

INDEX



Name of infill	Type of testing	Samples received in	Report issued in	Report number
TTII SAFEGUARD COLOR COATED TUMBLED GLASS	UVA - results coming soon			
	Toxicology	2022	2023	22637CAN-E1
	Heat Test	2022	2022	22637CAN-A1
	Sport Performances	2022	2022	22647CAN-B1
	Color change in acid	2022	2022	22637CAN-A1
	Permanent Agglomeration Temperature (PAT)	2022	2022	22637CAN-B1
TTII PLAY IT COOL ARAGONITE	Toxicology	2022	2022	22528CAN-A1
	Heat Test	2022	2022	22026CAN-A1
	Sport Performances	2022	2022	22647CAN-C1
TTII CRYSTAL BRIGHT COLOR COATED SAND	UVA	2022	2022	22411CAN-D1
	Toxicology	2022	2022	22411CAN-B1
	Sport Performances	2022	2022	22647CAN-A1
	Color change in acid	2022	2022	22497CAN-A1
	Permanent Agglomeration Temperature (PAT)	2022	2022	22411CAN-C1

UVA TESTING



Results summary table

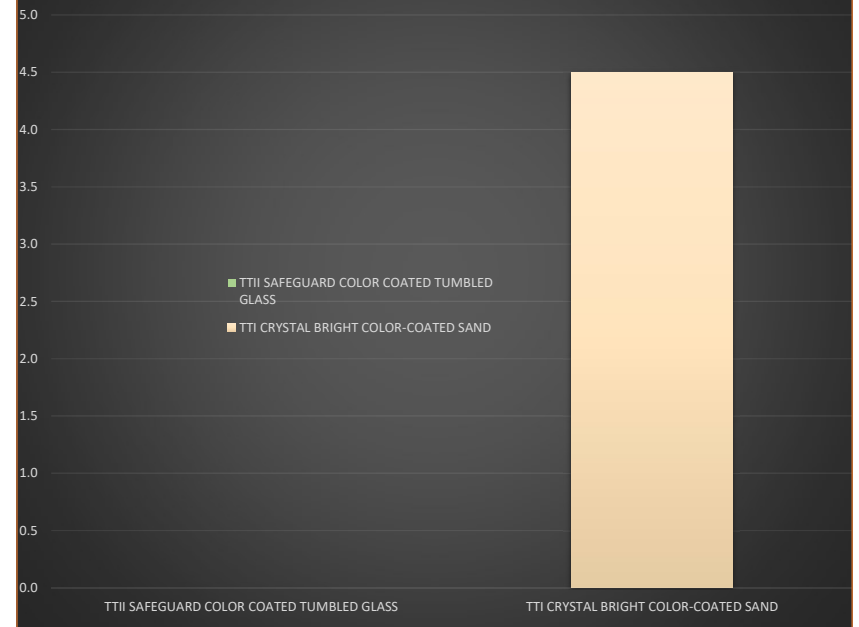
System tested	Color change (Greyscale Index)	Color change FIFA / World Rugby requirements
TTII SAFEGUARD COLOR COATED TUMBLED GLASS	TO BE ADVISED	0
TTI CRYSTAL BRIGHT COLOR-COATED SAND	4.5	3

Note: The higher the color change score, the better

The Grey Scale: 1 – 1/2 – 2 – 2/3 – 3 – 3/4 – 4 – 4/5 – 5 (=No change) indicates the severity of the change of color

