

## Calcined Aluminas for Polishing



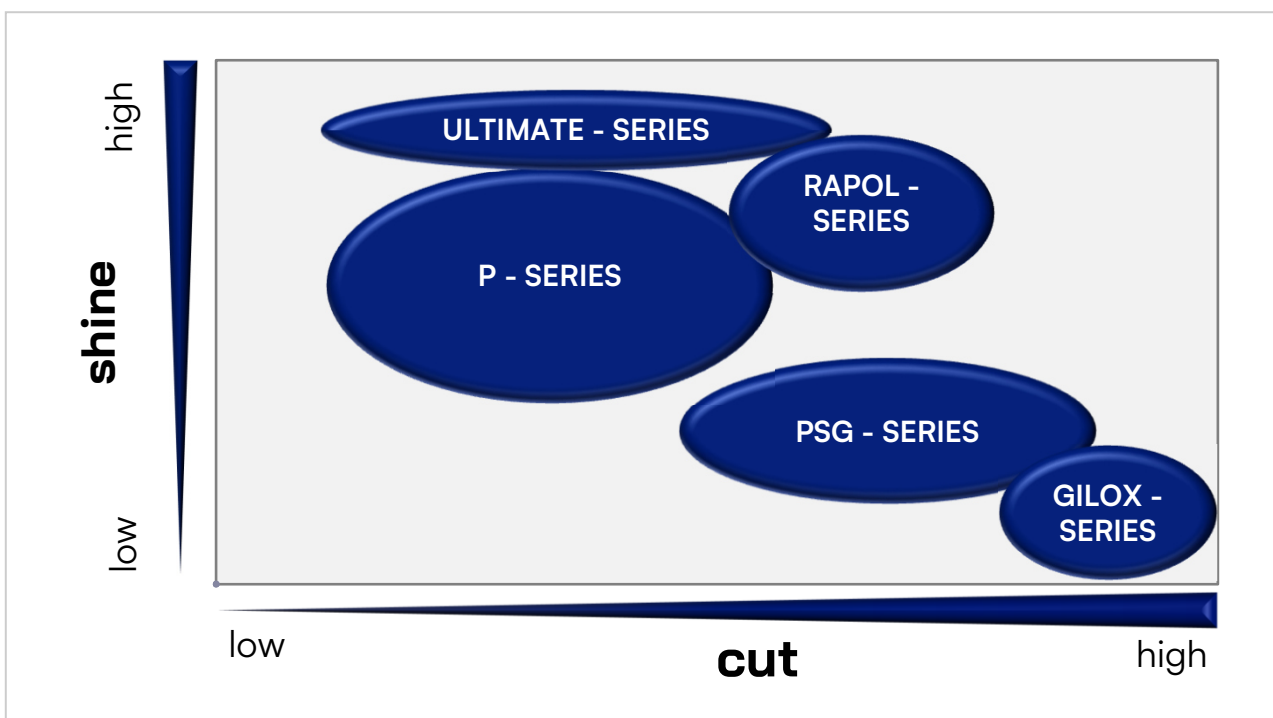


# Calcined Aluminas for Polishing

## Product Description

Alumina is one of the most important abrasive materials for polishing a wide range of surfaces. Considering the diverse customer needs for different applications, Almatis strives to find premium solutions to enable our customers to combine highest cutting rates and brilliant finishing results.

Almatis offers the broadest polishing portfolio in the industry and with this wide selection we offer the most efficient solution for each customer's specific need.



| APPLICATION         | ULTIMATE - SERIES | P - SERIES | RAPOL - SERIES | PSG - SERIES | GILOX - SERIES |
|---------------------|-------------------|------------|----------------|--------------|----------------|
| Metal pre-polishing |                   | X          |                | X            | X              |
| Metal finishing     | X                 | X          |                | X            |                |
| Aluminum            |                   | X          |                | X            | X              |
| Plastic/Paint/Resin | X                 | X          | X              |              |                |
| Wood                |                   | X          |                |              |                |
| Stones              |                   | X          |                | X            | X              |
| Electronics         |                   |            |                |              | X              |
| Cleaners            | X                 | X          | X              |              |                |
| Brake pads          |                   | X          |                | X            | X              |
| Jewelry             | X                 | X          | X              |              |                |

