Vanderbilt Minerals, LLC
A Wholly Owned Subsidiary of R.T. Vanderbilt Holding Company, Inc.
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Minerals and Chemicals for Ceramics and Refractories

SILICATES

VANSIL® Wollastonite is used in ceramic wall and floor tile bodies; in glazes (matt and high gloss) and in frits for glazes and enamels; and in ceramic pigments and body stains. In refractory and electrical applications, **VANSIL** wollastonite is used in bonds for vitrified grinding wheels, in electrical insulators, and as an auxiliary flux. Established benefits include: improved green strength, minimal gassing, improved melt control, improved thermal expansion control, improved impact resistance, reduced drying time, improved surface appearance in glazes, improved transparency in glazes, prevention of bubbles when formulating leadless glazes.

PYRAX® B Pyrophyllite is used in rapid-fire ceramic wall tile bodies. It lowers firing temperature; produces low moisture expansion bodies with good craze resistance; increases thermal shock resistance; and greatly increases firing strength in vitreous bodies. **PYRAX B** promotes the development of mullite when substituted for an equivalent amount of feldspar or quartz.

PYRAX RG refractory grade pyrophyllite is used in refractory mold coatings, insulating firebrick, ceramic filters, metal pouring refractories, alumina-silica monolithic refractories, ramming mixes, gunning mixes, castable mixes and kiln car refractories.

PEERLESS® Clay, a secondary kaolin, has excellent casting and pressing qualities and is used in sanitaryware, artware, generalware, floor tile, electrical porcelain, chemical porcelain and special refractories. It is moderately coarse-grained, and imparts more plasticity to a cast piece than similar clays produced by fractionization.

DIXIE CLAY® kaolin is an extremely fine kaolin with a surface area of about 26 m^2/g vs **PEERLESS** with 16 m^2/g.

SMECTITE CLAYS

VEEGUM® T Magnesium Aluminum Silicate, water-washed white-firing smectite clay, is used as a suspending agent for glazes, as a plasticizing agent for nonplastic formulations such as high alumina, zirconia and porcelain bodies, and as a nonmigrating binder in extruded bodies.

VEEGUM CER is a mixture of **VEEGUM T** and medium viscosity sodium carboxymethylcellulose that gives optimum surface hardening of unfired ceramic glazes for safer handling of the ware. It serves as a hardener, suspending agent and viscosity stabilizer in glazes.

VEEGUM PRO is **VEEGUM T** treated with amine to improve dispersibility. It is recommended for use where a minimum amount of water is required and/or only low shear mixers are available.

VAN GEL® B Magnesium Aluminum Silicate is an economical water-washed bentonite for applications where fired color is not critical.

XANTHAN GUM

VANZAN® Xanthan Gum, supplying both thickening and yield value in aqueous compositions, is used as a suspending agent for refractory minerals in mold coatings and for frits and pigments in enamels. It is likewise used a suspending agent and adhesion promoter in ceramic glazes.

ORGANIC DISPERSING AGENTS

DARVAN® 811 Dispersant is a solution of low molecular weight sodium polyacrylate for use in vitreous and semi-vitreous bodies and in glazes. In comparison to the conventional soda ash- sodium silicate systems, it produces slips with a longer casting range, higher solids content, improved viscosity stability, fewer “soda” or “hard spots”, and significantly increased mold life. **DARVAN 811D** is the dry powder version for use in low moisture applications.

DARVAN 7-N is a solution of high molecular weight sodium polymethacrylate with the same advantages as **DARVAN 811**. It is a general purpose dispersing agent for both ceramics bodies and glazes. Slips prepared with **DARVAN 7-N** show little tendency to thicken on standing. **DARVAN 7-NS** is the dry powder version for use in low moisture applications.

DARVAN 821A is a solution of low molecular weight ammonium polyacrylate, with very low ash content. It has been successfully employed where prolonged ball milling or high shear mixing is necessary and where electrical properties are of prime concern.

DARVAN C-N is a solution of the high molecular weight ammonium polymethacrylate that has been used successfully for many years in electronic and specialty ceramic products.

*Please see user advisory on next page.

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TECHNICAL DATA

TYPICAL VALUES

	Viscosity
VEEGUM® T Magnesium Aluminum Silicate	250-800 cps / 4% Solids
VEEGUM CER	75-175 cps / 1% Solids
VEEGUM PRO	300-550 cps / 1.5% Solids
VAN GEL® B Magnesium Aluminum Silicate	300-900 cps / 4% Solids

	Viscosity
VANZAN® Xanthan Gum	1400-1600 cps / 1% Solids
VANZAN D	1400-1600 cps / 1% Solids

	Horiba Laser Diffraction PSD, µm			
	D10	**D50**	**D90**	**D95**
PYRAX® B Pyrophyllite	6	21	46	56
PYRAX RG 140	7	25	52	68
PYRAX RG 200	5	19	40	47
PEERLESS® Clay	0.3	7	30	39
DIXIE CLAY® Clay	0.2	0.6	6	10
VANSIL® W-10 Wollastonite	3	23	79	100
VANSIL W-20	3	16	44	57
VANSIL W-30	2	8	18	22
VANSIL W-40	2	7	16	19
VANSIL W-50	1	5	12	14

	PYRAX B	**PYRAX RG**	**VANSIL**	**PEERLESS Clay**	**DIXIE Clay**
Al_2O_3	17%	21%	0.7%	38%	36%
SiO_2	77%	72%	50%	45%	46%
Fe_2O_3	0.5%	1.9%	0.2%	1.0%	1.7%
TiO_2	0.2%	0.5%	<0.1%	1.5%	1.4%
CaO	<0.1%	0.1%	45%	<0.1%	<0.1%
MgO	<0.1%	0.1%	1.5%	0.2%	<0.1%
Na_2O	0.1%	0.4%	<0.1%	<0.1%	<0.1%
K_2O	1.2%	0.3%	<0.1%	0.5%	0.4%
LOI	3.6%	4.0%	1.6%	14%	14%

DARVAN® Dispersant	**Form**	**Solids**	**MW**	**pH**	**Moisture**	**Ash**	**Sodium**
Sodium Polymethacrylate							
DARVAN® 7-NS	powder	---	13,000	8.5-11.5[1]	5% max	---	---
DARVAN 7-N	liquid	25%	13,000	9.5-11.5[1]	---	---	---
Ammonium Polymethacrylate							
DARVAN C-N	liquid	25%	15,000	7.5-9.0[2]	---	<0.04%	<70 ppm
Sodium Polyacrylate							
DARVAN 811D	powder	---	3,500	6.0-9.0[2]	8% max	---	---
DARVAN 811	liquid	43%	3,500	7.0-8.0[1]	---	---	---
Ammonium Polyacrylate							
DARVAN 821A	liquid	40%	3,500	7.0-8.0[1]	---	<0.01%	<50 ppm

[1]1% solution [2]5% solution

04/14/16