



# Refill N

Technical datsheet



# CHARACTERISTICS OF THE MATERIAL

## STEREO MICROSCOPIC OBSERVATION

The figure below shows the stereo microscopic observation of the **Refill N** sample.

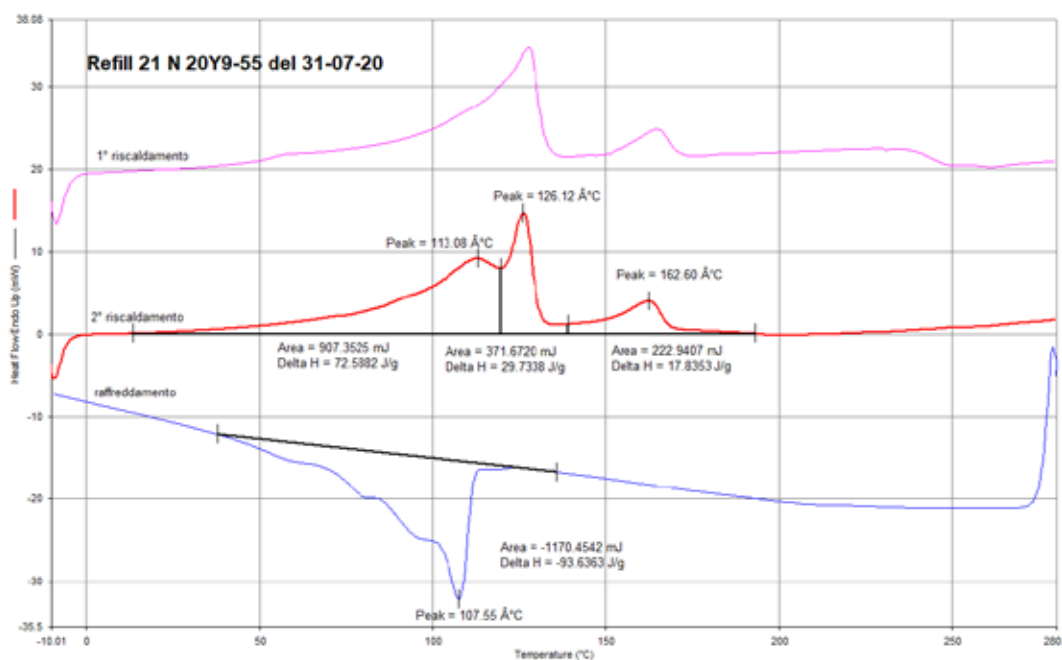


## DSC ANALYSIS

The granules of the **Refill N** sample undergo the DSC analysis with the following thermal program:

- 1° heating from -10°C a 280°C, 20 °C/min in N<sub>2</sub>
- Cooling from 280°C a -10°C, -20 °C/min in N<sub>2</sub>
- 2° heating from -10°C a 280°C, 20 °C/min in N<sub>2</sub>

The figure below shows the DSC thermogram relating to the **Refill N** samples.



DSC Refill N

The DSC analysis shows that the granule consists of three main components such as LDPE, HDPE and PP as evidenced by the three different melting points of the thermogram. The relating percentages reported in Table have been calculated on the basis of the entropy of fusion.

Refill N	
	% in the blend (Average data)
LLDPE/LDPE	60 (±10)
HDPE	30 (±5)
PP	10 (±5)

Thermal data Refill N

## MELT FLOW RATE (MFR)

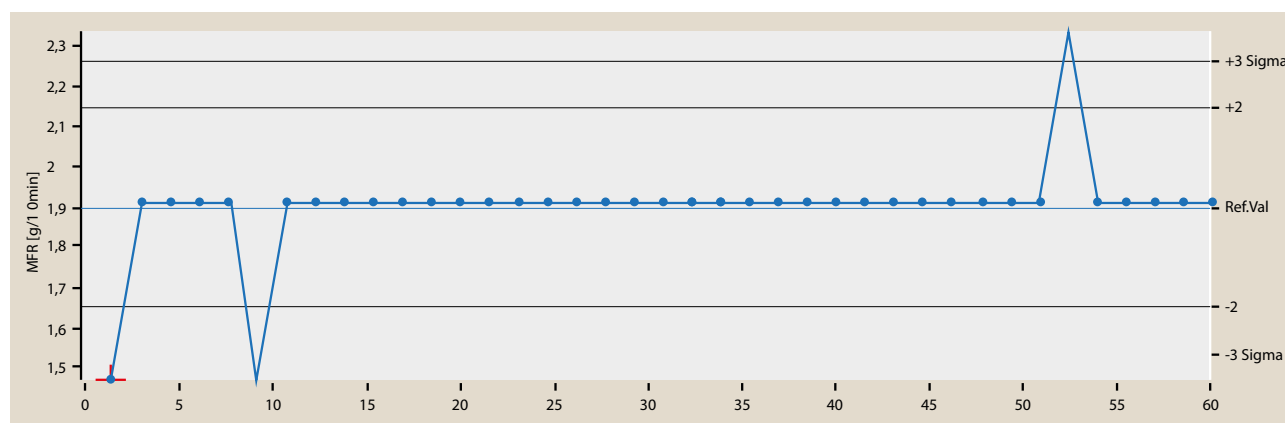
The **Refill N** sample undergoes an MFR analysis according to the ASTM D1238A standard with a weight of 2.16 kg, by setting a temperature of 230°C, preheating the sample for 30 seconds and recovering the material for 60 seconds. The instrument also measures the Melt Volume rate (MVR) during the test.