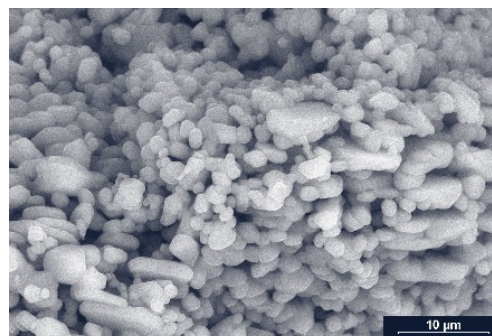


# Calcined Aluminas for Polishing

## PSG-Series

Metal polishing is the largest polishing application for Almatris premium aluminas. To achieve high surface quality, A two-step approach is suggested. For the pre-polishing step, Almatris supplies a hard calcined PSG series with surface areas  $<1.1\text{m}^2/\text{g}$  and clearly defined top cuts.

The goal of pre-polishing operations is to achieve the highest possible abrasiveness together with a well-prepared surface. High performance pre-polishing compounds reduce the time and cost necessary for the final polishing steps by providing a surface with low roughness values.



SEM PSG-Series

| Chemical Composition                         | Unit                | Typical (All Products) |            |            |           |           |           |
|--|---------------------|------------------------|------------|------------|-----------|-----------|-----------|
| Al <sub>2</sub> O <sub>3</sub> by difference | [%]                 | 99.7                   |            |            |           |           |           |
| Na <sub>2</sub> O                            | [%]                 | 0.1                    |            |            |           |           |           |
| SiO <sub>2</sub>                             | [%]                 | 0.02                   |            |            |           |           |           |
| <b>Calcination Degree</b>                    |                     | high                   |            |            |           |           |           |
| Primary Crystal Size                         | [μm]                | 3                      |            |            |           |           |           |
| α- Al <sub>2</sub> O <sub>3</sub> Content    | [%]                 | 99                     |            |            |           |           |           |
| Particle Size                                |                     | PSG 100                | PSG 125    | PSG 140    | PSG 180   | PSG 200   | PSG 300   |
| ≥ 425 μm / 35 mesh                           | [%]                 | 0                      | 0          | 0          |           |           |           |
| ≥ 200 μm / 65 mesh                           | [%]                 | ≤ 1                    |            |            | 0         |           |           |
| ≥ 125 μm / 120 mesh                          | [%]                 |                        | ≤ 4        | ≤ 0.5      |           | ≤ 0.5     |           |
| ≥ 90 μm / 170 mesh                           | [%]                 |                        |            | ≤ 5        |           |           |           |
| ≥ 63 μm / 250 mesh                           | [%]                 | 50 - 95                | 30 - 60    | 10 - 35    |           | 3 - 15    |           |
| ≥ 45 μm / 325 mesh                           |                     |                        |            |            | 20 - 40   |           | ≤ 1       |
| D50 Typical                                  | [μm]                | 75                     | 60         | 50         | 10        | 6         | 4.5       |
| <b>Physical Properties</b>                   |                     |                        |            |            |           |           |           |
| Specific Surface Area                        | [m <sup>2</sup> /g] | ≤ 0.7                  | ≤ 0.7      | ≤ 0.7      | ≤ 1.0     | ≤ 1.0     | ≤ 1.1     |
| Loose Bulk Density                           | [g/l]               | 800 - 1050             | 800 - 1050 | 700 - 1000 | 700 - 950 | 760 - 950 | 550 - 900 |
| Oil Absorption                               | [%]                 | 41 - 54                | 35 - 50    | 35 - 50    | Dec-25    | 14 - 25   | 12 - 22   |

All data are based upon Almatris standard test methods and published as typical or range limits. All test methods are available upon request.



# Calcined Aluminas for Polishing

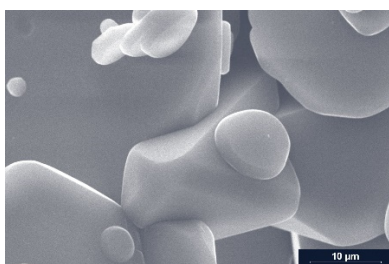
## GILOX-Series

For applications targeting for very high cut Almatis products of the GILOX-Series are the right solution. By manipulating crystal size and shape using different processing routes, Almatis can offer a wide range of products with unique cut rates. Another specialty is the transparency and plate-like structure of our products P 20 and P 25, which stay stable during milling process and can be used in special polishing applications as well as wear resistant coatings.

