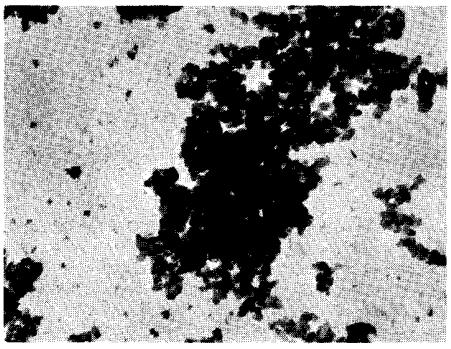
C.T.S. ESPAÑA
Productos y Equipos para la Restauración, S.L.
C/. Monturiol, 9 - Pol. Ind. San Marcos
28906 GETAFE (Madrid)
Tel.: +34 91 601 16 40 (4 líneas) - Fax: +34 91 601 03 33
www.ctseurope.com · E-mail: cts.espana@ctseurope.com

# SILICE MICRONIZZATA LO-VEL® 27

***Lo-Vel® 27 silica is a highly efficient flatting agent designed to reduce the gloss of lacquers and other coatings that require Hegman readings of 6 to 6½. Lacquer films made with Lo-Vel 27 flatting agent are notable for their freedom from white specks and streaks. The PPG production process assures excellent smoothness and freedom from coarse particles.***

***Being relatively inert, Lo-Vel 27 flatting agent works well with any color. It will not abrade spray tips or equipment. Since it is a hydrated silica, Lo-Vel 27 is ideal for water-based systems. Yet the cost to achieve a given gloss level as well as the cost per pound of Lo-Vel 27 silica is less than that of comparable flatting agents.***

***Dispersion Versatility***—The agglomerates of precipitated silicas, such as Lo-Vel 27, are not so tightly bonded as those of gels and disperse easily. Lo-Vel 27 flatting agent can be dispersed by any means desired because of its ease of dispersion and satisfactory resistance to overdispersion. Low-energy dispersion of Lo-Vel 27 silica flatting agent can be successfully achieved in ten minutes of propeller agitation by adding the dry silica to the final lacquer formula. If fast dispersion is desired, a high-speed mixer can be used. A universal flatting paste can be prepared by dispersing Lo-Vel 27 flatting agent in a common solvent such as toluene or methyl ethyl ketone.



***Silica pigments are widely used for flatting clear wood finishes.***

***Comparative Flatting Efficiency In Vinyl Topcoat Lacquer***
(8% flatting agent based on resin solids)

| *Low Shear Dispersion With Cowles Impeller* | *Lo-Vel 27 Flatting Agent* | *Hydrogel Silica Flatting Agent* |
|---|---|---|
| Hegman Reading | 6 | 6 |
| 60° Gloss | 12 | 16 |
| Clarity | clear | clear |

| *8 Hours in Ball Mill* | *Lo-Vel 27 Flatting Agent* | *Hydrogel Silica Flatting Agent* |
|---|---|---|
| Hegman Reading | 7¼ | 7 |
| 60° Gloss | 20 | 18 |
| Clarity | clear | clear |

***Easy Resuspension in Containers***—Lo-Vel 27 is not surface-treated but can be easily resuspended after several months' storage in clear lacquers and varnishes by the use of solvents such as the lower alcohols and glycol ethers.

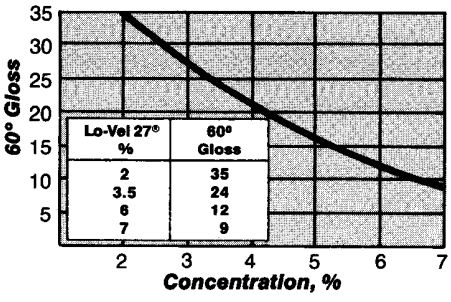
Hydrogen bonding solvents, especially the lower alcohols, enhance the flatting efficiency of Lo-Vel 27. A methanol/Lo-Vel 27 ratio of 9:1 in a nitrocellulose lacquer gives a 60° gloss of 10 versus 19 without methanol.

