CENTRUM CERTYFIKACJI JAKOŚCI

CERTIFICATE

No 2020/0001/B/GG

confirming the compliance of the product with the requirements of
Certification Program of Rubber Granulates ed. 01 from 24.08.2020

Name and address of certificate Holder:	**Recykl Organizacja Odzysku S.A.** **ul. Letnia 3, 63-100 Śrem**
Name and address of Manufacturer:	**Recykl Organizacja Odzysku S.A.** **ul. Letnia 3, 63-100 Śrem**
Product name:	**Rubber granulate Green Gran**
Type:	SBR Rubber granulate
Product meets requirements of:	Certification Program of Rubber Granulates ed. 01 from 24.08.2020
Tests were performed by the Laboratory:	Department of Radiometry and Contamination Monitoring, Faculty of New Technologies and Chemistry, Military Univesity of Technology
Number and date of report:	Report of rubber granulate samples analysis from 01.12.2020, Report of rubber granulate samples analysis from 12.01.2021.
Date of issue:	25.01.2021
Certificate expiration date:	2 years if the technical specification of the product has not been changed

The right to use certificate applies only to products having identical properties (parameters) as the product presented for testing and meeting the requirements specified in the application no. 2020/002.

The certificate may be published only by the Certificate Holder without any comments, abbreviations or changes.
Annex No. 1 is an integral part of this certificate.

Notes: -

MILITARY UNIVESITY OF TECHNOLOGY
QUALITY CERTIFICATION CENTER
gen. Sylwestra Kaliskiego 2, 00-908 Warsaw

WOJSKOWA AKADEMIA TECHNICZNA

WAT

CENTRUM CERTYFIKACJI JAKOŚCI CCJ

Joanna Jasińska Ph. D. Eng,
Director of QCC

Annex no 1 to CERTIFICATE No 2020/0001/B/GG

Name and address of certificate holder:	**Recykl Organizacja Odzysku S.A. ul. Letnia 3, 63-100 Śrem**
Name and address of Manufacturer:	**Recykl Organizacja Odzysku S.A. ul. Letnia 3, 63-100 Śrem**
Product name:	**Rubber granulate Green Gran**
Type:	SBR rubber granulate

Product characteristics:

Green Gran granulate based on a mixture of rubbers from used car tires. It is used for the production of rubber products, rubber mixtures, as a modifier of bituminous mass and for the construction of the surface of sports facilities. The product has a stable composition and is safe during storage and transport. If the storage temperature of the granules is not adjusted, it is only possible to lump the product. Green Gran granulate consists mostly of a vulcanized rubber mixture, which includes, among others natural and synthetic rubber, organic and mineral substances, soot and additives.

Sample no. 10/11/2020/A was tested by Department of Radiometry and Contamination Monitoring, Faculty of New Technologies and Chemistry, Military Univesity of Technology.

Product meets the requirements:

Certification Program of Rubber Granulates ed. 01 from 24.08.2020

Annex no 1 to CERTIFICATE No 2020/0001/B/GG

Testing program

Description	Specification
Leaching of elements: As, Ba, Cd, Cr, Cu, Hg, Pb, Zn, Ni, Sn, Sb, Se	ICP-MS
Leaching of BTEX aromatic hydrocarbons in water: benzene, toluene, ethylbenzene, xylenes	GC
Leaching of ions: F–, Cl–, SO_4^{2-}	LC-MS
Leachability of polycyclic aromatic hydrocarbons: naphthalene, phenanthrene, anthracene, fluorene, chrysene, benzo (a) anthracene, benzo (a) pyrene, benzo (e) pyrene, benzo (b) fluoranthene, benzo (k) fluoranthene, benzo (ghi) perylene, benzo (j) fluoranthene, dibenzo (a, h) anthracene	GC-MS/MS
Determination of polycyclic aromatic hydrocarbons in dry weight of an elastomer	GC-MS/MS

Assessment criteria

Description	Specification
Leaching of elements: As, Ba, Cd, Cr, Cu, Hg, Pb, Zn, Ni, Sn, Sb, Se	Zn <0,5 mg/L; Pb <0,025 mg/L; Cd <0,005 mg/L; Cr <0,050 mg/L; Sn <0,04 mg/L; Hg <0,001 mg/L
Leaching of BTEX aromatic hydrocarbons in water: benzene, toluene, ethylbenzene, xylenes	Value for each <1 mg/kg
Leaching of ions: F–, Cl–, SO_4^{2-}	F– <1,5 mg/L, Cl– <35 mg/L, SO_4^{2-} <250 mg/L
Leachability of polycyclic aromatic hydrocarbons: naphthalene, phenanthrene, anthracene, fluorene, chrysene, benzo (a) anthracene, benzo (a) pyrene, benzo (e) pyrene, benzo (b) fluoranthene, benzo (k) fluoranthene, benzo (ghi) perylene, benzo (j) fluoranthene, dibenzo (a, h) anthracene	Value for each <0,5 mg/kg
Determination of polycyclic aromatic hydrocarbons in dry weight of an elastomer	Value for each <0,5 mg/kg