FIFA and World Rugby require performance infills to score a 3 or higher

Color change after 5000h UVa - EN 14836



Name of infill	Type of Testing	Test Method	Parameter	Units	Results	Requirements	Pass/Fail
TTII SAFEGUARD COLOR COATED TUMBLED GLASS CAM 17	CAM 17	EPA 6020ICP/MS	Antimony	mg/kg	< 0.250	< 500	Pass
	CAM 17	EPA 6020ICP/MS	Arsenic	mg/kg	< 0.250	< 500	Pass
	CAM 17	EPA 6020ICP/MS	Barium	mg/kg	7.820	< 10000	Pass
	CAM 17	EPA 6020ICP/MS	Beryllium	mg/kg	< 0.250	< 75	Pass
	CAM 17	EPA 6020ICP/MS	Cadmium	mg/kg	< 0.250	< 100	Pass
	CAM 17	EPA 6020ICP/MS	Chromium	mg/kg	0.736	< 500	Pass
	CAM 17	EPA 6020ICP/MS	Cobalt	mg/kg	< 0.250	< 8000	Pass
	CAM 17	EPA 6020ICP/MS	Copper	mg/kg	25.500	< 2500	Pass
	CAM 17	EPA 6020ICP/MS	Lead	mg/kg	2.74	< 1000	Pass
	CAM 17	EPA 6020ICP/MS	Mercury	mg/kg	< 0.250	< 20	Pass
	CAM 17	EPA 6020ICP/MS	Molybdenum	mg/kg	< 0.250	< 3500	Pass
	CAM 17	EPA 6020ICP/MS	Nickel	mg/kg	0.363	< 2000	Pass
	CAM 17	EPA 6020ICP/MS	Selenium	mg/kg	< 0.250	< 100	Pass
	CAM 17	EPA 6020ICP/MS	Silver	mg/kg	< 0.250	< 500	Pass
	CAM 17	EPA 6020ICP/MS	Thallium	mg/kg	< 0.250	< 700	Pass
	CAM 17	EPA 6020ICP/MS	Vanadium	mg/kg	< 1.250	< 2400	Pass
	CAM 17	EPA 6020ICP/MS	Zinc	mg/kg	21.000	< 5000	Pass
TTII SAFEGUARD COLOR COATED TUMBLED GLASS LEACHATES DIN 18035-7	Heavy Metals by leachate	DIN 18035-7	Cadmium	mg/L	< 0.001	≤ 0.005	Pass
	Heavy Metals by leachate	DIN 18035-7	Chromium (Total)	mg/L	< 0.01	≤ 0.050	Pass
	Heavy Metals by leachate	DIN 18035-7	Chromium VI	mg/L	< 0.008	≤ 0.008	Pass
	Heavy Metals by leachate	DIN 18035-7	COD	mg/L	20	≤ 40	Pass
	Heavy Metals by leachate	DIN 18035-7	EOX	mg/L	36	≤ 100	Pass
	Heavy Metals by leachate	DIN 18035-7	Lead	mg/L	0.02	≤ 0.005	Pass
	Heavy Metals by leachate	DIN 18035-7	Mercury	mg/L	< 0.015	≤ 1	Pass
	Heavy Metals by leachate	DIN 18035-7	Tin	mg/L	< 0.005	≤ 0.005	Pass
	Heavy Metals by leachate	DIN 18035-7	Zinc	mg/L	0.089	≤ 0.50	Pass
TTII SAFEGUARD COLOR COATED TUMBLED GLASS EN71-3	Heavy Metals by migration	EN 71-3	Aluminium (Al)	mg/kg DW	45	< 70 000	Pass
	Heavy Metals by migration	EN 71-3	Antimony (Sb)	mg/kg DW	< 0.005	< 560	Pass
	Heavy Metals by migration	EN 71-3	Arsenic (As)	mg/kg DW	< 0.05	< 47	Pass
	Heavy Metals by migration	EN 71-3	Barium (Ba)	mg/kg DW	3.4	< 18 750	Pass
	Heavy Metals by migration	EN 71-3	Boron (B)	mg/kg DW	1.95	< 15 000	Pass
	Heavy Metals by migration	EN 71-3	Cadmium (Cd)	mg/kg DW	0.15	< 17	Pass
	Heavy Metals by migration	EN 71-3	Chromium (Cr III)	mg/kg DW	0.5	< 460	Pass
	Heavy Metals by migration	EN 71-3	Chromium (Cr VI)	mg/kg DW	< 0.053	< 0.2	Pass
	Heavy Metals by migration	EN 71-3	Chromium Total	mg/kg DW	0.5	< 37.5	Pass
	Heavy Metals by migration	EN 71-3	Cobalt (Co)	mg/kg DW	0.05	< 130	Pass
	Heavy Metals by migration	EN 71-3	Copper (Cu)	mg/kg DW	1.85	< 7 700	Pass
	Heavy Metals by migration	EN 71-3	Lead (P)	mg/kg DW	3	< 160	Pass
	Heavy Metals by migration	EN 71-3	Manganese (Ma)	mg/kg DW	5	< 15 000	Pass
	Heavy Metals by migration	EN 71-3	Mercury (Hg)	mg/kg DW	< 0.00075	< 94	Pass
	Heavy Metals by migration	EN 71-3	Nickel (Ni)	mg/kg DW	0.25	< 930	Pass
	Heavy Metals by migration	EN 71-3	Selenium (Se)	mg/kg DW	< 0.025	< 460	Pass
	Heavy Metals by migration	EN 71-3	Strontium (Sr)	mg/kg DW	1.45	< 56 000	Pass
	Heavy Metals by migration	EN 71-3	Tin (Sn)	mg/kg DW	< 0.25	< 180 000	Pass
	Heavy Metals by migration	EN 71-3	Zinc (Zn)	mg/kg DW	11.5	< 46 000	Pass