Easy resuspension can also be achieved by using Lo-Vel 66, which is Lo-Vel 27 treated with wax, or by adding wax separately.

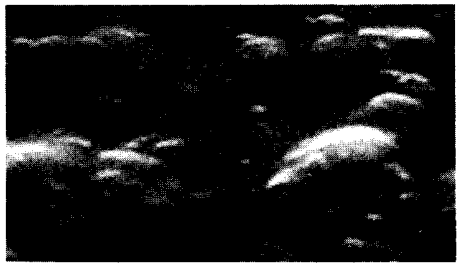
Another option for easy resuspension is the use of Bentone[1] SD-1 antisettling agent in aliphatic solvent coating systems.

[1]Registered trademark of N L Industries, Inc.

***Flatting Efficiency in Nitrocellulose Lacquers***




***The percent concentration of Lo-Vel 27 flatting agent is based on nitrocellulose lacquer resin solids. The dry silica was added to the final lacquer formula by the direct stir-in technique—stirring for ten minutes at 1,000 rpm.***



***Electron micrograph, taken at 60°, of nitrocellulose lacquer film containing Lo-Vel 27 flatting agent, 6% based on resin solids.***

## Uses

Lo-Vel 27 flatting agent can be used in a variety of low-gloss finishes such as furniture lacquers and topcoat lacquers for vinyl fabrics. Lo-Vel 27 flatting agent can also be used in pigmented metal finishes where a Hegman reading of 6 to 6½ is desired such as medium-gloss coil coatings and metal office furniture finishes.

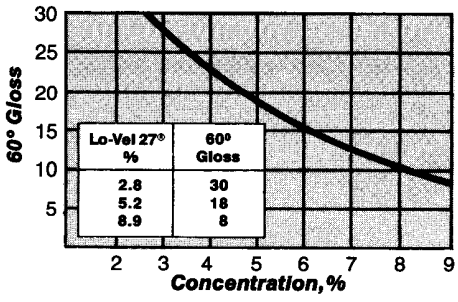
## Grades and Forms

PPG Industries produces a line of flatting agents:

| *Grade* | *Primary Use* |
|---|---|
| Lo-Vel 27 | vinyl topcoat lacquer |
| Lo-Vel 66 | nitrocellulose lacquer |
| Lo-Vel 275 | coil coatings, varnishes, general purpose |
| Lo-Vel 28 | coil coatings, Hegman 5½ |
| Lo-Vel 29 | coil coatings, Hegman 5 |
| Lo-Vel 39A | micro-texture finishes |
| Lo-Vel HSF | high solids coatings |

All Lo-Vel silicas have the same physical and chemical properties, except for their agglomerate size distribution.

***Flatting Efficiency in Vinyl Lacquers***




***The percent concentration of Lo-Vel 27 flatting agent is based on vinyl lacquer resin solids. The dry silica was added to the final lacquer formula by the direct stir-in technique—stirring for ten minutes at 1,000 rpm.***



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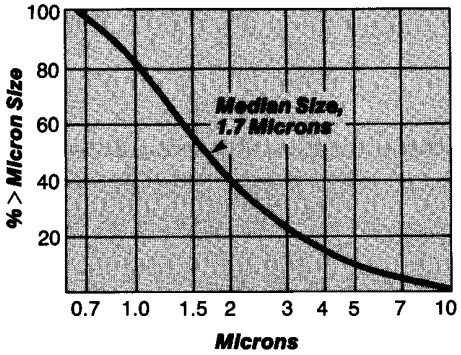


***Agglomerate size distribution as determined by a PPG test method using Coulter Counter Model TAII at a 30-micron aperture.***

## Health Effects

Lo-Vel 27 silica can absorb considerable oil or moisture. Persons who have had prolonged contact with the powder or dust may feel a drying effect on their hands or other exposed areas of the body due to absorption of moisture and oils. Discontinuing contact with the powder or dust permits the dry skin or mucous membranes to return to normal condition.

Persons who handle silica powders on a prolonged or frequent basis should wear cotton gloves to prevent skin drying. Gloves should be made of closely woven cotton fabric, and should be washed and changed frequently.

