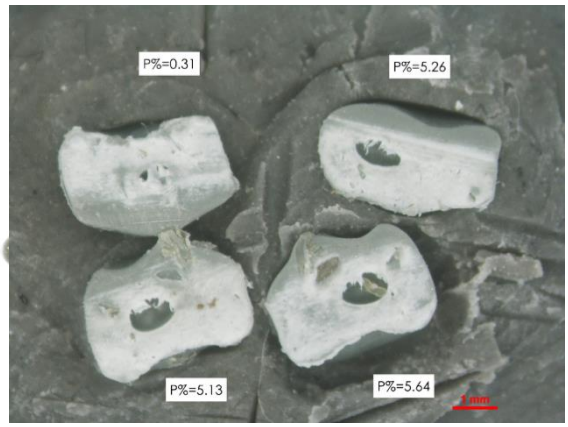
Replay 33

Revet

CHARACTERISTICS OF THE MATERIAL

STEREO MICROSCOPIC OBSERVATION

The figure below shows the product and stereo microscopic observation of the cutting surface of a **Replay 33** sample.

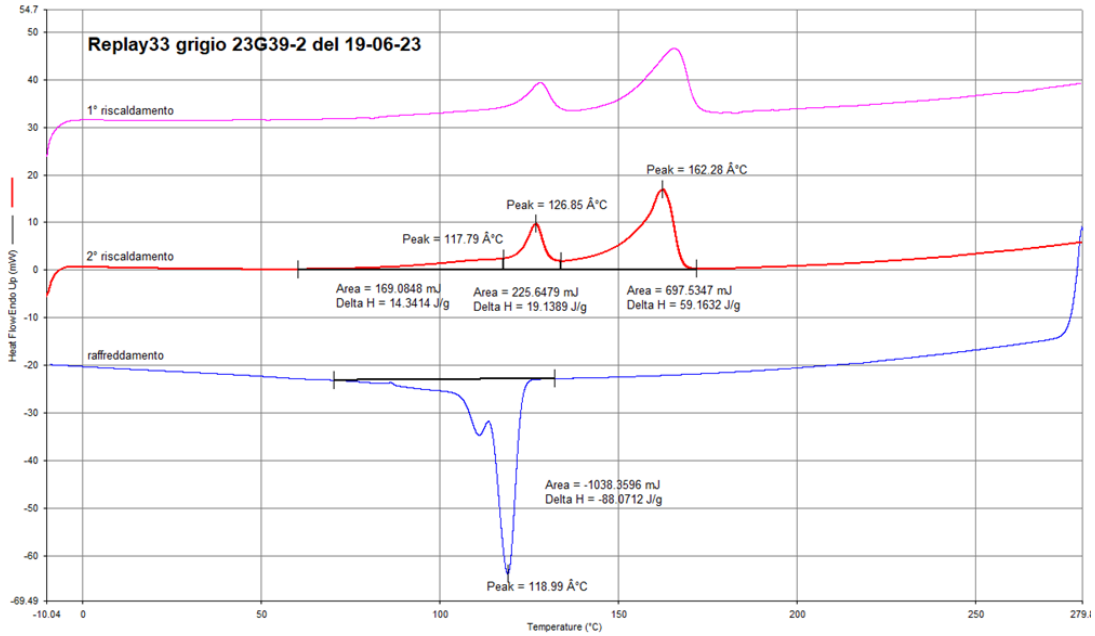


DSC ANALYSIS

The **Replay33** granules were analyzed by DSC with the following thermal program:

- 1° heating from -10°C a 280°C, 20 °C/min in N_2
- Cooling from 280°C a -10°C, -20 °C/min in N_2
- 2° heating from -10°C a 280°C, 20 °C/min in N_2

The figure below shows the DSC thermogram of **Replay 33.**



Replay 33 thermogram

L’analisi DSC mostra che il granulo risulta essere costituito da tre componenti principali quali LDPE, HDPE e PP come si può vedere dai diversi punti di fusione del termogramma.
In tabella sono riportate le percentuali indicative dei componenti principali calcolate sulla base dell’entalpia di fusione.