Continued to next page

Name of infill	Type of Testing	Test Method	Parameter	Units	Results	Requirements	Pass/Fail
TTII SAFEGUARD COLOR COATED TUMBLED GLASS ASTM F3496	PAHs	ASTM F3496	Benzo (a) anthracene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	Benzo (a) pyrene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	Benzo (e) pyrene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	Benzo (j+b) fluoranthene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	Benzo (k) fluoranthene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	Chrysene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	Chrysene	mg/Kg	1.2	-	-
	PAHs	ASTM F3496	Dibenzo (a,h) anthracene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	Dibenzo (a,h) anthracene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	HAP (sum)	mg/Kg	≤ 0.14	< 20	Pass
	Phthalates	DIN 18035-7	Benzyl-butylphtalate	mg/Kg	1.3	< 1000	Pass
TTII SAFEGUARD COLOR COATED TUMBLED GLASS PHTALATES DIN 18035-7	Phthalates	DIN 18035-7	Bis-(2-ethylhexyl)phtalate	mg/Kg	< 1	< 1000	Pass
	Phthalates	DIN 18035-7	Bis-(2-methoxyethyl)phtalate	mg/Kg	< 1	-	-
	Phthalates	DIN 18035-7	Diethylphtalate	mg/Kg	< 1	-	-
	Phthalates	DIN 18035-7	Di-iso-butylphtalate	mg/Kg	< 1	< 1000	Pass
	Phthalates	DIN 18035-7	Di-iso-decylphtalate	mg/Kg	< 1	-	-
	Phthalates	DIN 18035-7	DI-iso-nonylphtalate	mg/Kg	< 1	-	-
	Phthalates	DIN 18035-7	Dimethylphtalate	mg/Kg	< 1	-	-
	Phthalates	DIN 18035-7	Di-n-butylphtalate	mg/Kg	< 1	< 1000	Pass
	Phthalates	DIN 18035-7	Di-n-octylphtalate	mg/Kg	< 1	-	-
	Phthalates	DIN 18035-7	Phtalates – Total sample	mg/Kg	< 10.3	-	-

