TESTS REPORT

NF EN 14243-2 (February 2019)

Materials obtained from end-of-life tyres – Part 2: Granules and powders – Methods for determining the particle size distribution and impurities including free steel and free textile content

RUBBER GRANULE GM 1.0 – 3.0

RENECAL

LABORATORY TEST REPORT N° R221610.02-A1

LE MANS, 09/01/2023

This report is composed of 3 pages and 2 appendixes.

The results are valid only for the tested samples. Complete results available on request.

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1 ■ CLIENT DETAILS

Company : **RENECAL**
Av. Explosivos, 25
34880 GUARDO (PALENCIA)
SPAIN

Date of order: 25/10/2022

Reception date: 24/11/2022

Sample reference: **033575 – GM 1.0-3.0**

Results apply to samples as received.

2 ■ TESTS PROGRAM

LABOSPORT France has been commissioned by **RENECAL** to carry out the following laboratory tests on rubber granules **GM 1.0 – 3.0** primarily designed for synthetic turf infill:

- Identification with particle size, shape, and bulk density
- Measurement of textile fibre, metal, and other impurities according to:
  - **NF EN 14243-2 (February 2019):** Materials obtained from end-of-life tyres – Part 2: Granules and powders – Methods for determining the particle size distribution and impurities including free steel and free textile content

3 ■ RESULTS

❖ **Identification of the rubber granule**:

Properties	Method	Unit	Results	NF P 90-112* requirements
Particle size	EN 933-1	mm	1.25 – 2.5	d ≥ 0.5 mm D ≤ 3.15 mm
Particle shape	EN 14955	-	Angular – A2	-
Bulk density	EN 1097-3	g/cm^3 ou Mg/m^3	0.43	-
Colour measurement	Internal method	RAL	9 005	-

* The requirement of the NF P 90-112 (2016) standard are given only for information.

➔ Picture and particle size curve of the tested sample are in annex of this report.

❖ **Measurement of fibre rate, metal rate and other impurities in %:**

Element	Method	Units	Results
Fibre rate	NF EN 14243-2 Annex B (1)	(%) (g)	0.00 (1) 0.0
Metal rate	NF EN 14243-2 Annex A (2)	(%) (g)	0.00 (2) 0.0
Impurities rate (glass, sand or non-magnetic metal etc.)	NF EN 14243-2 Annex C (3)	(%) (g)	0.038 (3) 0.0568

(1) The Annex B of the NF EN 14243-2 standard defines that textile fibre integrated inside rubber grains are not considered on the result. Between 150g and 350g of sample mass is necessary to conduct the test.

(2) The Annex A of the NF EN 14243-2 standard defines the test has to be conducted with a sample mass between 150 and 350g.

(3) According to Annex C of the NF EN 14243-2 standard, on the mass used for the determination of the metal and fibre rate (%), a mass as close to 150g is taken to determine the impurities rate.

4 ■ CONCLUSION

The tested sample "Rubber infill **GM 1.0 – 3.0**" do not present fiber rate, and metal rate according to the test method of **NF EN 14243-2** standard: Materials obtained from end-of-life tyres – Part 2: Granules and powders – Methods for determining the particle size distribution and impurities including free steel and free textile content. We can notice 0.038% of impurities rate.

Le Mans, 09/01/2023

APROVAL
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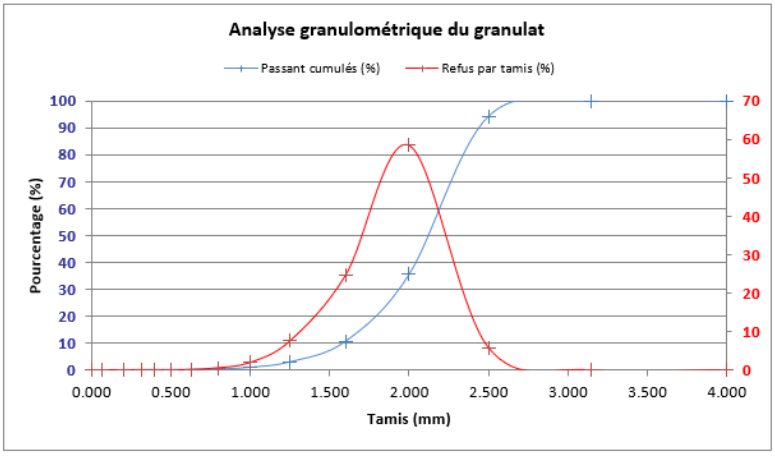
ANNEX 1: RUBBER GRANULE GM 1.0 – 3.0

Picture of rubber granule

Microscope view

Particle Size curve



Ouverture des tamis (mm)	0.000	0.063	0.200	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	2.000	2.500	3.150	4.000
Refus par tamis (%)	0	0	0	0	0	0	0	1	2	8	25	59	6	0	0
Passant cumulés (%)	0	0	0	0	0	0	0	1	1	3	11	36	94	100	100

ANNEX 2: RUBBER GRANULE GM 1.0 – 3.0

Picture of impurities