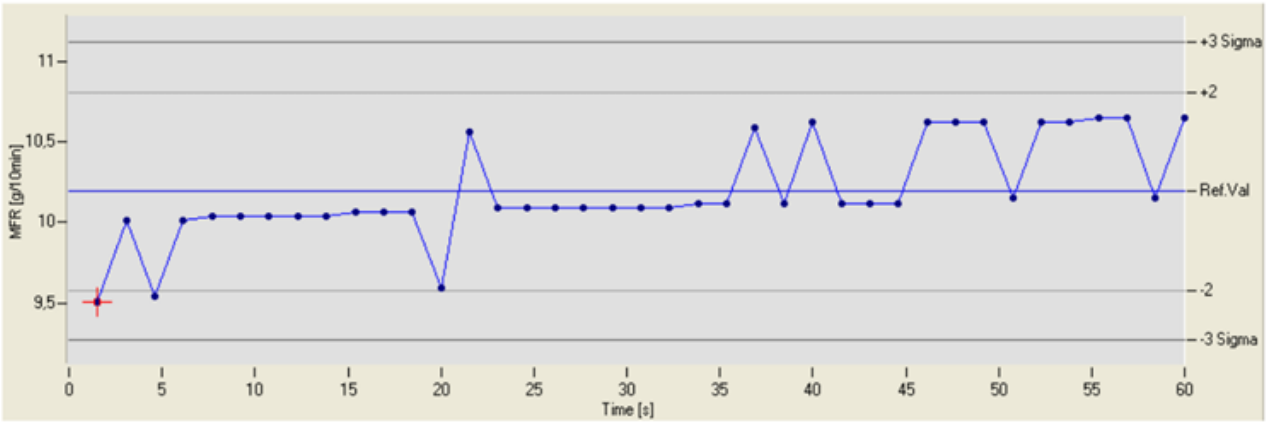
Replay 33	
	% in the blend (*)
LLDPE/LDPE	15
HDPE	25
PP	> 50

Composition of Replay 33 (*) The reported components percentages are indicative

MELT FLOW RATE (MFR)

A MFR analysis was carried out on the **Replay 33** granules according to the ASTM D1238A standard with a weight of 2.16 kg. The analysis was performed at **230 °C**, preheating the sample for 180 seconds and recovering the material for 60 seconds. The instrument also measures the Melt Volume Rate (MVR) during the test.
The average results of MFR and MVR are reported in the table below

Sample	MFR (Average data)	MVR (Average data)
Replay 33	**7,9** g/10 min	10,20 ± 0,30 cm^3/10 min



Trend of the MVR as a function of time for the sample of Replay 33 at 230 °C

ASH ANALYSIS

The ashes were analyzed in accordance with the ISO 3451 standard and they were analyzed also by FT-IR spectroscopy. The analysis shows the presence of **inorganic salts, silicates and calcium oxide**. The table shows the results of the quantitative analysis carried out on the **Replay 33.**

Sample	% Ashes (Average data)
Replay 33	1.9

Average result for ashes determination

MOISTURE ASSESSMENT

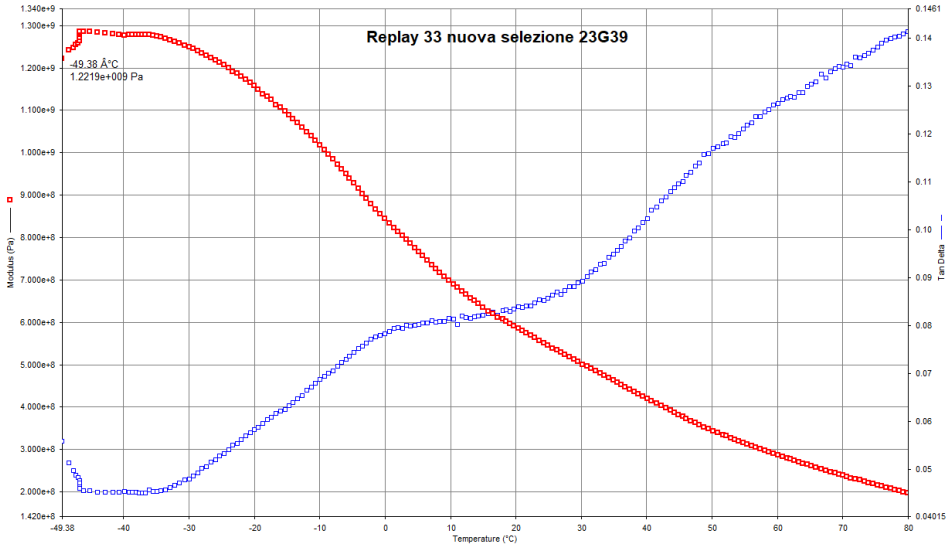
The moisture assessment was performed following the UNI 10667-16 standard. A **Replay 33** sample was dried into an oven at 100°C for 8 h. The residual moisture in the granules was less/equal to 0.2%

Sample	% Moisture (Average data)
Replay 33	≤ 0.2

Average values of moisture in the Replay 33 granules

DMA Analysis

The sample of **Replay 33** was analyzed by DMA in single cantilever mode with an oscillation frequency equal to 1Hz, according in a range of temperature between a thermal program -50 °C to 80 °C at 5 °C/ min.



DMA graph of Replay 33, storage modulus E' in red, TanDelta in blue

The **Replay 33** has an initial storage modulus E' equal to 1,22E+09 Pa. The glass transition temperature is not visible in the analyzed temperature range.