*DIN 18035–6:2014, appendix A, Dz.U. z 2017, poz. 294, PN-EN 71-3, A3:2018-09

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Test results

Description	Value		
Leaching of elements: As, Ba, Cd, Cr, Cu, Hg, Pb, Zn, Ni, Sn, Sb, Se	Element	Concentration [µg/L]	LOD [ng/L]
	As	0,098	3,5
	Ba	8,595	0,3
	Cd	0,010	0,2
	Cr	0,008	2,5
	Cu	3,980	2,1
	Hg	0,305	4,8
	Pb	<LOD	0,3
	Zn	162,502	7,1
	Ni	0,420	0,3
	Sn	0,152	12
	Sb	0,258	2,1
	Se	<LOD	51
Leaching of BTEX aromatic hydrocarbons in water: benzene, toluene, ethylbenzene, xylenes	Compound	Concentration [µg/kg]	LOD [µg/kg]
	Benzen	<LOD	40
	Toluen	<LOD	36
	Etylobenzen	<LOD	27
	m-Ksylen+p-ksylen	<LOD	73
	o-Ksylen	<LOD	148
Leaching of ions: F^-, Cl^-, SO_4^{2-}	Ion	Concentration [µg/L]	LOD [µg/L]
	F–	<LOD	218,3
	Cl–	<LOD	198,7
	SO42–	<LOD	202,3
Leachability of polycyclic aromatic hydrocarbons: naphthalene, phenanthrene, anthracene, fluorene, chrysene, benzo (a) anthracene, benzo (a) pyrene, benzo (e) pyrene, benzo (b) fluoranthene, benzo (k) fluoranthene, benzo (ghi) perylene, benzo (j) fluoranthene, dibenzo (a, h) anthracene	Element	Concentration [µg/kg]	LOD [µg/kg]
	Naphtalene	<LOD	26,7
	Acenaphtene	<LOD	6,7
	Acenaphtylene	<LOD	3,3
	Fluorene	<LOD	6,7
	Fenanthrene	<LOD	13,3
	Anthracene	<LOD	26,7
	Fluoranthene	<LOD	3,3
	Pyrene	<LOD	3,3
	Benzo[a]anthracene	<LOD	13,3
	Chrysene	<LOD	26,7
	Benzo[b]fluoranthene	<LOD	26,7
	Benzo[k]fluoranthene	<LOD	26,7
	Benzo[a]pyrene	<LOD	6,7
	Indeno[1,2,3-cd] pyrene	<LOD	6,7
	Dibenzo[a,h]anthracene	<LOD	13,3
	Benzo[ghi]perylene	<LOD	6,7
Determination of polycyclic aromatic hydrocarbons in dry weight of an elastomer	Element	Concentration [µg/kg]	LOD [µg/kg]
	Naphtalene	<LOD	2,0
	Acenaphtene	<LOD	0,5
	Acenaphtylene	<LOD	0,2
	Fluorene	<LOD	0,5
	Fenanthrene	<LOD	1,0
	Anthracene	<LOD	2,0
	Fluoranthene	<LOD	0,2
	Pyrene	<LOD	0,2
	Benzo[a]anthracene	<LOD	1,0
	Chrysene	<LOD	2,0
	Benzo[b]fluoranthene	<LOD	2,0
	Benzo[k]fluoranthene	<LOD	2,0
	Benzo[a]pyrene	<LOD	0,5
	Indeno[1,2,3-cd] pyrene	<LOD	0,5
	Dibenzo[a,h]anthracene	<LOD	1,0
	Benzo[ghi]perylene	<LOD	0,5

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Tests were performed by the Laboratory:	Department of Radiometry and Contamination Monitoring, Faculty of New Technologies and Chemistry, Military Univesity of Technology
Number and date of report	Report of rubber granulate samples analysis from 01.12.2020, Report of rubber granulate samples analysis from 12.01.2021.

Assessment conclusions:

Based on the *Report of rubber granulate samples analysis from 01.12.2020, Report of rubber granulate samples analysis from 12.01.2021*, provided by the Laboratories of Department of Radiometry and Contamination Monitoring, Faculty of New Technologies and Chemistry, Military Univesity of Technology, states that **Rubber granulate Green Gran** (recycled) meet the requirements of the Certification Program of Rubber Granulates ed. 01 from 24.08.2020