUM PRO** into an established vortex in the water. Mix at maximum available shear until the **VEEGUM PRO** is fully hydrated.
2. While mixing, slowly add the N-methyl-2-pyrrolidone in order to avoid an excessive exotherm in the batch.
3. Cool while mixing to ~30°C, then slowly sift in the Klucel M and mix until it is completely dissolved.

RAW MATERIAL SUPPLIERS

¹Ashland Specialty Ingredients, Wilmington, DE

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Klucel is a registered trademark of Hercules Inc.

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VANDERBILT

Minerals Formula

Low VOC Paint Remover No. 563

	Wt. %
A VEEGUM® PRO Magnesium Aluminum Silicate	1.0
Water	33.0
N-methyl-2-pyrrolidone	32.0
Dipropylene Glycol Methyl Ether Acetate	32.0
B Octoxynol-9 (Triton® X-100 ¹)	1.0
Hydroxypropylcellulose (Klucel® M IND ²)	1.0

Procedure:

1. Sift the **VEEGUM PRO** into an established vortex in the water. Mix at maximum available shear until the **VEEGUM PRO** is fully hydrated.
2. While mixing, slowly add the N-methyl-2-pyrrolidone in order to avoid an excessive exotherm in the batch.
3. Cool while mixing to ~30°C, then slowly add the dipropylene glycol methyl ether acetate, followed by the surfactant.
4. Slowly sift in the Klucel M and mix until it is completely dissolved. Avoid air entrapment.

RAW MATERIAL SUPPLIERS

¹Dow Chemical, Midland, MI

²Ashland Specialty Ingredients, Wilmington, DE

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VANDERBILT

Minerals Formula

Rust Removal Jelly No. 467

		Wt. %
A	VAN GEL[®] B Magnesium Aluminum Silicate	3.0
	VANZAN[®] Xanthan Gum	0.8
	Water	53.2
B	Phosphoric Acid, 50% Aqueous Solution	40.0
	Octoxynol-9 (Triton [®] X-100 ¹)	3.0

Procedure:

1. Blend the **VAN GEL B** and **VANZAN** and sift into an established vortex in the water. Mix at maximum available shear until fully hydrated.
2. Reduce the stirrer speed to produce a slight vortex and slowly add the phosphoric acid solution.
3. When all the acid has been added, add the octoxynol-9 and mix until uniform.

RAW MATERIAL SUPPLIERS

¹Dow Chemical, Midland, MI

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VANDERBILT

Minerals Formula

Fine Fabric Wash No. 560

	Wt. %
A VANZAN [®] Xanthan Gum	0.75
Water	76.52
B Disodium EDTA	0.05
Alpha Olefin Sulfonate (Witconate AOS ¹)	10.00
Sodium Laureth-2 Sulfate (Steol [®] CS-270 ²)	10.00
Lauramine Oxide (Ammonyx [®] LO ²)	2.00
DMDM Hydantoin (and) Iodopropynyl Butylcarbamate (Dantoguard [®])	0.40
Plus Liquid ³)	
C Citric Acid, 20% solution	0.28

Procedure:

1. Sift the **VANZAN** into an established vortex in water. Mix until completely dissolved.
2. Add the disodium EDTA and mix until completely dissolved. Reduce mixing speed and add the remaining Part B ingredients in the order listed, mixing after each until homogeneous. Avoid air entrapment.
3. Adjust to pH 7.5 ± 0.5 with the citric acid solution.

RAW MATERIAL SUPPLIERS

¹AkzoNobel Surface Chemistry LLC
Bridgewater, NJ

²Stepan Company, Northfield, IL

³Lonza, Inc., Allendale, NJ

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Steol is a registered trademark of Stepan Company.

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Distributed in the Interest
of Product Development

VANDERBILT

Minerals Formula

Aerosol Protective Oven Film No. 251

	Wt. %
A VEEGUM® T Magnesium Aluminum Silicate	2.9
Water	86.4
B Ethylene Oxide/Propylene Oxide Copolymer (PLURONIC® F-127 ¹)	4.3
Dimethicone, 60,000 cs (Xiameter® PMX-200 Silicone Fluid 60,000CS ²)	6.4
C Preservative	qs

Procedure:

1. Sift the **VEEGUM T** into an established vortex in the water. Mix at maximum available shear until fully hydrated.
2. Reduce the mixing speed and add the Part B and C ingredients in order, mixing after each addition until uniform.

RAW MATERIAL SUPPLIERS

¹BASF Performance Chemicals, Mount Olive, NJ

²Dow Corning Corporation, Midland, MI

TRADEMARKS

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