End of SafeGuard Toxicology

Name of infill	Type of Testing	Test Method	Parameter	Units	Results	Requirements	Pass/Fail
TTII PLAY IT COOL ARAGONITE CAM 17	CAM 17	EPA 6020ICP/MS	Antimony	mg/kg	< 1.220	< 500	Pass
	CAM 17	EPA 6020ICP/MS	Arsenic	mg/kg	< 1.220	< 500	Pass
	CAM 17	EPA 6020ICP/MS	Barium	mg/kg	8.31	< 10000	Pass
	CAM 17	EPA 6020ICP/MS	Beryllium	mg/kg	< 1.220	< 75	Pass
	CAM 17	EPA 6020ICP/MS	Cadmium	mg/kg	< 1.220	< 100	Pass
	CAM 17	EPA 6020ICP/MS	Chromium	mg/kg	< 1.220	< 500	Pass
	CAM 17	EPA 6020ICP/MS	Cobalt	mg/kg	< 1.220	< 8000	Pass
	CAM 17	EPA 6020ICP/MS	Copper	mg/kg	< 1.220	< 2500	Pass
	CAM 17	EPA 6020ICP/MS	Lead	mg/kg	< 1.220	< 1000	Pass
	CAM 17	EPA 6020ICP/MS	Mercury	mg/kg	< 1.220	< 20	Pass
	CAM 17	EPA 6020ICP/MS	Molybdenum	mg/kg	< 1.220	< 3500	Pass
	CAM 17	EPA 6020ICP/MS	Nickel	mg/kg	< 1.220	< 2000	Pass
	CAM 17	EPA 6020ICP/MS	Selenium	mg/kg	< 1.220	< 100	Pass
	CAM 17	EPA 6020ICP/MS	Silver	mg/kg	< 1.220	< 500	Pass
	CAM 17	EPA 6020ICP/MS	Thallium	mg/kg	< 1.220	< 700	Pass
	CAM 17	EPA 6020ICP/MS	Vanadium	mg/kg	< 6.100	< 2400	Pass
	CAM 17	EPA 6020ICP/MS	Zinc	mg/kg	< 12.200	< 5000	Pass
TTII PLAY IT COOL ARAGONITE DIN 18035-7	Heavy Metals by leachate	DIN 18035-7	Cadmium	mg/L	< 0.001	≤ 0.005	Pass
	Heavy Metals by leachate	DIN 18035-7	Chromium (Total)	mg/L	< 0.02	≤ 0.050	Pass
	Heavy Metals by leachate	DIN 18035-7	Chromium VI	mg/L	< 0.008	≤ 0.008	Pass
	Heavy Metals by leachate	DIN 18035-7	COD	mg/L	10.8	≤ 40	Pass
	Heavy Metals by leachate	DIN 18035-7	EOX	mg/L	< 20	≤ 100	Pass
	Heavy Metals by leachate	DIN 18035-7	Lead	mg/L	< 0.005	≤ 0.005	Pass
	Heavy Metals by leachate	DIN 18035-7	Mercury	mg/L	< 0.008	≤ 1	Pass
	Heavy Metals by leachate	DIN 18035-7	Tin	mg/L	< 0.005	≤ 0.005	Pass
TTII PLAY IT COOL ARAGONITE EN71-3	Heavy Metals by leachate	DIN 18035-7	Zinc	mg/L	0.015	≤ 0.50	Pass
	Heavy Metals by migration	EN 71-3	Aluminium (Al)	mg/kg DW	3.9	< 70 000	Pass
	Heavy Metals by migration	EN 71-3	Antimony (Sb)	mg/kg DW	< 0.05	< 560	Pass
	Heavy Metals by migration	EN 71-3	Arsenic (As)	mg/kg DW	< 0.05	< 47	Pass
	Heavy Metals by migration	EN 71-3	Barium (Ba)	mg/kg DW	3.05	< 18 750	Pass
	Heavy Metals by migration	EN 71-3	Boron (B)	mg/kg DW	18	< 15 000	Pass
	Heavy Metals by migration	EN 71-3	Cadmium (Cd)	mg/kg DW	< 0.05	< 17	Pass
	Heavy Metals by migration	EN 71-3	Chromium (Cr III)	mg/kg DW	< 0.15	< 460	Pass
	Heavy Metals by migration	EN 71-3	Chromium (Cr VI)	mg/kg DW	< 0.052	< 0.2	Pass
	Heavy Metals by migration	EN 71-3	Chromium Total	mg/kg DW	0.15	< 37.5	Pass
	Heavy Metals by migration	EN 71-3	Cobalt (Co)	mg/kg DW	< 0.05	< 130	Pass
	Heavy Metals by migration	EN 71-3	Copper (Cu)	mg/kg DW	0.45	< 7 700	Pass
	Heavy Metals by migration	EN 71-3	Lead (P)	mg/kg DW	< 0.25	< 160	Pass
	Heavy Metals by migration	EN 71-3	Manganese (Ma)	mg/kg DW	0.5	< 15 000	Pass
	Heavy Metals by migration	EN 71-3	Mercury (Hg)	mg/kg DW	< 0.00075	< 94	Pass
	Heavy Metals by migration	EN 71-3	Nickel (Ni)	mg/kg DW	0.6	< 930	Pass
	Heavy Metals by migration	EN 71-3	Selenium (Se)	mg/kg DW	< 0.25	< 460	Pass
	Heavy Metals by migration	EN 71-3	Strontium (Sr)	mg/kg DW	1650	< 56 000	Pass
	Heavy Metals by migration	EN 71-3	Tin (Sn)	mg/kg DW	< 0.25	< 180 000	Pass
	Heavy Metals by migration	EN 71-3	Zinc (Zn)	mg/kg DW	0.3	< 46 000	Pass

Continued to next page

Name of infill	Type of Testing	Test Method	Parameter	Units	Results	Requirements	Pass/Fail
TTII PLAY IT COOL ARAGONITE ASTM F3496	PAHs	ASTM F3496	Benzo (a) anthracene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	Benzo (a) pyrene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	Benzo (e) pyrene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	Benzo (j+b) fluoranthene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	Benzo (k) fluoranthene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	Chrysene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	Chrysene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	Dibenzo (a,h) anthracene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	Dibenzo (a,h) anthracene	mg/Kg	< 0.02	-	-
	PAHs	ASTM F3496	HAP (sum)	mg/Kg	< 1.4	< 20	Pass
	Phthalates	DIN 18035-7	Benzyl-butylphtalate	mg/Kg	< 1	< 1000	Pass
TTII PLAY IT COOL ARAGONITE PHTHALATES DIN 18035-7	Phthalates	DIN 18035-7	Bis-(2-ethylhexyl)phtalate	mg/Kg	1.2	< 1000	Pass
	Phthalates	DIN 18035-7	Bis-(2-methoxyethyl)phtalate	mg/Kg	< 1	-	-
	Phthalates	DIN 18035-7	Diethylphtalate	mg/Kg	1.4	-	-
	Phthalates	DIN 18035-7	Di-iso-butylphtalate	mg/Kg	< 1	< 1000	Pass
	Phthalates	DIN 18035-7	Di-iso-decylphtalate	mg/Kg	1.3	-	-
	Phthalates	DIN 18035-7	DI-iso-nonylphtalate	mg/Kg	< 1	-	-
	Phthalates	DIN 18035-7	Dimethylphtalate	mg/Kg	< 1	-	-
	Phthalates	DIN 18035-7	Di-n-butylphtalate	mg/Kg	< 1	< 1000	Pass
	Phthalates	DIN 18035-7	Di-n-octylphtalate	mg/Kg	< 1	-	-
	Phthalates	DIN 18035-7	Phtalates – Total sample	mg/Kg	< 10.9	-	-

