DuPure®

Non-Pelletized Polypropylene Resins

Ducor's **Non-Pelletized PP** resins:

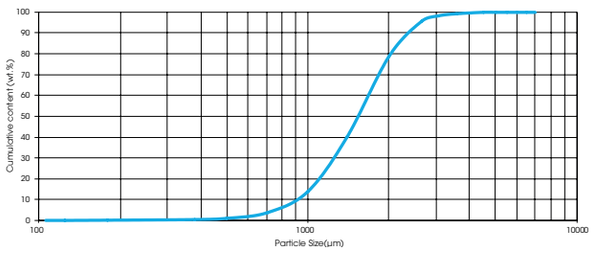
The Ideal Solution for **Masterbatch & Compounding**

Ducor Petrochemicals B.V. is offering a range of Polypropylene Homopolymer & Random Copolymer resins, supplied in the form of free flowing powder. The spherical shape, and narrow particle size distribution with low fines content, of these non-pelletized resins, offers convertors (e.g. compounders, masterbatch producers) significant advantages over conventional polypropylene in pellet/granule form, such as better processability and greater productivity.

Ducor's Non-Pelletized Polypropylene resins, show excellent mixing behavior with additives, liquids, fillers and color pigments, making them very suitable for the production of masterbatches and compounds.

Morphology and Particle Size Distribution

Ducor's non-pelletized resins mainly consist of spherically shaped polypropylene particles, combining a narrow particle size distribution (PSD), with a low fines content. The average particle size is around 1500 microns.



Compared to conventional (i.e. pelletized/granular) polypropylene, Ducor's non-pelletized resins exhibit a less crystalline structure, leading to easier/faster melting of the resin, e.g., resulting in reduced energy consumption during compounding/extrusion.

DuPure® non-pelletized resins in masterbatches

Using DuPure® non-pelletized resins as carrier material in masterbatch production, has a number of advantages over using pellets:

- ✓ Easier premixing with solid (color-)pigments, additives or fillers. Non-pelletized resins show much less segregation of the additives/pigments etc. during premixing, compared to using pellets. Pellets often have to be (cryogenically) grinded for this reason, an extra step which can possibly be avoided by using non-pelletized resins (cost saving).
- ✓ When mixed/blended with liquids, non-pelletized resins often show better "wet out" behavior, which combined with a larger surface/volume ratio (compared to pellets), results in a more homogeneous blend.
- ✓ Easier/faster melting of the non-pelletized resin; higher pigment/filler loading possible.

The resulting masterbatches, based on non-pelletized resins as carrier material, allow for a very uniform dispersion of the incorporated additives/pigments/fillers, into the base polymer. Moreover, using PP random copolymer non-pelletized resins as carrier material, might result in even better dispersion characteristics of the masterbatch, because of its lower melting point.

DuPure® non-pelletized resins in compounds

In compounding, better mixing/dispersion behavior of DuPure® non-pelletized resins with elastomers (e.g. S(E)BS, EPDM) and mineral fillers, is observed, compared to pellets. This is mainly due to the less crystalline morphology of the non-pelletized resins, which leads to easier/faster melting during compounding, resulting in better mechanical properties.

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DUCOR Petrochemicals

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G 01 NP
R 01 NP
T 01 NP
U 01 NP
QR 01 NP
QT 01 NP
QU 01 NP

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Grade Range

Ducor Petrochemicals B.V. currently offers a range of, non-pelletized polypropylene homopolymers (DuPure® "X 01 NP") and random copolymers (DuPure® "QX 01 NP"), as shown in the table below. Non-pelletized PP homopolymers, with MFR's ranging from 3.5 to 50, typically have a high stiffness/modulus, and high melting temperature. The non-pelletized PP random copolymers, with MFR's ranging from 13 to 42, have a lower stiffness and lower melting point.

As Ducor's non-pelletized polypropylene resins do not contain any stabilizing additives, it is recommended, prior to a MFR measurement, to premix the resins with an additive blend as indicated in the table below, to prevent excessive degradation at 230°C when molten in the melt flow indexer.

Properties	Test Method	DuPure® G 01 NP*	DuPure® R 01 NP*	DuPure® T 01 NP*	DuPure® U 01 NP*	DuPure® QR 01 NP*	DuPure® QT 01 NP*	DuPure® QU 01 NP*	Unit
Physical Melt Flow Rate (230 °C / 2.16 kg)	ISO 1133	3.5**	13**	25**	50**	13**	25**	42**	g/10 min
Mechanical Tensile Modulus (1 mm/min)	ISO 527-2	1600	1600	1600	1600	1000	1000	1000	MPa
Thermal Melting Point, DSC	ISO 3146	163	163	163	163	145	145	145	°C
Other Properties Density	ISO 1183	0.91	0.91	0.91	0.91	0.91	0.91	0.91	g/cm³
Co-creation	Additionally, Ducor Petrochemicals B.V. can work closely with its customers to (co-)create different PP Homopolymer & -Random copolymer non-pelletized resins, outside the range shown in the table above, depending on their needs and specifications.								

* Typical values; not to be construed as specifications

** The indicated Melt Flow Rate (MFR) is obtained by premixing the non-pelletized resin with an additive blend, consisting of: 0.25-0.5% Primary (e.g. phenolic) anti-oxidant, 0.25-0.5% Secondary (e.g. phosphite) anti-oxidant, and 0.05 - 0.1% Acid scavenger (e.g. Calcium stearate), prior to the MFR measurement

Storage/Handling/Processing

DuPure® NP resins should be stored in the original packaging, in an indoor area with normal ventilation, under normal/ambient temperature conditions, away from direct sunlight exposure. Under these conditions, DuPure® NP resins can be stored for several months.

Although DuPure® NP resins are non-explosive as received, potential explosion hazards cannot be ruled out, e.g. when fines are accumulating over long periods of time, and are exposed to an ignition source, like e.g. static electricity. Good housekeeping is essential for safe use of DuPure® NP resins. More information is can be found in the Safety Datasheets, available on our website (http://www.ducorchem.com).

Prior to melt-processing, DuPure® NP resins have to be stabilized via addition of (primary & secondary) antioxidants and an acid scavenger (to neutralize acidic catalyst residues), in order to prevent excessive degradation of the polymer. This gives the convertor additional flexibility, to use/incorporate their own additive formulation in the final product.

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