INEOS

Olefins & Polymers Europe

Your partner with

ELTEX® TUB PP

The **efficient** solution
for non pressure drainage
and sewerage pipe systems

ELTEX® TUB PP ICP FOR PIPES

Eltex® TUB PP grades provide the optimal combination of mechanical performance and processability.

Eltex® TUB advanced Impact Copolymer PP grades produced with INEOS Olefins & Polymers proprietary Innovene™ PP process combine an excellent stiffness – impact resistance balance with superior processability.

Eltex® TUB 433-NA00 has an intermediate stiffness and an excellent impact resistance even at low temperatures, fulfilling the additional staircase impact test at -10°C required in some countries by EN 1852-1 and EN 13476-3 (respectively for solid and structured wall gravity pipes) for installation at temperatures below -10°C.

Eltex® TUB 350-HM00 belongs to the latest generation of High Modulus PP impact copolymer (allowing production of SN8/S14 pipes according to EN 1852). It exhibits a very high stiffness (E-Modulus=1900 MPa), a good impact resistance (fulfilling the staircase impact test at -10°C on both solid and structured wall pipes) and enhanced long term thermal stability (OIT) whilst providing excellent processing characteristics.

Both grades readily exceed the pressure resistance requirements of EN standards (at 80 and 95°C).

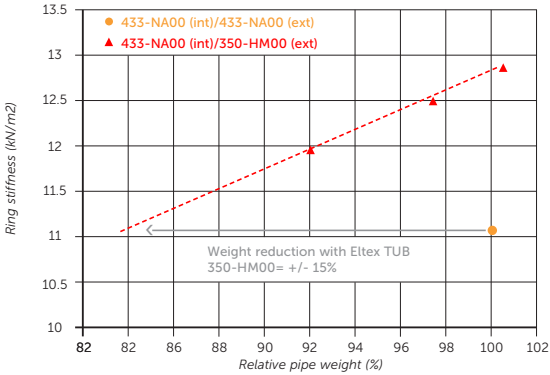
	Test Methods	Eltex® TUB 433-NA00	Eltex® TUB 350-HM00
MFR 230°C/2.16kg (g/10min)	ISO 1133-1	0.3	0.3
Density (kg/m³)	ISO 1183	905	908
Calculated E-modulus ** (MPa)		1500	1900
Notched Charpy impact strength at 0°C * (kJ/m²)	ISO 179/1eA	18	12
Notched Charpy impact strength at -20°C * (kJ/m²)	ISO 179/1eA	7	6
Oxidation Induction Time at 200°C (min)	EN 728	> 30	> 50

* *measured on 4 mm thick injection moulding specimens*
** *calculated from ring stiffness measurements (according to ISO 9969) carried out on 110 mm diameter solid wall pipes*

High Modulus PP – the low weight route

The superior stiffness of Eltex® TUB 350-HM00 allows significant decrease in pipe weight and/or pipe production with enhanced ring stiffness

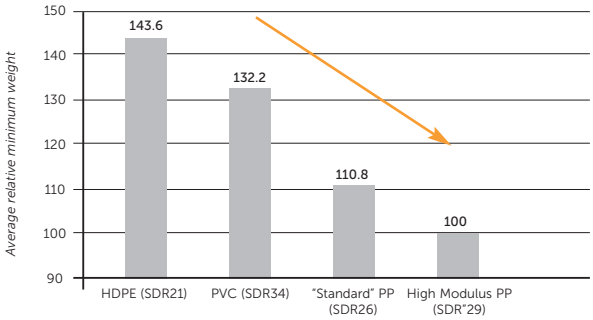
OD 315 mm corrugated pipes



Amongst commercially available High Modulus PP materials, Eltex® TUB 350-HM00 delivers one of the lowest weight pipe that meets the normative requirements of EN1852 and EN13476.

The superior mechanical balance results in the lowest pipe weight or innovation opportunity.

Relative minimum weight of SN8 solid wall pipes



Eltex® TUB PP Homopolymer for pipes

INEOS O&P has complemented its offer of low melt flow rate resins with the development of homopolymer grades for the production of indoor soil and waste discharge systems.

Eltex® TUB 100-NA00 and **101-NA00** have intermediate stiffness and good impact resistance at ambient temperature.

They also have a good long term thermal stability (OIT) and excellent processing characteristics.

Eltex® TUB100-NA00 and 101-NA00 are also suitable for sheet extrusion.

