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CLASS 6600

Titanium Dioxide, Pure and Reduced

6600-6609 Anatase, Pure, Not Further Subclassified

6610-6679 Rutile, Pure, Not Further Subclassified

6680-6699 Reduced Anatase and Rutile

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Pure Titanium Pigments

Number	Grade	Pigment	Surface Treatment
<u>Full Chalking</u>			
6600	Anatase	(Ti-Pure FF (Titanox A-MO (Unitane C-220	None
6611	Rutile	Titanox RA10-MO	None
66C25	Rutile	Unitane CR-250	None
<u>Semi-Chalking</u>			
6603	Anatase	(Ti-Pure YCR (Titanox AA (Unitane C-410	(0.8-1.2% Al_2O_3 plus (0.8-1.2% Sb_2O_3 for (Chalk Control
6620	Rutile	Ti-Pure R-510	(1.5-2.3% Al_2O_3 plus
6621	Rutile	Titanox RA50	(0.6-1.0% SiO_2 for
6622	Rutile	Unitane CR-540	(Chalk Control
<u>Chalk Resistant</u>			
6630	Rutile	(Ti-Pure R-510 (Titanox RANC (Unitane CR-540	(1.8-2.4% Al_2O_3 , 0.6-1.0% (SiO_2 , and 0.8-1.2% ZnO for (Chalk Resistance
<u>Color Retentive - Chalking</u>			
6608	Anatase	(Ti-Pure LOCR (Titanox AL68LO (Unitane C-310	(0.8-1.2% Al_2O_3 for (Color Retention
6640	Rutile	Ti-Pure R-110	(0.5-1.5% Al_2O_3 for
6641	Rutile	Titanox RA	(Color Retention
6642	Rutile	Unitane CR-340	
66P5	Rutile	Titanox RA(Spec.)	
66P1	Rutile	Unitane CR-342	0.7-1.2% Al_2O_3

Notes:

1. For anatase pigments, all suppliers are included in one assignment.
Ti-Pure - DuPont, Titanox - Titanium Pigments, Unitane - Calco.
2. For rutile pigments, equivalent grades are grouped together above.
3. When possible, show all equivalent assignments as alternates on formula cards.
4. Mean particle size is 0.3 microns for anatase pigments and 0.3 to 0.4 for rutile.

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Oil S-W 119.1	Relative Chalking Rate	TiO ₂ % Min.	Remarks	Bulk G/100#	Number
26-28	15	98	General Use	3.09	6600
22-24 24-25	20 20	98 98	(Rutile Equivs. of 6600; Slower (Chalk, more after yellow; (Emulsions Only	2.86 2.86	6611 66025
23-25	30	96	Use Rutile Group whenever possible	3.09	6603
22-24 22-24 22-24	60 60 60	95 95 95	General Use	2.86 2.86 2.86	6620 6621 6622
21-23	100	94	General Use	2.86	6630
21-23	20	97	Use Rutile Group whenever possible	3.09	6608
19-21 20-21 22-23 20-21 17-18	35 35 35 35	97 97 97 97	(Use where 6620 group does not (supply satisfactory gloss Restricted to V/B enamels L. A. Subst. for 6642	2.86 2.86 2.86 2.86 2.86	6640 6641 6642 66P5 66P1

Notes: (Con't.)

5. Minimum specific resistance is 8000 ohms for all above pigments.
6. Relative opacity at 20% PVC and 400 sq. ft./gallon coverage is 115 for anatase, 147 for rutile grades.
7. Rutile grades chalk more slowly than corresponding anatase grades.

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Reduced Grades (30% TiO₂-70% CaSO₄)

Number	Pigment	Oil Absorption S-W 419.1	Relative Chalking Rate	Bulk	Remarks
6680	Titanox RCHT	22-24	20	3.69	High Dry-Hiding
6681	Titanox RCHTX	21	20	3.69	Ditto 6680; finer texture
6682	Ti-Cal R27	20-21	20	3.69	Restr; M-S and W. W. Lawrence
6685	Titanox RC	21-22	100	3.69	Chalk Resistant
66L15	Titanox C-50	20		3.45	(50% TiO ₂ - 50% CaSO ₄)
66M1	Titanox C-50	20		3.45	(50% TiO ₂ - 50% CaSO ₄)

Titanium Pastes, Etc.

