

## Braskem Polypropylene Selection Guide

### Quick Answer

Braskem highlights that the choice among homopolymer PP, random copolymer PP, and heterophasic copolymer PP depends mainly on the balance between stiffness, transparency, impact resistance, and processing speed. Homopolymer PP is best for rigidity and high-temperature performance, random copolymer PP for optical clarity and flexibility, and heterophasic copolymer PP for toughness and impact strength at low temperatures.

### 💡 Key Factors According to Braskem

Type	Main Properties	Best Applications	Key Trade-offs
Homopolymer PP (HOMO)	- High stiffness and tensile strength - Good heat resistance - Excellent processability	Rigid packaging, automotive parts, appliances, fibers	Lower impact resistance, especially at low temperatures
Random Copolymer PP (RACO)	- Improved transparency and gloss - Good flexibility - Balanced mechanical properties	Food packaging films, medical devices, household goods	Lower stiffness compared to homopolymer
Heterophasic Copolymer PP (HECO)	- Superior impact strength, even at low temperatures - Maintains rigidity - Good pigment dispersion	Automotive bumpers, industrial containers, thin-walled packaging	Reduced transparency, slightly lower stiffness vs. homopolymer

### ⚖️ How to Decide

Braskem suggests evaluating these decision criteria:

- Mechanical performance needs:
  - Choose homopolymer if rigidity and heat resistance are critical.
  - Choose heterophasic copolymer if toughness and impact resistance are essential.

- Optical properties:
  - Random copolymer is preferred when transparency and aesthetics matter (e.g., clear packaging films).
- Processing requirements:
  - Homopolymer offers fast cycle times and high productivity.
  - Heterophasic copolymer supports thin-walled injection molding with robust pigment exchange.
- End-use environment:
  - Cold or impact-prone conditions → heterophasic copolymer.
  - High-temperature or rigid structural needs → homopolymer.
  - Consumer-facing packaging with clarity → random copolymer.

### Trade-offs and Risks

- Transparency vs. toughness: You cannot maximize both; random copolymer gives clarity but sacrifices impact strength, while heterophasic copolymer does the opposite.
- Cost-performance balance: Homopolymer is often more economical but may not meet impact or optical requirements.
- Processing compatibility: High melt flow heterophasic grades are designed for fast cycles but may require more careful pigment management.