Name of infill	Type of Testing	Test Method	Parameter	Units	Results	Requirements	Pass/Fail
TTII CRYSTAL BRIGHT COLOR COATED SAND CAM 17	CAM 17	EPA 6020ICP/MS	Antimony	mg/kg	< 0.250	< 500	Pass
	CAM 17	EPA 6020ICP/MS	Arsenic	mg/kg	0.754	< 500	Pass
	CAM 17	EPA 6020ICP/MS	Barium	mg/kg	67.7	< 10 000	Pass
	CAM 17	EPA 6020ICP/MS	Beryllium	mg/kg	< 0.250	< 75	Pass
	CAM 17	EPA 6020ICP/MS	Cadmium	mg/kg	< 0.250	< 100	Pass
	CAM 17	EPA 6020ICP/MS	Chromium	mg/kg	6.92	< 500	Pass
	CAM 17	EPA 6020ICP/MS	Cobalt	mg/kg	11.2	< 8 000	Pass
	CAM 17	EPA 6020ICP/MS	Copper	mg/kg	30.7	< 2 500	Pass
	CAM 17	EPA 6020ICP/MS	Lead	mg/kg	0.726	< 1 000	Pass
	CAM 17	EPA 6020ICP/MS	Mercury	mg/kg	< 0.1	< 20	Pass
	CAM 17	EPA 6020ICP/MS	Molybdenum	mg/kg	< 0.250	< 3 500	Pass
	CAM 17	EPA 6020ICP/MS	Nickel	mg/kg	20.6	< 2 000	Pass
	CAM 17	EPA 6020ICP/MS	Selenium	mg/kg	< 0.250	< 100	Pass
	CAM 17	EPA 6020ICP/MS	Silver	mg/kg	< 0.250	< 500	Pass
	CAM 17	EPA 6020ICP/MS	Thallium	mg/kg	< 0.250	< 700	Pass
	CAM 17	EPA 6020ICP/MS	Vanadium	mg/kg	< 1.250	< 2 400	Pass
	CAM 17	EPA 6020ICP/MS	Zinc	mg/kg	4.8	< 5 000	Pass
TTI CRYSTAL BRIGHT COLOR COATED SAND LEACHATES DIN 18035-7	Heavy Metals by leachate	DIN 18035-7	Cadmium (Cd)	mg/L	< 0.001	≤ 0.005	Pass
	Heavy Metals by leachate	DIN 18035-7	Chromium (Cr VI)	mg/L	< 0.008	≤ 0.008	Pass
	Heavy Metals by leachate	DIN 18035-7	COD	mg/L	6.6	≤ 40	Pass
	Heavy Metals by leachate	DIN 18035-7	EOX	mg/kg MS	< 20	≤ 100	Pass
	Heavy Metals by leachate	DIN 18035-7	Lead (Pb)	mg/L	< 0.005	≤ 0.040	Pass
	Heavy Metals by leachate	DIN 18035-7	Mercury (Hg)	µg/L	0.02	≤ 1	Pass
	Heavy Metals by leachate	DIN 18035-7	Tin (Sn)	mg/L	< 0.005	≤ 0.050	Pass
	Heavy Metals by leachate	DIN 18035-7	Total Chromium (Cr)	mg/L	0.015	≤ 0.050	Pass
	Heavy Metals by leachate	DIN 18035-7	Zinc (Zn2)	mg/L	0.018	≤ 0.50	Pass
TTI CRYSTAL BRIGHT COLOR COATED SAND ASTM F3496	PAHs	ASTM F3496	Benzo (a) pyrene	mg/Kg	< 0.2	-	-
	PAHs	ASTM F3496	Benzo (e) pyrene	mg/Kg	< 0.2	-	-
	PAHs	ASTM F3496	Benzo (a) anthracene	mg/Kg	< 0.2	-	-
	PAHs	ASTM F3496	Chrysene	mg/Kg	< 0.2	-	-
	PAHs	ASTM F3496	Benzo (j+b) fluoranthene	mg/Kg	< 0.2	-	-
	PAHs	ASTM F3496	Benzo (k) fluoranthene	mg/Kg	< 0.2	-	-
	PAHs	ASTM F3496	Dibenzo (a,h) anthracene	mg/Kg	< 0.2	-	-
	PAHs	ASTM F3496	HAP (sum)	mg/Kg	< 1.4	< 20	Pass
TTI CRYSTAL BRIGHT COLOR COATED SAND EN71-3	Heavy Metals by migration	EN 71-3	Aluminium (Al)	mg/kg DW	80	< 70 000	Pass
	Heavy Metals by migration	EN 71-3	Antimony (Sb)	mg/kg DW	< 0.05	< 560	Pass
	Heavy Metals by migration	EN 71-3	Arsenic (As)	mg/kg DW	< 0.05	< 47	Pass
	Heavy Metals by migration	EN 71-3	Barium (Ba)	mg/kg DW	4.2	< 18 750	Pass
	Heavy Metals by migration	EN 71-3	Boron (B)	mg/kg DW	0.75	< 15 000	Pass
	Heavy Metals by migration	EN 71-3	Cadmium (Cd)	mg/kg DW	< 0.05	< 17	Pass
	Heavy Metals by migration	EN 71-3	Chromium (Cr III)	mg/kg DW	≤ 0.4	< 460	Pass
	Heavy Metals by migration	EN 71-3	Chromium (Cr VI)	mg/kg DW	< 0.053	< 0.2	Pass
	Heavy Metals by migration	EN 71-3	Chromium Total	mg/kg DW	0.4	< 37.5	Pass
	Heavy Metals by migration	EN 71-3	Cobalt (Co)	mg/kg DW	0.45	< 130	Pass
	Heavy Metals by migration	EN 71-3	Copper (Cu)	mg/kg DW	0.95	< 7 700	Pass
	Heavy Metals by migration	EN 71-3	Lead (P)	mg/kg DW	< 0.25	< 160	Pass
	Heavy Metals by migration	EN 71-3	Manganese (Ma)	mg/kg DW	7	< 15 000	Pass
	Heavy Metals by migration	EN 71-3	Mercury (Hg)	mg/kg DW	0.001	< 94	Pass
	Heavy Metals by migration	EN 71-3	Nickel (Ni)	mg/kg DW	0.85	< 930	Pass
	Heavy Metals by migration	EN 71-3	Selenium (Se)	mg/kg DW	< 0.25	< 460	Pass

