

Polishing Alumina — Technical Data Sheet

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1. PRODUCT DESCRIPTION

AF-P polishing aluminas are calcined alumina powders engineered for precision surface finishing. Each grade is designed for a specific stage of the multi-step polishing process: stock removal (cut) followed by buffing/lapping (polish). During polishing, alumina agglomerates break down into primary crystals that deliver consistent cutting action, then continue as fine smoothing agents. The balance of cut and polish is tuned by controlling calcination degree, primary crystal size, and agglomerate strength. All grades feature well-defined top cut, stable particle size distribution, and contamination-free quality.

2. CHEMICAL COMPOSITION

PARAMETER	AF-P-1	AF-P-2	AF-P-3	AF-P-4
Grade type	Ultra-Finishing	Standard Polishing	Medium Cut	Heavy Cut
Alpha-Al ₂ O ₃	~70%	>97%	>97%	>97%
Na ₂ O	0.35%	0.35%	0.04%	0.25%
SiO ₂	≤ 0.08%	≤ 0.08%	≤ 0.05%	≤ 0.08%
Fe ₂ O ₃	≤ 0.05%	≤ 0.05%	≤ 0.04%	≤ 0.05%
CaO	≤ 0.05%	≤ 0.05%	≤ 0.04%	≤ 0.05%

AF-P-1 is a low-calcined transitional alumina with ~70% alpha content. AF-P-2/3/4 are fully calcined with alpha >97%.

3. PHYSICAL PROPERTIES

PARAMETER	UNIT	AF-P-1	AF-P-2	AF-P-3	AF-P-4
D50	µm	3.5	4	15	65
Top cut	µm	20	32	90	200
BET	m ² /g	12	0.9	1.2	0.4
Primary crystal	µm	<0.4	2.5	1.5	3.2
Oil absorption	ml/100g	38	22	34	50
Bulk density	g/cm ³	0.60	0.75	0.70	0.80

Particle size measured by laser diffraction (Malvern Mastersizer). Top cut represents D97. All values are typical.

4. CUT & POLISH CHARACTERISTICS

Cut is the ability to remove stock from the workpiece. Polish is the ability to produce a smooth, glossy surface finish. These are opposing properties — higher calcination (more alpha) yields larger primary crystals and higher cut, while lower calcination yields finer crystals and higher polish. Values on a relative 1–10 scale.

PROPERTY	AF-P-1	AF-P-2	AF-P-3	AF-P-4
Cut	1	5	3	8.5
Polish	9	4	7	2
Recommended stage	Finishing / mirror	Pre-polish + polish	Polish + finish	Pre-polish / stock removal
Agglomerate type	Soft	Medium hard	Medium hard	Hard

5. MULTI-STAGE POLISHING GUIDE

STAGE	RECOMMENDED GRADE	GOAL
1. Pre-polish (stock removal)	AF-P-4	Remove surface defects, scratches, and oxidation at maximum rate
2. Intermediate polish	AF-P-2 or AF-P-3	Reduce roughness left by pre-polish; prepare for finishing
3. Finishing (high gloss)	AF-P-1	Produce mirror finish; minimal stock removal

6. APPLICATIONS BY MATERIAL

WORKPIECE MATERIAL	RECOMMENDED GRADES
Steel, stainless steel	AF-P-2, AF-P-3, AF-P-4
Chrome, hard chrome	AF-P-2, AF-P-3
Brass, copper, non-ferrous	AF-P-1, AF-P-3
Precious metals, jewellery	AF-P-1
Aluminium	AF-P-1, AF-P-3
Stone, marble, granite	AF-P-1, AF-P-2
Glass, optical glass	AF-P-1
Plastics	AF-P-1
Varnishes, clear coats	AF-P-1

7. FORMULATION FORMATS

AF-P polishing aluminas can be applied in all standard formats:

- **Solid compounds** — buffing bars and wax-based compounds (AF-P-2, AF-P-4: oil absorption tuned for binder compatibility)
- **Liquid compounds** — suspension concentrates for automated polishing lines
- **Dry powder** — direct application for hand-polishing and blasting
- **Suspension / slurry** — water or oil-based slurries for precision lapping (AF-P-1, AF-P-3: excellent dispersion stability)

8. PACKAGING & STORAGE

- 25 kg paper sacks on 1000 kg pallets (standard)
- 500 kg or 1000 kg big bags
- Plastic drums available for fine grades (AF-P-1) on request
- Store in dry conditions at 10–30°C
- Shelf life: indefinite when stored properly in sealed containers

9. SAFETY

Non-hazardous under REACH and OSHA HCS. As with all fine particulates, avoid dust inhalation — use local exhaust ventilation and respiratory protection (NIOSH N95 or equivalent) when handling grades AF-P-1 and AF-P-2. Prolonged inhalation of fine alumina dust may cause mild respiratory irritation. Avoid eye contact; wear safety glasses. Full SDS available on request.

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The information herein is believed to be accurate and is offered in good faith, but without warranty. Buyers should conduct their own tests to determine suitability for their application. Cut and polish values are relative ratings on a 1–10 scale for comparative purposes only.