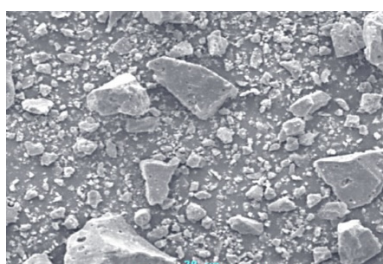
| Chemical Composition                         | Unit                | PBC        | P 20       | P 25       | GILOX 125 | GILOX 63  | T60/T64<br>-45 micron |
|--|---------------------|------------|------------|------------|-----------|-----------|-----------------------|
| Al <sub>2</sub> O <sub>3</sub> by difference | [%]                 | ≥ 99.5     | ≥ 99.5     | ≥ 99.5     | ≥ 99.5    | ≥ 99.5    | ≥ 99.5                |
| Na <sub>2</sub> O                            | [%]                 | 0.1        | 0.3        | 0.35       | 0.35      | 0.35      | 0.3                   |
| SiO <sub>2</sub>                             | [%]                 | 0.02       | 0.03       | 0.03       | 0.03      | 0.03      | 0.05                  |
| Calcination Degree                           |                     | high       | very high  | very high  | very high | very high | very high             |
| Primary Crystal Size                         | [µm]                | 4.5        | 18         | 22         | 15        | 15        |                       |
| α- Al <sub>2</sub> O <sub>3</sub> Content    | [%]                 |            |            |            | 99        |           |                       |
| <b>Particle Size</b>                         |                     |            |            |            |           |           |                       |
| ≥150 µm / 100 mesh                           | [%]                 | ≤ 3        |            |            |           |           |                       |
| ≥ 125 µm / 120 mesh                          | [%]                 |            |            |            | ≤ 1       |           |                       |
| ≥ 90 µm / 170 mesh                           | [%]                 |            |            |            |           |           |                       |
| ≥ 63 µm / 250 mesh                           | [%]                 | 40 - 90    | 50 - 80    | 55 - 90    | 5 - 12    | 0.1 - 3   | ≤ 1                   |
| ≥ 45 µm / 325 mesh                           | [%]                 |            |            |            |           |           | ≤ 5                   |
| D50 Typical                                  | [µm]                | 65         | 15*        | 25*        | 22        | 17        | 8                     |
| <b>Physical Properties</b>                   |                     |            |            |            |           |           |                       |
| Specific Surface Area                        | [m <sup>2</sup> /g] | 0.3 - 0.45 | 0.15       | 0.15       | 0.2       | 0.2       |                       |
| Loose Bulk Density                           | [g/l]               | 800 - 1100 | 600 - 1100 | 600 - 1100 |           |           |                       |
| Oil Absorption                               | [%]                 | 35 - 50    | 20 - 60    | 25 - 65    | 15 - 30   | 10 - 25   |                       |

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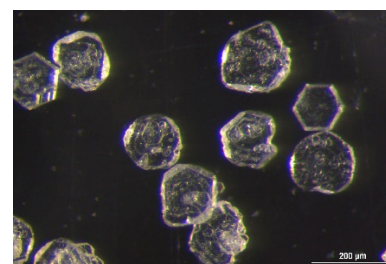
\*de-agglomerated



SEM of P 25



SEM of Tabular Alumina T60/T64  
-45 micron



Transparency of P 25 crystals



# Calcined Aluminas for Polishing

## P-Series

For finishing of all kinds of surfaces, Almatis supplies a broad portfolio with unique performance in the 9-17 m<sup>2</sup>/g surface area range. Almatis can offer optimum cutting solutions, as well as polishing and brightening, for customer specific needs.