	Heavy Metals by migration	EN 71-3	Strontium (Sr)	mg/kg DW	1	< 56 000	Pass
	Heavy Metals by migration	EN 71-3	Tin (Sn)	mg/kg DW	< 0.25	< 180 000	Pass
	Heavy Metals by migration	EN 71-3	Zinc (Zn)	mg/kg DW	0.9	< 46 000	Pass

Continued to next page

Name of infill	Type of Testing	Test Method	Parameter	Units	Results	Requirements	Pass/Fail
TTII CRYSTAL BRIGHT COLOR COATED SAND PHTHALATES DIN 18035-7	Phthalates	DIN 18035-7	Benzyl-butylphtalate	mg/Kg	< 1	< 1000	Pass
	Phthalates	DIN 18035-7	Bis-(2-ethylhexyl)phtalate	mg/Kg	< 1	< 1000	Pass
	Phthalates	DIN 18035-7	Bis-(2-methoxyethyl)phtalate	mg/Kg	< 1	-	-
	Phthalates	DIN 18035-7	Diethylphtalate	mg/Kg	< 1	-	-
	Phthalates	DIN 18035-7	Di-iso-butylphtalate	mg/Kg	< 1	< 1000	Pass
	Phthalates	DIN 18035-7	Di-iso-decylphtalate	mg/Kg	5.3	-	-
	Phthalates	DIN 18035-7	DI-iso-nonylphtalate	mg/Kg	14	-	-
	Phthalates	DIN 18035-7	Dimethylphtalate	mg/Kg	< 1	-	-
	Phthalates	DIN 18035-7	Di-n-butylphtalate	mg/Kg	< 1	< 1000	Pass
	Phthalates	DIN 18035-7	Di-n-octylphtalate	mg/Kg	< 1	-	-
	Phthalates	DIN 18035-7	Phtalates – Total sample	mg/Kg	< 27.3	-	-

End of Crystal Bright Toxicology

HEAT TEST



Results summary table

System tested	Max Temperature surface (°C)	FIFA Category
SAFEGUARD COLOR-COATED TUMBLED GLASS / Dry	50	1.5
SAFEGUARD COLOR-COATED TUMBLED GLASS / Wet	45	1.0
PLAY-IT-COOL system / Dry	56	2.0
PLAY-IT-COOL system / Wet	42	1.0
Generic 40 mm - SBR system / Dry	60	2.5
Generic 40 mm - SBR system / Wet	51	1.5

