

GreenGran NF30,50,70 (Natural fibre filled PP composite) granules are:

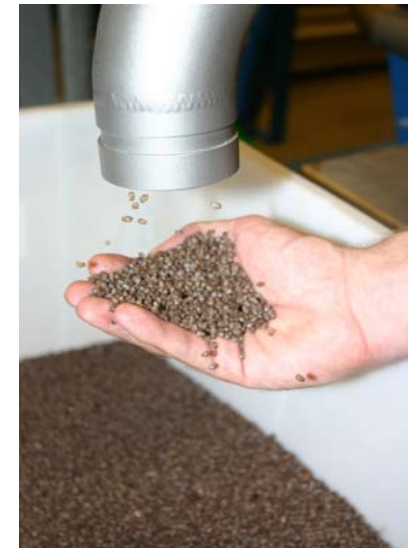
- *cheaper* than PC/ABS, glass fibre filled PC/ABS and glass fibre filled PP granules
- *lighter* than glass fibre filled PC/ABS and glass fibre filled PP granules
- have *strength properties* which are *comparable* with glass fibre filled PC/ABS and glass fibre filled PP granules
- almost *twice as stiff* as glass fibre filled PC/ABS and glass fibre filled PP granules

GreenGran NF30,50,70 granules have additional unique properties:

- it can be injection moulded on existing moulds; *no changes in mould design* are required
- it can be *diluted with PP* granules (MFI 12) by dry-mixing the granules before injection moulding; this is particularly beneficial for applications where lower stiffness properties are sufficient

Due to its high natural fibre content GreenGran NF30,50,70 granules have:

- better Insulating properties (heat, sound)
- better flame retardancy properties (no drops)
- increased heat deflection temperature
- improved dimension stability at higher temperatures
- no sharp edges after car crash (requirement for automotive interior parts)
- CO<sub>2</sub> saving properties, contributing to the Kyoto protocol:
  - sustainable
  - recyclable
  - can be used as fuel at end of life-cycle (with hardly any ash)



Property	Granule type	PC/ABS blend	Glass fibre filled PC/ABS composite	Glass fibre filled PP composite	Natural fibre filled PP composite	Natural fibre filled PP composite	Natural fibre filled PP composite
Brand		PULSE A35-105	PULSE 959	TWINTEX®	GreenGran NF30	GreenGran NF50	GreenGran NF70
Fibre content [wt.%]		0	10	20	30	50	70
Density [kg/m <sup>3</sup> ]		1,120	1,180	1,220	1,000	1,080	1,174
Flexural modulus [MPa]		2,200	3,650	3,420	3,000	4,900	7,000
Flexural strength [MPa]		82	99	109	65	91	97
Tensile modulus [MPa]		2,200	3,800	3,650	3,900	6,900	8,200
Tensile strength [MPa]		52	50	61	41	55	47
Tensile elongation [%]		80	4.0	2.5	5.0	2.9	0.7
Impact strength [kJ/m <sup>2</sup> ], unnotched		NB	9 J/cm <sup>2</sup>	42	22	19	14
HDT at 1.35 MPa [°C]					90	110	139