



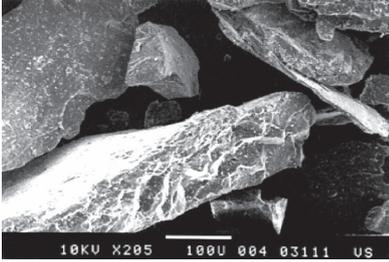
Plastorit[®] 00 and Plastorit[®] 000

Improved scrub resistance in interior decorative paints

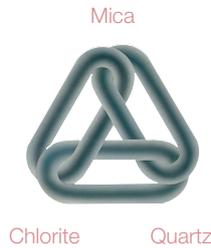
- Enhanced scrub resistance
- Increased matting effect
- Cost-effective solution

Introduction

Plastorit® products are derived from the mineral leucophyllite, a unique coalescence of chlorite, mica and quartz.



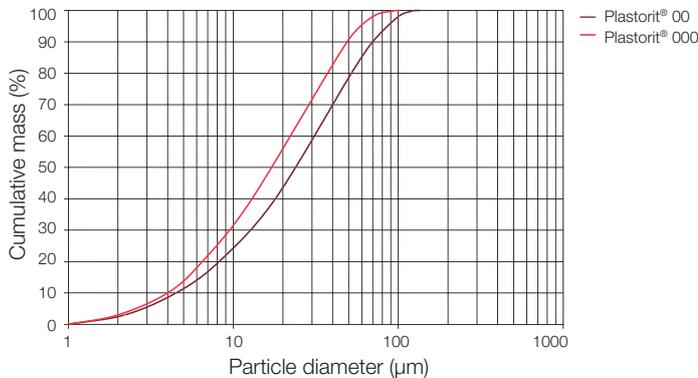
Leucophyllite



This natural coalescence of three minerals provides specific properties to the paint formulation which could not be obtained with each mineral individually. The combination of lamellar chlorite and mica particles with the nodular shaped quartz particles provides excellent scrub resistance and matting in decorative coatings.

We particularly recommend our coarse grades Plastorit® 00 and Plastorit® 000 for this application.

Particle size distribution, Malvern laser (Fig. 1)



Performance in interior decorative paints

Formula

The advantages of Plastorit® have been demonstrated in coalescent-free interior matt decorative paints over a PVC range of 75.8% to 86.0%. Jetfine® 1 A, an ultrafine, high brightness talc from Imerys Talc was included in the formulation for its TiO₂ extender effect and to increase the dry hiding.

Paint components (Weight %)	Formula without Plastorit®					Formula with Plastorit® 00 or 000				
	33.0	33.7	34.4	35.3	36.0	33.0	33.7	34.4	35.3	36.0
Water + additives	33.0	33.7	34.4	35.3	36.0	33.0	33.7	34.4	35.3	36.0
TiO ₂ , Rutile	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
ImerCarb™ 2L	21.0	21.4	21.8	22.1	22.5	21.0	21.4	21.8	22.1	22.5
ImerCarb™ 5L	21.5	21.9	22.3	22.6	23.0	16.5	16.9	17.3	17.6	18.0
Plastorit® 00 or Plastorit® 000	0.0	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0
Jetfine® 1 A	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vinyl acetate copolymer, MFT 0°C, 53% solids	13.0	11.5	10.0	8.5	7.0	13.0	11.5	10.0	8.5	7.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
PVC (%)	75.8	78.2	80.7	83.3	86.0	75.8	78.2	80.7	83.3	86.0
CPVC (%)	63.3	63.4	63.5	63.5	63.6	62.2	62.2	62.3	62.4	62.5
Ratio	1.20	1.23	1.27	1.31	1.35	1.22	1.26	1.29	1.33	1.38
Density (g/ml)	1.62	1.63	1.64	1.65	1.67	1.62	1.63	1.64	1.65	1.67
Solids by weight (%)	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5
Solids by volume (%)	39.3	38.9	38.5	38.1	37.7	39.3	38.9	38.5	38.1	37.7

(Table 1)

Scrub resistance

The scrub resistance of the formulations in Table 1 was analysed in accordance with ISO 11998.

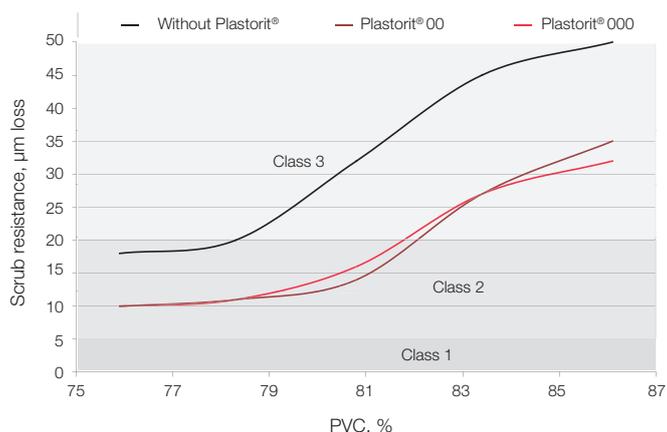
Scrub resistance, μm loss (Table 2)

PVC %	Without Plastorit®	Plastorit® 00	Plastorit® 000
75.8%	18	10	10
78.2%	20	11	11
80.7%	32	14	16
83.3%	45	27	27
86.0%	50	35	32

Class 2: Loss ≥ 5 to $< 20\mu\text{m}$	Class 3: Loss ≥ 20 to $< 70\mu\text{m}$
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The results as shown in Table 2 and Figure 2 demonstrate that partially replacing the coarse ($5\mu\text{m}$) carbonate with Plastorit® improves scrub resistance significantly. Using Plastorit® in the formula allows paint formulators to lower resin content by +/-25%, while maintaining the same scrub resistance performance.