| Chemical Composition                         | Unit                | All Sizes (Typicals) |           |           |           |           |           |           |             |
|--|---------------------|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|
| Al <sub>2</sub> O <sub>3</sub> by difference | [%]                 | ≥ 99.5               |           |           |           |           |           |           |             |
| Na <sub>2</sub> O                            | [%]                 | 0.4                  |           |           |           |           |           |           |             |
| SiO <sub>2</sub>                             | [%]                 | 0.01                 |           |           |           |           |           |           |             |
| Calcination Degree                           |                     | low                  |           |           |           |           |           |           |             |
| Primary Crystal Size                         | [µm]                | ≤ 1                  |           |           |           |           |           |           |             |
| α- Al <sub>2</sub> O <sub>3</sub> Content    | [%]                 | ≥ 70                 |           |           |           |           |           |           |             |
| Particle Size                                |                     | P 6                  | P 02      | P 2       | P 2 FR    | P 30      | P 2 S     | P 730     | P 10 feinst |
| ≥ 125 µm / 120 mesh                          | [%]                 | ≤ 5                  |           |           |           |           |           |           |             |
| ≥ 90 µm / 170 mesh                           | [%]                 |                      | ≤ 1       | ≤ 0.5     | ≤ 0.5     | ≤ 0.1     |           |           |             |
| ≥ 71 µm / 200 mesh                           | [%]                 |                      |           |           |           |           | ≤ 0.1     |           |             |
| ≥ 63 µm / 250 mesh                           | [%]                 | 15 – 40              | 1.0 – 15  | 0.1 – 5   | ≤ 1.5     | 0.1 – 3   | 0.1 – 3   |           |             |
| ≥ 56 µm / 270 mesh                           | [%]                 |                      |           |           |           |           |           | ≤ 0.1     |             |
| ≥ 45 µm / 325 mesh                           | [%]                 |                      |           |           |           |           |           |           |             |
| ≥ 40 µm / 400 mesh                           | [%]                 |                      |           |           |           |           |           | ≤ 3       | ≤ 0.1       |
| ≥ 20 µm / 625 mesh                           | [%]                 |                      |           |           |           |           |           |           | ≤ 3         |
| D50 Typical                                  | [µm]                | 33                   | 16        | 11        | 24        | 8.3       | 9         | 3.7       | 3           |
| Physical Properties                          |                     | P 6                  | P 02      | P 2       | P 2 FR    | P 30      | P 2 S     | P 730     | P 10 feinst |
| Specific Surface Area                        | [m <sup>2</sup> /g] | 9 - 17               |           |           |           |           |           |           |             |
| Loose Bulk Density                           | [g/l]               | 700 - 1000           | 640 - 740 | 500 - 800 | 650 - 850 | 500 - 800 | 500 - 800 | 400 - 600 | 350 - 550   |
| Oil Absorption                               | [%]                 | 37 - 47              | 36 - 46   | 35 - 45   | 40 - 50   | 30 - 40   | 35 - 45   | 30 - 40   | 30 - 40     |

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APPLICATION: Resin-Polishing



APPLICATION: Metal-Polishing



APPLICATION: Pre-Metal-Polishing

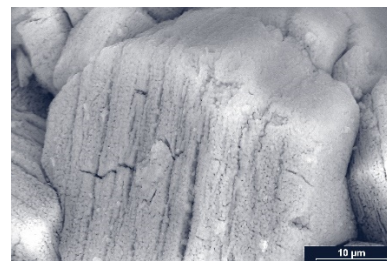


# Calcined Aluminas for Polishing

## RAPOL-Series

Aluminum oxide is the most widely used polishing medium. As a synthetic inorganic product, it has one important advantage over natural materials used for polishing: the physical properties and chemical compositions are constant regardless of the pressure or temperature experienced during use.

The RAPOL range is especially designed for one step polishing processes, which gives "rapid" cutting and shiny polishing performance. The product enables our customers to offer cost efficient solutions for their end user.