Synthetic silica powders are not calcined during manufacture, and are amorphous rather than crystalline. There is no detectable crystalline silica (detection limit 0.01%) in Lo-Vel 27. The current OSHA limits (29CFR 1910.1000, March 1, 1989) for amorphous silica containing less than 1% crystalline silica are 6 mg/m³. Persons exposed to dust concentrations exceeding the above limits should wear a NIOSH/MSHA-approved mechanical filter respirator.

For additional information refer to the Material Safety Data Sheet for this product.

## Handling and Storage

Bags of Lo-Vel 27 silica flatting agent are handled the same as bags containing other inert materials. Storing the bottom bags of a pallet load compressed for prolonged periods may cause excessive agglomeration. This can be eliminated by storing bags upright.

## Packaging and Shipping

Shipments of Lo-Vel 27 flatting agent are made from the PPG Industries plant in Barberton, Ohio.

The bags (36″ x 21″ x 6″) are multiwall, kraft paper and hold 20 pounds. Packaged shipments can be made in trucks or rail cars.

The shipping classification of Lo-Vel flatting agents is: Silica, NOIBN.

## Samples and Service

Samples of Lo-Vel 27 flatting agent are available on request.

Paint technologists at the PPG Industries technical center specialize in the uses of Lo-Vel 27 flatting agent. They are prepared to provide formulations and assistance to customers.

## Typical Properties

Lo-Vel 27 flatting agent is an amorphous, synthetic silica having the form of a dry white powder.

| | |
|---|---|
| ***CAS Registry No. 63231-67-4*** | |
| ***Median Agglomerate Size, microns*** | 2.0 |
| ***Average Ultimate Particle Size, microns*** | 0.019 |
| ***Surface Area, square meters/gram*** | 180 |
| ***Oil Adsorption, pounds/100 pounds*** | 210* |
| ***pH of 5% Solution at 25°C*** | 6.5-7.3 |
| ***Ignition Loss at 1000°C, %*** | 10.0 |
| ***Loss from 105°C to 1000°C, %*** | 3.7 |
| ***Loss at 105°C, %*** | 6.3 |
| ***Silanol Group Density:*** | |
| ***OH-groups per square millimicron*** | 8.0 |
| ***Surface Covered, %*** | 100 |
| ***Equilibrium Moisture Content, %:*** | |
| ***At 50% relative humidity*** | 7.2 |
| ***At 70% relative humidity*** | 10 |
| ***At 90% relative humidity*** | 20 |
| ***Refractive Index*** | 1.455 |
| ***Bulk Density, pounds/cubic foot*** | 2-4 |
| ***Specific Gravity*** | 2.1 |
| ***Density, pounds/gallon*** | 17.5 |
| ***Bulking Value, gallons/100 pounds*** | 5.8 |
| ***Wet Sieve Residue, %, 325 mesh, per ASTM Method D-154*** | 0. 002 |

## Typical Analysis, %

| | |
|---|---|
| ***$SiO_2$, anhydrous basis*** | 97.5 |
| ***$SiO_2$, as shipped*** | 87.1 |
| ***$Fe_2O_3$*** | 0.1 |
| ***$Al_2O_3$*** | 0.6 |
| ***$TiO_2$*** | 0.07 |
| ***CaO*** | 0.5 |
| ***MgO*** | 0.2 |
| ***$Na_2SO_4$*** | 1.5 |

*Oil adsorption tests are run using Di-Butyl Phthalate.

Statements and methods presented are based upon the best available information and practices known to PPG Industries at present, but are not representations or warranties of performance, result or comprehensiveness, nor do they imply any recommendations to infringe any patent or an offer of license under any patent.

The products mentioned herein can be hazardous if not used properly. Any health hazard and safety information contained herein should be passed on to your customers or employees, as the case may be. PPG Industries also recommends that, before use, anyone using or handling this product thoroughly read and understand the information and precautions on the label, as well as in other product safety publications such as the Material Safety Data Sheet.

Like all potentially hazardous materials, this product must be kept out of the reach of children.

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