	Test Methods	Eltex® TUB 100-NA00	101-NA00
MFR 230°C/2.16kg (g/10min)	ISO 1133-1	0.3	0.6
Density (kg/m^3)	ISO 1183	909	909
Tensile modulus at 1 mm/min * (MPa)	ISO 527-1,-2	1650	1650
Notched Charpy impact strength at 23°C * (kJ/m^2)	ISO 179/1eA	10	8
Notched Charpy impact strength at 0°C * (kJ/m^2)	ISO 179/1eA	3	2.5
Oxidation Induction Time at 200°C (min)	EN 728	> 20	> 20

** measured on 4 mm thick injection moulding specimens*

Eltex® TUB PP ICP for fittings

Eltex® TUB 400-IM01 has been designed for the injection moulding of fittings and manholes.

It is an impact copolymer grade with excellent processability.

It may also be used for soil & waste pipe production.

It is a nucleated grade which allows faster cooling and therefore reduced moulding cycle times.

It also has excellent dimensional stability.

It offers a superior balance of stiffness and impact strength and has good long term stability.

	Test Methods	Eltex® TUB 400-IM01
MFR 230°C/2.16kg (g/10min)	ISO 1133-1	0.8
Density (kg/m^3)	ISO 1183	905
Flexural modulus * (MPa)	ISO 178	1500
Notched Charpy impact strength at 0°C * (kJ/m^2)	ISO 179/1eA	12
Notched Charpy impact strength at -20°C * (kJ/m^2)	ISO 179/1eA	8
Oxidation Induction Time at 200°C (min)	EN 728	> 20

** measured on 4 mm thick injection moulding specimens*

Enhanced processing behaviour

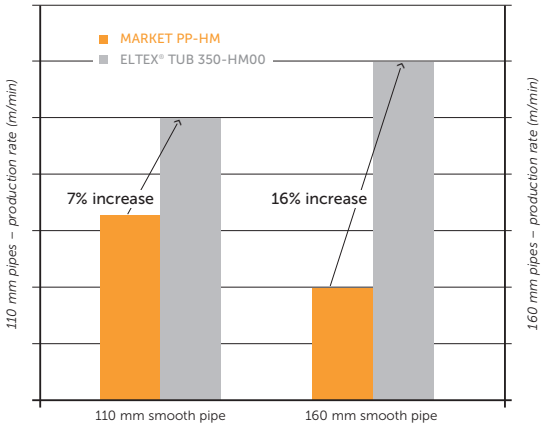
All INEOS O&P PP pipe resins have an excellent reputation with respect to processing in both extrusion and injection moulding processes.

Eltex® TUB433-NA00 and **TUB 350-HM00** are therefore suitable for the production of both solid and structured double wall pipes (internal and external layers).

Compared to High Modulus PP resins currently available, **Eltex® TUB 350-HM00** offers the following advantages:

- **Higher extrusion output** for a given screw speed – higher throughput if extruder is limiting factor; energy savings
- **Lower extrusion temperature** (no overheating linked to PP crystallinity or rheological profile) – higher throughput if cooling is limiting
- Behaving better in corrugating process – no need for blowing pressure and corrugator torque increase
- Suited for in-line integrated socket production

Eltex® TUB PP production rate



Success factors in non pressure drainage and sewerage pipe systems

INEOS O&P gravity pipes manufactured from PP offer many advantages over pipes produced with traditional materials:

- **Light weight** – lower transport and installation costs
- **Easy handling** and **installation**
- **Flexibility** – low failure rate
- **Corrosion free**
- **Excellent abrasion resistance** and **chemical resistance**
- **Smooth & chemically inert internal surface** – no/less deposit and pipe plugging
- **Good impact resistance** at low temperature for ICP
- **Good weldability** for easy installation
- **Long service life** (delivering high durability networks)
- **Polyvalence in use** and suitability for different designs – broad conversion process window

Including material, installation, maintenance & repair costs, PP pipe systems provide a lower "Cost-Over-Lifetime" balance versus traditional materials which benefits the complete value chain.

INEOS is one of the world's largest chemical companies, founded in 1998.

INEOS Olefins & Polymers Europe is a leading producer of olefins and polyolefins.

www.ineos.com

INEOS Olefins & Polymers Europe offers a full range of high value polyolefins solutions for market applications such as food and industrial packaging, pipe and automotive through dedicated sales, and technical service teams.

ECO EXCELLENCE
Our sustainable journey

INEOS is a safe and environmentally responsible company. We are engaged in developing our sustainable agenda to improve our operations and to implement sustainable solutions for our customers. This includes products that offer lightweighting, energy efficiency, durability (extended lifetime) or conservation of resources. We care.

For further information please visit our website at **www.ineos.com** or contact us at **ineospofcsc@ineos.com**