The average MFR results are shown in the table.

Sample	Average MFR (g/10 min)
Refill N	2,5 (±1)

Results of the MFR tests

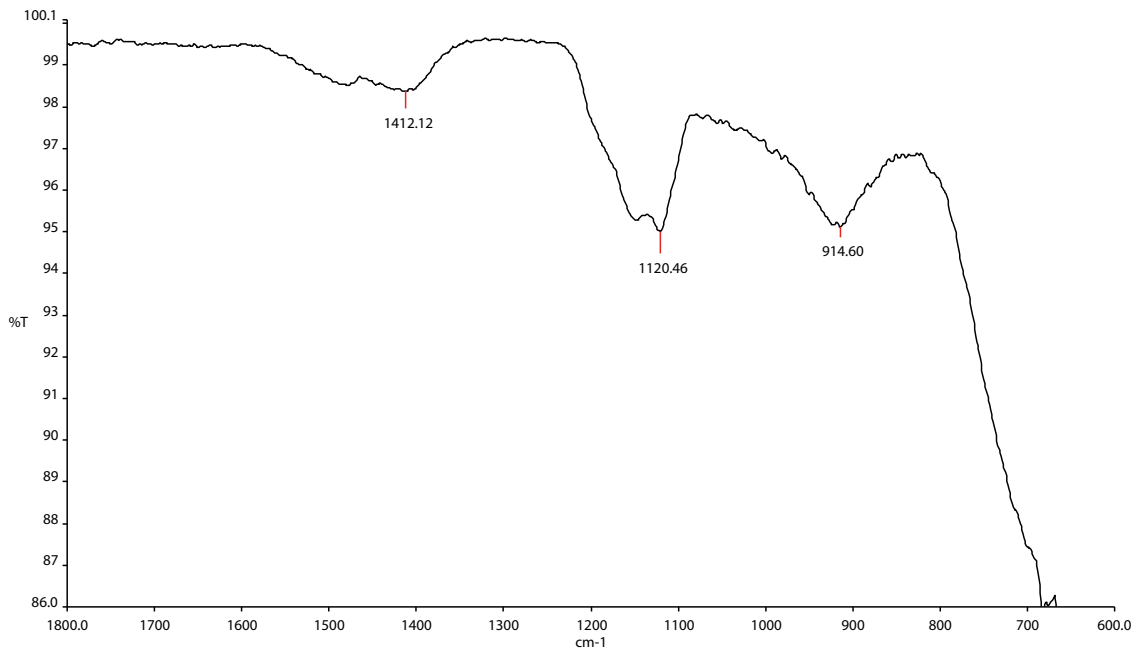
This Figure shows the trend of the MVR as a function of time for the **Refill N** sample.



Trend of the MVR as a function of time for the sample

## ASH ANALYSIS

The ash undergoes a quantitative analysis in accordance with the ISO 3551-1 standard as well as a qualitative one by means of FT-IR spectroscopy. The figure below reports the resulting spectrum:



FT-IR Refill N

The spectrum of the ash thus obtained shows the presence of **calcium carbonate** in major amount. The table shows the results of the quantitative analysis carried out on the **Refill N** sample.

Sample	% ash (Average data)
Refill N	5 ( $\pm 3$ )

Results of the quantitative ash analysis

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## MOISTURE ASSESSMENT

The moisture assessment relies on the gravimetric method described in the UNI 10667-16 standard. A **Refill N** sample with a weight of 100 g is put into an oven at a temperature of 100°C for 2 h. The difference in the sample weight before and after allows for the assessment of the residual moisture. The data obtained are reported in the following table:

Sample	% Moisture (Average data)
Refill N	0,15 ( $\pm 0,05$ )

Moisture test data

## TENSILE STRAIN TESTS

Starting from the **Refill N** granule, the specimens necessary for the performance of the tensile test according to the ISO 527 standard have been injection-moulded.

The table below shows the values obtained.

