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TEST REPORT

Laboratory tests on an infill material for artificial turf system

Tests performed according to the standards listed in the quote Q23414CAN

Report Number **R23414CAN-D1-Full toxicology**

Product **TTII NATURE'S INFILL 10-20**
Target Technologies International Inc.

Client **John B. Giraud,**
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INFORMATION

Product description	Performance infill for synthetic turf system			
Product name	TTII NATURE'S INFILL 10-20			
Product type	Vegetal / plant based infill			
Sample Number	CAN004850			
Bulk density	0.57 g/cm ³ (35.57 lb/ft ³)	Shape	B2 – Sub round to Rounded	
Date of reception	May 2023			
Date of tests	May 2023			
Temperature	MIN	22°C	MAX	24°C
Humidity	MIN	49 %	MAX	51 %



TTII NATURES IINFILL- CAN004850 –Overview (top) and close-up (bottom)



RESULTS - Toxicological analysis of heavy metals – CAM 17:

Parameter	Units	Test method	Results	Requirements	Pass/Fail
Antimony	mg/kg	EPA 6020B	< 0.250	< 500	Pass
Arsenic	mg/kg	EPA 6020B	< 0.250	< 500	Pass
Barium	mg/kg	EPA 6020B	0.7	< 10 000	Pass
Cadmium	mg/kg	EPA 6020B	< 0.250	< 100	Pass
Chromium	mg/kg	EPA 6020B	< 0.250	< 500	Pass
Lead	mg/kg	EPA 6020B	< 0.250	< 1 000	Pass
Selenium	mg/kg	EPA 6020B	< 0.250	< 100	Pass
Silver	mg/kg	EPA 6020B	< 0.250	< 500	Pass
Mercury	mg/kg	EPA 7471B	< 0.250	< 20	Pass
Beryllium	mg/kg	EPA 6020B	< 0.250	< 75	Pass
Cobalt	mg/kg	EPA 6020B	< 0.250	< 8 000	Pass
Copper	mg/kg	EPA 6020B	0.907	< 2 500	Pass
Zinc	mg/kg	EPA 6020B	5.63	< 5 000	Pass
Molybdenum	mg/kg	EPA 6020B	< 0.250	< 3 500	Pass
Nickel	mg/kg	EPA 6020B	< 0.250	< 2 000	Pass
Thallium	mg/kg	EPA 6020B	< 0.250	< 700	Pass
Vanadium	mg/kg	EPA 6020B	< 1250	< 2 400	Pass

*limits taken from the California Code Of Regulations - §66261.24

Toxicological analysis of phtalates:

Element	Units	Test method	Results	REACH Annex XVII entry 51	Pass/Fail
Dimethylphtalate	mg/Kg	DIN 18035-7	< 0.01	-	-
Diethylphtalate	mg/Kg	DIN 18035-7	< 0.01	-	-
Di-iso-butylphtalate	mg/Kg	DIN 18035-7	< 0.01	< 1000	Pass
Di-n-butylphtalate	mg/Kg	DIN 18035-7	< 0.01	< 1000	Pass
Bis-(2-methoxyethyl)phtalate	mg/Kg	DIN 18035-7	< 0.01	-	-
Benzyl-butylphtalate	mg/Kg	DIN 18035-7	< 0.01	< 1000	Pass
Bis-(2-ethylhexyl)phthalate	mg/Kg	DIN 18035-7	< 0.04	< 1000	Pass
Di-n-octylphtalate	mg/Kg	DIN 18035-7	< 0.02	-	-
Di-iso-nonylphtalate	mg/Kg	DIN 18035-7	< 0.05	-	-
Di-iso-decylphtalate	mg/Kg	DIN 18035-7	< 0.01	-	-
Phtalates – Total sample	mg/Kg	DIN 18035-7	< 0.18	-	-

NOTE: Individual results should be compared to project requirements or local regulations.

For the phtalates for which REACH Annex XV entry 51 had requirements, individual results were analyzed and compared with the limits. Therefore, TTII NATURE'S INFILL 10-20 is **compliant** with REACH Annex XV entry 51 standards.