Scrub resistance ISO 11998 (Fig. 2)

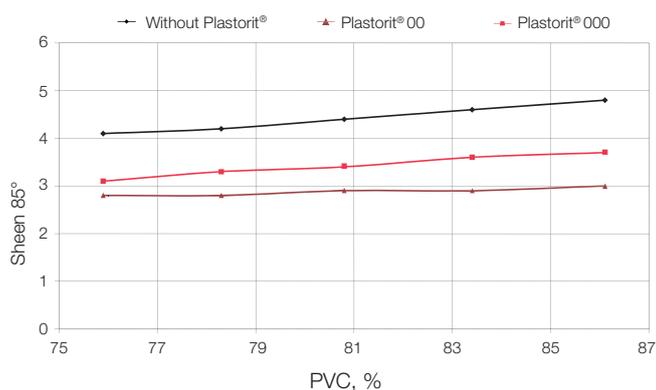


Sheen 85°

Sheen (Fig 3.) is measured on dried paint films applied on Leneta charts at $100\mu\text{m}$ wet film thickness.

Both Plastorit® 00 and Plastorit® 000 reduce sheen levels, making them ideal matting agents for decorative paints.

Low angular sheen 85° (Fig. 3)



Optimized formulation and cost savings

Table 3 shows the overall performance of the paints at equal scrub resistance.

Plastorit® 00 and Plastorit® 000 allow manufacturers to formulate at higher PVC levels without sacrificing scrub performance. They can also be used to lower sheen and increase opacity, as well as to reduce resin levels leading to raw materials cost savings.

Overall performance at equal scrub resistance (Table 3)

Formula (Weight %)	Without Plastorit®	Plastorit® 00	Plastorit® 000
Water + additives	33.0	34.4	34.4
TiO ₂ , Rutile	8.5	8.5	8.5
ImerCarb™ 2L	21.0	21.8	21.8
ImerCarb™ 5L	21.5	17.3	17.3
Plastorit® 00	0.0	5.0	0.0
Plastorit® 000	0.0	0.0	5.0
Jetfine® 1 A	3.0	3.0	3.0
Vinyl acetate copolymer, MFT 0°C, 53% solids	13.0	10.0	10.0
TOTAL	100.0	100.0	100.0
PVC (%)	75.8	80.7	80.7
CPVC (%)	63.3	62.3	62.3
Ratio	1.20	1.29	1.29
Density (g/ml)	1.62	1.64	1.64
Solids by weight (%)	60.5	60.5	60.5
Solids by volume (%)	39.3	38.5	38.5

Paint properties	Without Plastorit®	Plastorit® 00	Plastorit® 000
Dry opacity Yb/Yw (100 μm wet)	94.0	94.8	96.3
Sheen 85° (100 μm wet)	4.1	2.9	3.4
Brightness Y (EN13300)	91.1	90.4	90.7
Scrub resistance (loss μm)	18	14	16
Scrub resistance (class)	2	2	2
Cost saving per litre		1.8%	1.3%
Cost saving per kg		3.0%	2.5%

Conclusion

The unique mineralogical composition of Plastorit® 00 and Plastorit® 000 provides paint formulators with a cost effective solution for achieving high scrub resistance and improved matt effect in decorative paints.



About Imerys Talc

Imerys Talc is the world's leading talc producer, employing 1,000 people on five continents and supplying around 15 percent of world demand from our mines and processing plants in Australia, Austria, Belgium, Canada, France, Italy, Japan, Spain and the United States.

We are the acknowledged leaders in product quality, supply reliability and technical support – the services that create value for our customers and set us apart from competitors.

With over a hundred year's experience in the extraction and processing of talc, we offer the highest quality talc products on the market today.

About Talc

Talc is a surprisingly versatile, functional mineral which possesses a unique combination of properties. Talc is soft, water repellent, chemically inert and highly platy and has a marked affinity for certain organic chemicals. Our industry experts have harnessed these properties to bring customers improved performance in a wide range of applications such as paper, paints, plastics, rubber, ceramics, agriculture, food, pharmaceuticals, cosmetics and soap.

Meeting today's needs. Securing tomorrow's.

We believe that running a successful business and sustaining quality of life and the environment go hand in hand. From implementing behavior-based safety training to rehabilitating the land, we think it's important that future generations' needs are not compromised by our actions today.

Our fundamental sustainability principles are:

- **Safety** - We promote the health and safety of employees, contractors, customers, neighbors and consumers through active caring.
- **Partnership** - We seek to understand the issues that are important to our neighbors, and to make a lasting contribution to the communities in which we operate.
- **Environmental protection** - We work to minimize our environmental footprint by using natural resources efficiently, preventing pollution, complying with applicable laws and regulations and continually improving our performance.
- **Accountability** - We conduct business in an accountable and transparent manner, relying on external auditing and reporting to understand and reflect our stakeholders' interests.
- **Product stewardship** - We are committed to ensuring that our products are safe for people and the environment, employing best available technology and following best-in-class procedures to ensure that our standards and practices meet or exceed safety requirements everywhere we do business.



We conduct life cycle assessments (LCA) at all our operations to quantify the environmental effects associated with producing our products from the mine to factory gate, and to identify areas for improvement.

Likewise, we compile life cycle inventories (LCI) of the energy consumption, materials used and emissions generated by each of our product ranges. These LCI can be made available to customers and research institutions on request.