Number	Name	%	Titanium	%	Modifier	#/G	Bulk
66C23	RBH 6610	60	Rutile	8	1/2" RS N/C	14.74	
66F2	RBH 810				N/C	14.41	
66C16	RBH 9110 (57% NVM)				Ethyl Cel.	11.89	
66P3	RBH 5401	50	Rutile		Vynlite	12.66	
66F6	RBH P516E2B		Rutile			11.00	
66F5	CAB White Chip						5.72
66F8	Pliolite Base	65	Rutile	35	Pliolite		5.95
66F9	RBH 5400	50	Anatase	12 1/2	Vynlite VYHH		8.06
66L3	RBH C-5032	80	Rutile	20	Vynlite VYHH		4.80
66P4	RBH 5402	50	Rutile	12 1/2	Vynlite VYHH		7.90

Titanium Bases

Number	%	Titanium	NVM(Run)	#/G
BW 36	62.4	6620		15.30
BW 844	62.0	6608	70	
BW 903	61.8	6600	77.5	
BW 1236	70	6630		16.90
BW 1238	70	6630		16.90
BW 1331	57.2	6600	76.5	14.01
BW 1338	60	6608		15.18

Remarks

Titanium dioxide is produced from ilmenite ore, an iron titanate containing 35% to 60% titanium dioxide. The hydrous TiO_2 produced from ilmenite can be treated with various amounts of aluminum, antimony, silicon, and zinc oxides to control color retention and chalking resistance.

Whether anatase or rutile pigment results is dependent on the nucleation of the original liquor which largely determines the crystal structure of the hydrous TiO_2 , and partly on the conditions of calcination following the previously-mentioned metallic oxide treatment. The rutile types have the greater opacity.

In making reduced grades, a finely-divided anhydrous $CaSO_4$ is added prior to hydrolysis. The hydrous TiO_2 is precipitated by hydrolysis on the extender to which it is tightly held, resulting in a true composite rutile pigment.

6600 Full chalking anatase. A general purpose pigment where full-chalking is desired or not harmful. Primary use is in exterior house paints.

6611) Full chalking rutile grades analogous to 6600, used almost exclu-
66025) sively for emulsion paints. Although a greater hiding power is attainable in house paints, use of 6600 results in earlier chalking and greater whitening.

6603 Semi-chalking anatase. Useful to obtain balanced chalking rate and for architectural white enamels. Use of the rutile group below (6620-6621-6622) is preferred.

6620) Semi-chalking rutile grades analogous to 6603. The most versatile
6621) TiO_2 used, its use is recommended except where maximum chalking or
6622) maximum chalk resistance is imperative.

6630 Non-chalking rutile grades. General use is in exterior tinted enamels, lacquers and paints, and in interior-exterior enamels.

6608 Color-retentive chalking anatase. Modified for minimum discoloration and after-yellowing, especially with synthetic resins, it is of primary use in baking finishes. Although whiteness of 6608 is higher, use of the more efficient rutile group (6640-6641-6642) is recommended.

6640) Color-retentive chalking rutile grades analogous to 6608. Modified
6641) for minimum discoloration and after-yellowing, especially with syn-
6642) thetic resins, these represent the maximum gloss, opacity, whiteness, brightness, and color stability attainable with rutile TiO_2 . They are particularly adaptable to baking finishes. Exterior use is not general since chalking may not be sufficient to insure acceptable removal of dirt collection.

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Remarks (Con't.)

- 6680 A high water-sensitive reduced pigment used to modify chalking of 6600, and where dry-hiding is required.
- 6681 A finer-textured, lower oil absorption version of 6680.
- 6682 A low water-sensitive, low wet-dry-hiding reduced pigment useful to obtain low angular sheens, or where high humidity results in high consistency.
- 6685 A non-chalking, fade-resistant reduced pigment for exterior enamels and paints.

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