Toxicological analysis of polycyclic aromatic hydrocarbons (PAHs) – ASTM F3496:

Parameter	Units	Method	Results	Requirements	Pass/Fail
Benzo (a) pyrene	mg/Kg	ASTM F3496	< 0.2	-	-
Benzo (e) pyrene	mg/Kg	ASTM F3496	< 0.2	-	-
Benzo (a) anthracene	mg/Kg	ASTM F3496	< 0.2	-	-
Chrysene	mg/Kg	ASTM F3496	< 0.2	-	-
Benzo (j+b) fluoranthene	mg/Kg	ASTM F3496	< 0.2	-	-
Benzo (k) fluoranthene	mg/Kg	ASTM F3496	< 0.2	-	-
Dibenzo (a,h) anthracene	mg/Kg	ASTM F3496	< 0.2	-	-
Indeno (1,2,3-cd) pyrene	mg/Kg	ASTM F3496	< 0.2	-	-
Benzo (ghi) perylene	mg/Kg	ASTM F3496	< 0.2	-	-
Naphtalene	mg/Kg	ASTM F3496	< 0.2	-	-
Acenaphtene	mg/Kg	ASTM F3496	< 0.2	-	-
Acenaphtylene	mg/Kg	ASTM F3496	< 0.2	-	-
Anthracene	mg/Kg	ASTM F3496	< 0.2	-	-
Fluoranthene	mg/Kg	ASTM F3496	< 0.2	-	-
Fluorene	mg/Kg	ASTM F3496	< 0.2	-	-
Phenanthrene	mg/Kg	ASTM F3496	< 0.2	-	-
Pyrene	mg/Kg	ASTM F3496	0.22	-	-
TOTAL HAP (sum)	mg/Kg	ASTM F3496	< 3.42	< 20	Pass

NOTE: To comply with ASTM F3496 standards, the sum of the 7 PAHs above needs to be below 20 mg/kg. Therefore, TTII NATURE'S INFILL 10-20 is **compliant** with the ASTM F3496 standards.

Parameter	Units	Test method	Results	DIN 18035-7 Requirements	Pass/Fail
Lead (Pb)	mg/L	DIN 18035-7	< 0.001	≤ 0.040	Pass
Cadmium (Cd)	mg/L	DIN 18035-7	< 0.001	≤ 0.005	Pass
Total Chromium (Cr)	mg/L	DIN 18035-7	< 0.01	≤ 0.050	Pass
Tin (Sn)	mg/L	DIN 18035-7	< 0.002	≤ 0.050	Pass
Chromium (Cr VI)	mg/L	DIN 18035-7	< 0.008	≤ 0.008	Pass
Mercury (Hg)	µg/L	DIN 18035-7	0.18	< 1	Pass
Zinc (Zn ²)	mg/L	DIN 18035-7	0.47	≤ 0.50	Pass
EOX	mg/kg MS	DIN 18035-7	24	≤ 100	Pass

Toxicological analysis of phtalates:

Element	Units	Test method	Results	REACH Annex XVII entry 51	Pass/Fail
Dimethylphtalate	mg/Kg	DIN 18035-7	< 0.01	-	-
Diethylphtalate	mg/Kg	DIN 18035-7	< 0.01	-	-
Di-iso-butylphtalate	mg/Kg	DIN 18035-7	< 0.01	< 1000	Pass
Di-n-butylphtalate	mg/Kg	DIN 18035-7	< 0.01	< 1000	Pass
Bis-(2-methoxyethyl)phtalate	mg/Kg	DIN 18035-7	< 0.01	-	-
Benzyl-butylphtalate	mg/Kg	DIN 18035-7	< 0.01	< 1000	Pass
Bis-(2-ethylhexyl)phtalate	mg/Kg	DIN 18035-7	< 0.04	< 1000	Pass
Di-n-octylphtalate	mg/Kg	DIN 18035-7	< 0.02	-	-
Di-iso-nonylphtalate	mg/Kg	DIN 18035-7	< 0.05	-	-
Di-iso-decylphtalate	mg/Kg	DIN 18035-7	< 0.01	-	-
Phtalates – Total sample	mg/Kg	DIN 18035-7	< 0.18	-	-

NOTE: Individual results should be compared to project requirements or local regulations.

For the phtalates for which REACH Annex XV entry 51 had requirements, individual results were analyzed and compared with the limits. Therefore, TTII NATURE'S INFILL 10-20 is **compliant** with REACH Annex XV entry 51 standards.

REPORTED BY



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