### Refill N - Polyolefin blend

Property	Test method	Test conditions	Unit of measurement	Typical value
Physical				
Density	ASTM D 792-91	23°C	g/cm <sup>3</sup>	0,96
Melt Flow Index (MFI)	ASTM D 1238A	230/2,16	g/10 min	2,5 (±1)
Ash percentage	UNI 10667-16		%	5 (±3)
Moisture percentage	UNI 10667-16		%	0,15 (±0,05)
Mechanical				
Izod impact strength test	ISO 180A	23°C	KJ/m <sup>2</sup>	50
Izod impact strength test	ISO 180A	-20°C	KJ/m <sup>2</sup>	25
Bending modulus of elasticity	ISO 178		N/mm <sup>2</sup>	500
Tensile strength modulus of elasticity	ISO 527		N/mm <sup>2</sup>	440
Thermal				
HDT Heat Deflection Temperature	ASTM D 648-96		°C	nd
VICAT Heat penetration index	ASTM D 1525-96		°C	nd
Operating temperature	ASTM D 3418-97		°C	165
Moulding conditions				
Barrel temperature			°C	max 250
Mould temperature			°C	60-90
Drying temperature			°C	80
Drying time			h	min4-max24
The product complies with the UNI 10667 standard				
<small>The data shown are the average values of a significant sample of the product and are provided to supply information to the user; they do not constitute any warranty and do not imply in general terms any guarantee or commitment by the Company.</small>				

## COMPLIANCE OF THE MATERIAL WITH THE REACH REGULATION

The table shows the results of the analysis performed on the sample to assess its compliance with the Reach Regulation.

Parameter	Unit of measurement	Method	Result
PCB (polychlorinated biphenyl)	mg/kg	EPA 3541 EPA 3640A EPA8270D	<0,5

CHLOROPARAFFINS		EPA 3541 EPA 3640A EPA8270D	
C10-C13	mg/kg		< 5,0
C14-C17	mg/kg		< 5,0
C18-C20	mg/kg		< 5,0

PHTHALATES		EPA 3541 EPA 3640A EPA8270D	
DIMETHYL PHTALATE	mg/kg		< 1,0
DIETHYL PHTALATE	mg/kg		< 1,0
DI-N-BUTYL PHTHALATE	mg/kg		< 1,0
DIISOBUTYL PHTHALATE	mg/kg		2,0
BENZYL BUTYL PHTHALATE	mg/kg		< 1,0
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg		35,0
OTHER PHTHALATES	mg/kg		< 1,0

POLYCYCLIC AROMATIC HYDROCARBONS (IPA)		EPA 3541 EPA 3640A EPA8270D	
NAPHTALENE	µg/kg		< 5,0
ACENAPHTHYLENE	µg/kg		< 5,0
ACENAPHTHENE	µg/kg		< 5,0
FLUORENE	µg/kg		< 5,0
PHENANTHRENE	µg/kg		< 5,0
ANTHRACENE	µg/kg		< 5,0
FLUORANTHENE	µg/kg		< 5,0
PYRENE	µg/kg		< 5,0
BENZ(a)ANTHRACENE	µg/kg		< 5,0
CHRYSENE	µg/kg		< 5,0
BENZO(b)FLUORANTHENE	µg/kg		< 5,0
BENZO(k)FLUORANTHENE	µg/kg		< 5,0
BENZO(j)FLUORANTHENE	µg/kg		< 5,0
BENZO(e)PYRENE	µg/kg		< 5,0
BENZO(a)PYRENE	µg/kg		< 5,0
PERYLENE	µg/kg		< 5,0
INDENO(1,2,3-cd)PYRENE	µg/kg		< 5,0
DIBENZ(a,h)ANTHRACENE	µg/kg		< 5,0
BENZO(g,h,i)PERYLENE	µg/kg		< 5,0
DIBENZO(a,l)PYRENE	µg/kg		< 5,0
DIBENZO(a,e)PYRENE	µg/kg		< 5,0
DIBENZO(a,i)PYRENE	µg/kg		< 5,0
DIBENZO(a,h)PYRENE	µg/kg		< 5,0

HEXAVALENT CHROMIUM (CR VI)	mg/kg	EPA 3060A EPA 7196A	< 5,0
HEAVY METALS			
ANTIMONY	mg/kg	UNI EN 13657 UNI EN ISO11885	< 5,0
ARSENIC	mg/kg	UNI EN 13657 UNI EN ISO11885	< 5,0
CADMIUM	mg/kg	UNI EN 13657 UNI EN ISO11885	< 5,0
CHROMIUM	mg/kg	UNI EN 13657 UNI EN ISO11885	< 5,0
MERCURY	mg/kg	UNI EN 13657 EPA 6010C	<2,0
NICKEL	mg/kg	UNI EN 13657 UNI EN ISO11885	< 5,0
LEAD	mg/kg	UNI EN 13657 UNI EN ISO11885	< 5,0
COPPER	mg/kg	UNI EN 13657 UNI EN ISO11885	< 5,0
SELENIUM	mg/kg	UNI EN 13657 UNI EN ISO11885	< 5,0
TIN	mg/kg	UNI EN 13657 UNI EN ISO11885	< 5,0
TELLURIUM	mg/kg	UNI EN 13657 UNI EN ISO11885	< 5,0
ZINC	mg/kg	UNI EN 13657 UNI EN ISO11885	< 5,0

## EXAMPLES OF USE





## REJET SPA

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