

PROCESSING AND HANDLING

LARGE WINDOW OF PROCESS CONDITIONS

Pebax® has been historically documented as having excellent processability in each of the major thermoplastic processing technologies:

- Injection molding
- Extrusion (cast film, blown film, sheet, tube...)
- Assembly process: overmolding and coextrusion

HANDLING RECOMMENDATIONS

- Ready to use products without re-drying for unopened bags
- Bag storage at $T < 40-50^{\circ}\text{C}$, without high humidity content
- No heated hopper necessary to process Pebax®
- Bring bags into the workshop 24 hours prior to processing (to avoid condensation)
- Do not use granules from bags that have been open for longer than 2 hours
- During trials, manually close the bags after feeding the hopper to avoid water uptake
- After a one-day trial, reseal the bag before re-using it the next day

Shelf life: 2 years from the date of delivery.

DRYING CONDITIONS

Granules exposed to atmospheric conditions for more than 2 hours should be dried before processing (see table below). Place the granules into a clean flat metallic tray for efficient drying. Arkema highly recommends using vacuum drying ovens because the absence of oxygen allows for higher temperatures and time reduction. Desiccant dryers are also efficient with regularly changed filters. Risk of oxidation is increased with forced-air circulation ovens.

GRADES		RDG 277 / RDG 314	7233	7033	6333	5533	4033 MX 1205	3533	2533
Hot air oven or Vacuum oven	Temperatures ($^{\circ}\text{C}$)	70-80	70-80	70-80	65-75	65-75	60-70	55-65	55-65
	Duration (h)	4-6	4-6	4-6	5-7	5-7	6-8	6-8	6-8

INJECTION RECOMMENDATIONS

- Residence time < 10 min
- 25% $<$ injected volume $<$ 80% of total shot capacity
- 2.2 $<$ compression rate $<$ 2.8
- 18 $<$ L/D $<$ 22
- Correct check-valve
- Depending on the Pebax® grade chosen and on the injection conditions, the shrinkage rate of Pebax® typically varies from 0.5 to 1.5%

EASE OF INJECTION MOLDING

The rheological behavior of Pebax® allows for:

- A wide range of processing temperatures compared to other Thermoplastic Elastomers (especially TPU)
- Ability to inject extremely thin parts (down to 0.8 mm)
- Short cycle times
- High recyclability
- Accurate dimension control

INJECTION MOLDING CONDITIONS

• MELT TEMPERATURE (°C)

GRADES	RDG 277 / RDG 314	7233	7033	6333	5533	4033 MX 1205	3533	2533
Minimum	240	230	230	230	200	200	180	180
Recommended	270	260	260	260	240	240	210	210
Maximum	300	290	290	290	270	270	240	240

• MOLD TEMPERATURE (°C)

GRADES	Pebax® filled (RDG 277, RDG 314)	Rigid Pebax® (5533 → 7233)	Soft Pebax® (2533 → 4033)
Recommended	40-60	25-60	10-30

DRY-BLENDING COMPATIBILITY

With its extensive hardness range, Pebax® is suitable for a vast majority of applications. It is possible however, to mix various grades of Pebax® in order to achieve specific properties. Arkema personnel will be pleased to assist you in selecting the Pebax® blend that will meet your specification criteria.

OVERMOLDING

Insert molding offers a countless combination of possibilities with a variety of materials such as glass, metals, polymers, and textiles. The overmolding technique is widely used to manufacture soles of football and athletic footwear. Pebax® possesses a wide plasticizing range, which makes it highly suitable for overmolding. The adhesion of Pebax® onto inserts can be optimized by adjusting the process parameters. From a general stand point:

- Pebax® can overmold: Pebax®, TPU (preferably Ether type), PVC, leather, coated parts...
- Pebax® can be overmolded by: Rilsan® PA 12, Rilsan® PA 11, Rilsan® Clear...

EXTRUSION CONDITIONS OF PEBAX®

Thanks to the rheological properties of Pebax®, many extrusion and coextrusion techniques are available:

- Films down to 10 µm in cast or blown processes
- Sheets
- Tubes

Pebax® can be extruded on conventional equipment. Arkema personnel will be pleased to provide specific processing parameters related to Pebax® in technologies such as tube sizing, blown film drawing, or the cooling conditions for sheet calendering.

Pebax® Grade	Recommended Temperatures
7033	220°C - 250°C
6333	210°C - 240°C
5533	210°C - 230°C
4033	210°C - 230°C
3533	190°C - 220°C
2533	170°C - 210°C

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See MSDS for Health & Safety Considerations

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