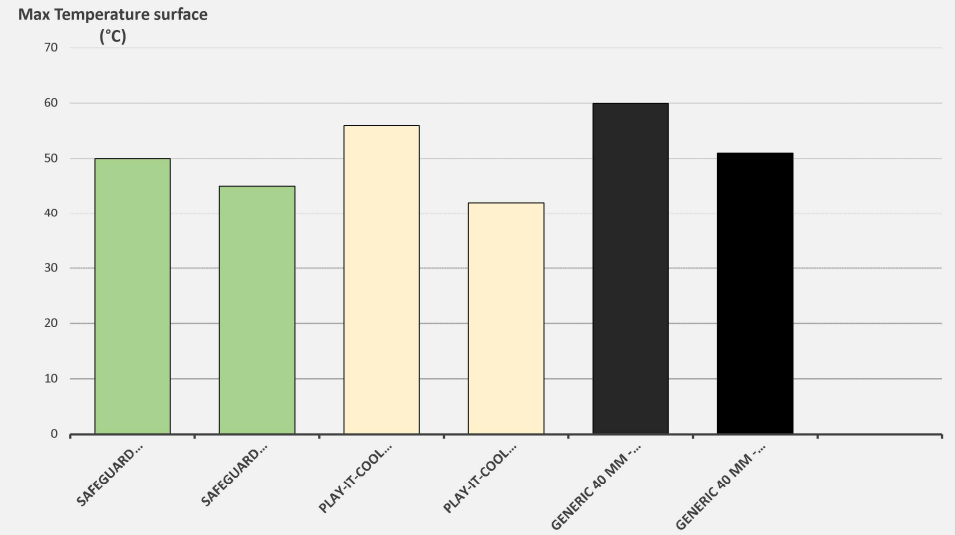
Note: The lowest max temperature, the better

FIFA sorts infills per category. It is relevant to keep in mind results are for information only (no pass/fail) as not a significant difference is noticed from one type of infill to another

HEAT TEST – FIFA TEST METHOD 14

	Category 1	Category 1 – 2	Category 2	Category 2 – 3	Category 3
Temperature range	< 122°F < 50°C	122 - 129°F 50 - 54°C	131 - 138°F 55 - 59°C	140 - 149°F 60 - 65°C	> 149°F > 65°C

Heat Test: FIFA Test Method 14



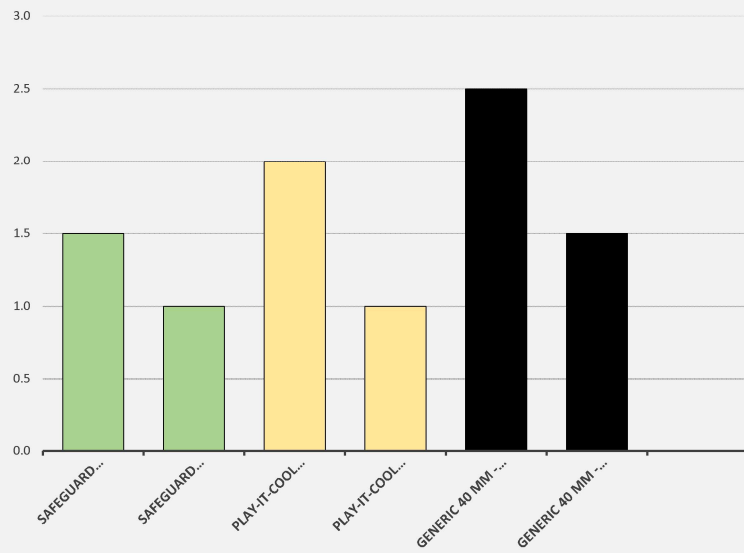
Results summary table

System tested	Max Temperature surface (°F)	FIFA Category
SAFEGUARD COLOR COATED GLASS System / Wet	122	1.5
SAFEGUARD COLOR COATED GLASS System / Dry	112	1.0
PLAY-IT-COOL ARAGONITE system / Dry	132	2.0
PLAY-IT-COOL ARAGONITE system / Wet	108	1.0
Generic 40 mm - SBR system / Dry	141	2.5
Generic 40 mm - SBR system / Wet	124	1.5

