



Blending PolyAl correctly

How to get consistent, predictable results when you compound PolyAl into your own resin

1 • Dosage windows

- Into PE / HDPE parts: 20-40% PolyAl. Into PP parts: 15-25% PolyAl.
- Start at 15% and step up. Approve each step on impact and tear – not only on modulus.

2 • The compatibiliser (the single biggest lever)

- PE and PP are immiscible: without a compatibiliser, blend interfaces become crack initiators and the part gets MORE brittle.
- Use a maleic-anhydride grafted compatibiliser: PE-g-MA when your matrix is PE, PP-g-MA when it is PP. Dose: 2-4% of the total blend.
- MA-grafted grades also bond chemically to the aluminium fraction (Al-OH + anhydride) – turning the flake from a defect into bonded filler.
- For extra impact: 5% POE elastomer on top.

3 • Moisture

- Pre-dry PolyAl 3 h at 85-95 °C – never above 105 °C (LDPE matrix). Target < 0.15%.
- Symptoms of wet material: foaming, voids, splay. A vented barrel helps but does not replace drying.

4 • Mixing practice

- Make a homogeneous dry blend in a mixer or tumbler BEFORE the hopper – never layer materials in the hopper.
- Gravimetric dosing units work well for continuous production.

5 • Processing window

- Melt temperature 160-190 °C. Above 200 °C: odour and degradation risk.
- Moderate screw speed; purge before and after runs. Measure MELT temperature, not barrel setpoint – the aluminium creates local friction peaks.

6 • Part design rules

- Wall thickness $\geq$ 2-2.5 mm. Generous radii. Avoid long thin flow paths and fine details.
- Keep weld lines away from load points.

7 • QC that predicts reality

- On every new blend measure: MFI, notched Charpy and tear resistance.
- Modulus alone will approve recipes that break in service.

8 • Equipment note

- For intensive use, a nitrided or bimetallic screw is recommended – the aluminium oxide skin is abrasive over time.

9 • What to expect (lab reference, 20% PP into PolyAl)

- Tensile +9% · flexural modulus +20% · notched Charpy +25% vs neat PolyAl. Your figures will vary with resin and equipment.

Prefer to skip all of this? Ask for GP Compound P23 or P20-Flex: the same science, pre-formulated, homogenised in a twin-screw and delivered with a Certificate of Analysis per lot.