SEM of RAPOL-Series

| Chemical Composition                         | Unit                | All Sizes (Typicals) |            |                  |           |           |
|--|---------------------|----------------------|------------|------------------|-----------|-----------|
| Al <sub>2</sub> O <sub>3</sub> by difference | [%]                 | ≥ 99.5               |            |                  |           |           |
| Na <sub>2</sub> O                            | [%]                 | 0.1                  |            |                  |           |           |
| SiO <sub>2</sub>                             | [%]                 | 0.02                 |            |                  |           |           |
| <b>Calcination Degree</b>                    |                     |                      |            |                  |           |           |
| Calcination Degree                           |                     | low                  |            |                  |           |           |
| Primary Crystal Size                         | [μm]                | ≤ 1                  |            |                  |           |           |
| α- Al <sub>2</sub> O <sub>3</sub> Content    | [%]                 | ≥ 70                 |            |                  |           |           |
| Particle Size                                |                     | RAPOL 100            | RAPOL 140  | RAPOL 500        | RAPOL 600 | RAPOL 900 |
| ≥ 125 μm / 120 mesh                          | [%]                 | ≤ 0.5                |            |                  |           |           |
| ≥ 90 μm / 170 mesh                           | [%]                 |                      | ≤ 5        | ≤ 0.5            |           | ≤ 0.0     |
| ≥ 63 μm / 250 mesh                           | [%]                 | 50 - 95              | 10 - 45    | 0.1 – 5.0        | ≤ 0.1     |           |
| ≥ 45 μm / 325 mesh                           | [%]                 |                      |            |                  | ≤ 1       | ≤ 0.6     |
| D50 Typical                                  | [%]                 | 70                   | 50         | 11               | 5         | 0.8       |
| <b>Physical Properties</b>                   |                     |                      |            |                  |           |           |
| Specific Surface Area                        | [m <sup>2</sup> /g] | 3.5 – 4.5            | 3.5 – 4.5  | <b>4.0 – 8.0</b> | 4.0 – 8.0 | 5.0 – 9.0 |
| Loose Bulk Density                           | [g/l]               | 800 – 1200           | 800 – 1200 | 500 – 900        | 350 - 650 | 300 – 650 |
| Oil Absorption                               | [%]                 | 40 - 60              | 35 - 50    | 30 – 40          | 25 - 35   | 10 - 25   |

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# Calcined Aluminas for Polishing

## ULTIMATE-Series

Automobile paints are typically two-component systems, as these protect the vehicle better against UV light and abrasion. The alumina used in the polishing emulsion should provide high cut and perfect finish to the clear coat. Almatis ULTIMATE P 815 is an economic and efficient product, giving good cut and polish. For high-end, scratch-free finishing, ULTIMATE P 2500 is the leading product in our portfolio.

In marine applications there are special requirements for the gel coat. Gel coats are very hard, modified resins that provide gloss and protect the fiberglass structure against ultraviolet degradation and hydrolysis. Polishing compounds need an aggressive cut and in parallel a good polishing performance, to achieve a smooth surface. Almatis offers specially designed aluminas for gel coat polishing, such as ULTIMATE P 1500, the best performing powder for that application.

| Chemical Composition                         | Unit                | All Sizes (Typical) |                 |                 |
|--|---------------------|---------------------|-----------------|-----------------|
| Al <sub>2</sub> O <sub>3</sub> by difference | [%]                 | ≥ 99.7              |                 |                 |
| Na <sub>2</sub> O                            | [%]                 | 0.2                 |                 |                 |
| SiO <sub>2</sub>                             | [%]                 | 0.02                |                 |                 |
| Calcination Degree                           |                     | low                 |                 |                 |
| Primary Crystal Size                         | [µm]                | ≤ 0.5               |                 |                 |
| α- Al <sub>2</sub> O <sub>3</sub> Content    | [%]                 | 99.5                |                 |                 |
| Particle Size                                |                     | ULTIMATE P 815      | ULTIMATE P 1500 | ULTIMATE P 2500 |
| ≥ 63 µm / 250 mesh                           | [%]                 | ≤ 0.1               |                 |                 |
| ≥ 45 µm / 325 mesh                           | [%]                 | ≤ 1.0               |                 |                 |
| ≥ 20 µm / 625 mesh                           | [%]                 |                     | ≤ 3.0           | ≤ 0.5           |
| D50 Typical                                  | [µm]                | 9                   | 5               | 2               |
| Physical Properties                          |                     |                     |                 |                 |
| Specific Surface Area                        | [m <sup>2</sup> /g] | 5 - 10              | 4 - 8           | 4 - 7           |
| Loose Bulk Density                           | [g/l]               | 300 - 600           | 450 - 650       |                 |
| Oil Absorption                               | [%]                 | 50 - 63             | 46 - 56         | 60 - 75         |

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APPLICATION: Resin-Polishing



APPLICATION: Metal-Polishing



APPLICATION: Pre-Metal-Polishing

# Calcined Aluminas for Polishing

## Standard Packaging

- 25 kg / 50 lb paper bags
- 900 / 1000 kg / 2500 lb big bag, discharge sleeve and shrink wrapped (depending on bulk density)

Contact for sales, technical information and application assistance

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**SDS 387**