TECHNICAL DATA SHEET

Replay 33- polyolefins blend

Property	Test method	Test conditions	Unit of measurement	Typical value
PHYSICAL				
Density	ASTM D 792-91	23°C	g/cm^3	0,923
Melt Flow Rate (MFR)	ASTM D 1238A	230/2,16	g/10 min	7.9
Ash percentage	ISO 3451		%	1.9
Moisture percentage	UNI 10667-16		%	≤ 0.2
MECHANICAL				
Izod impact strength test	ISO 180A	23°C	KJ/m^2	43 ±6
Izod impact strength test	ISO 180A	-20°C	KJ/m^2	22 ±3
Bending modulus of elasticity	ISO 178		N/mm^2	888
Tensile strength modulus of elasticity	ISO 527		N/mm^2	984
THERMAL				
HDT Heat Deflection Temperature	ASTM D 648-96		°C	nd
VICAT Heat penetration index	ASTM D 1525-96		°C	nd
Melting point (for each mixture peak)	ASTM D 3418-97		°C	118,127,162
MOLDING CONDITIONS				
Barrel temperature			°C	190-220
Mould temperature			°C	30-60
Drying temperature			°C	60-80
Drying time			h	4

The product complies with the UNI 10667 standard.
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. The mean value obtanined in the tensile tests have a confidence interval established at 95% of the mean value.

COMPLIANCE OF THE MATERIAL WITH THE REACH REGULATION

The table shows the results of the analysis performed on the sample to assess **Replay 33** compliance with the Reach Regulation.

Parameter	Unit of measurement	Method	Result
PCB (PCB (polychlorinated biphenyl))	mg/kg	EPA 3550C EPA8270E	< 310

CHLOROPARAFFINS		EPA 3550C EPA8270E	
C10-C13	mg/kg		< 10
C14-C17	mg/kg		< 10
C18-C20	mg/kg		< 10

PHTHALATES		EPA 3550C EPA8270E	
DI-N-BUTYL PHTHALATE (DBP)	mg/kg		<50
DI - ISOBUTYL PHTHALATE (DIBP)	mg/kg		<50
BENZYL BUTYL PHTHALATE (BBP)	mg/kg		<50
BIS(2-ETHYLHEXYL) PHTHALATE (DEHP)	mg/kg		72
DI-ISO NONIL PHTHALATE (DINP)	mg/kg		<50
DI-ISO DECIL PHTHALATE (DINP)	mg/kg		<50
DI-N -OCTIL PHTHALATE (DNOP)	mg/kg		<50

POLYCYCLIC AROMATIC HYDROCARBONS (IPA)		EPA 3550C EPA8270E	
NAPHTALENE	µg/kg		< 100
ACENAPHTHYLENE	µg/kg		< 100
ACENAPHTHENE	µg/kg		< 100
FLUORENE	µg/kg		< 100
PHENANTHRENE	µg/kg		< 100
ANTHRACENE	µg/kg		< 100
FLUORANTHENE	µg/kg		< 100
PYRENE	µg/kg		< 100
BENZ(a)ANTHRACENE	µg/kg		< 100
CHRYSENE	µg/kg		< 100
BENZO(b)FLUORANTHENE	µg/kg		< 100
BENZO(k)FLUORANTHENE	µg/kg		< 100
BENZO(j)FLUORANTHENE	µg/kg		< 100
BENZO(e)PYRENE	µg/kg		< 100
BENZO(a)PYRENE	µg/kg		< 100
PERYLENE	µg/kg		< 100
INDENO(1,2,3-cd)PYRENE	µg/kg		< 100
DIBENZ(a,h)ANTHRACENE	µg/kg		< 100
BENZO(g,h,i)PERYLENE	µg/kg		< 100
DIBENZO(a,l)PYRENE	µg/kg		< 100
DIBENZO(a,e)PYRENE	µg/kg		< 100
DIBENZO(a,i)PYRENE	µg/kg		< 100
DIBENZO(a,h)PYRENE	µg/kg		< 100

HEXAVALENT CHROMIUM (CR VI)	mg/kg	EPA 3060A EPA 7196A	< 1.0

HEAVY METALS			
ANTIMONY	mg/kg	UNI EN 13657 UNI EN ISO11885	<9,1
ARSENIC	mg/kg	UNI EN 13657 UNI EN ISO11885	<21,3
CADMIUM	mg/kg	UNI EN 13657 UNI EN ISO11885	<5,0
CHROMIUM	mg/kg	UNI EN 13657 UNI EN ISO11885	6,3
MERCURY	mg/kg	UNI EN 13657 EPA 6010C	<2,8
NICKEL	mg/kg	UNI EN 13657 UNI EN ISO11885	<7,0
LEAD	mg/kg	UNI EN 13657 UNI EN ISO11885	20,7
COPPER	mg/kg	UNI EN 13657 UNI EN ISO11885	19,9
SELENIUM	mg/kg	UNI EN 13657 UNI EN ISO11885	<62,9
TIN	mg/kg	UNI EN 13657 UNI EN ISO11885	<10,5
TELLURIUM	mg/kg	UNI EN 13657 UNI EN ISO11885	<26,0
ZINC	mg/kg	UNI EN 13657 UNI EN ISO11885	88,8

APPLICATION EXAMPLES AND CURRENT PROJECTS



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