continued to next page

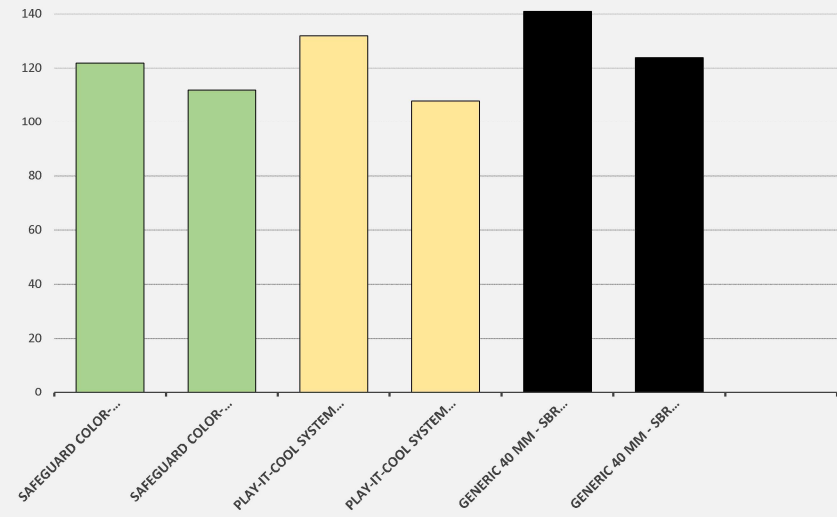
Heat Test: FIFA Test Method 14

FIFA Category



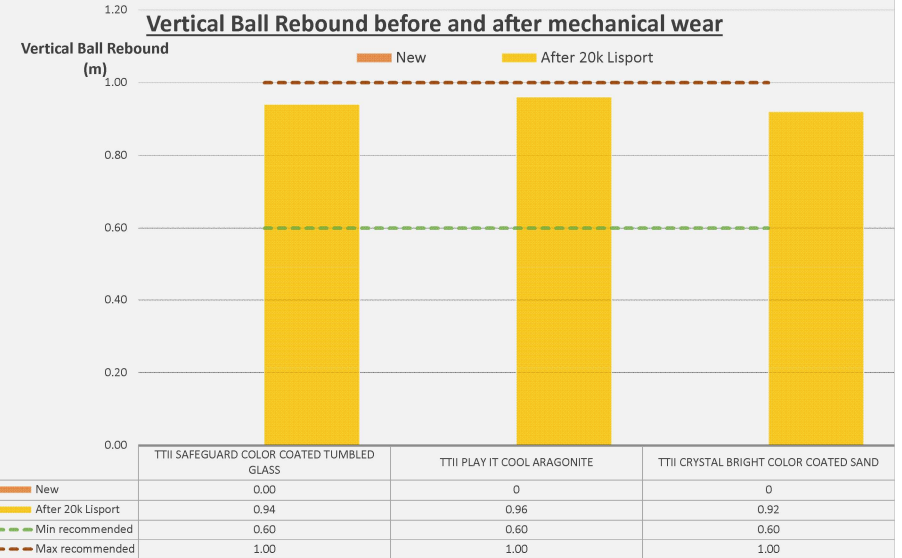
Heat Test: FIFA Test Method 14

Max Temperature
surface
(°F)



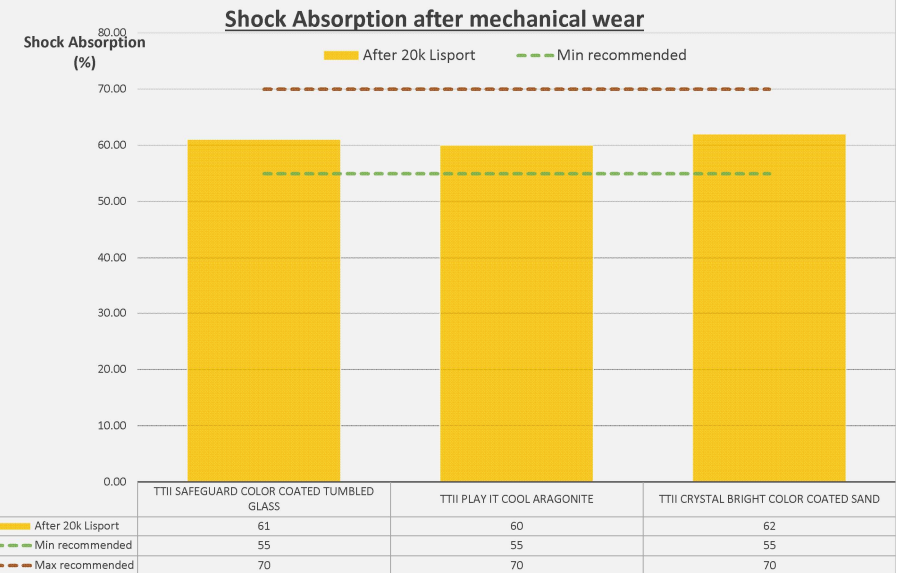
Results summary table

System tested	Vertical Ball Rebound (m)		Recommended range based on FIFA and WR requirements	
	New	After 20k Lisport	Min	Max
TTII SAFEGUARD COLOR COATED TUMBLED GLASS	-	0.94	0.60	1.00
TTII PLAY IT COOL ARAGONITE	-	0.96	0.60	1.00
TTII CRYSTAL BRIGHT COLOR COATED SAND	-	0.92	0.60	1.00



Results summary table

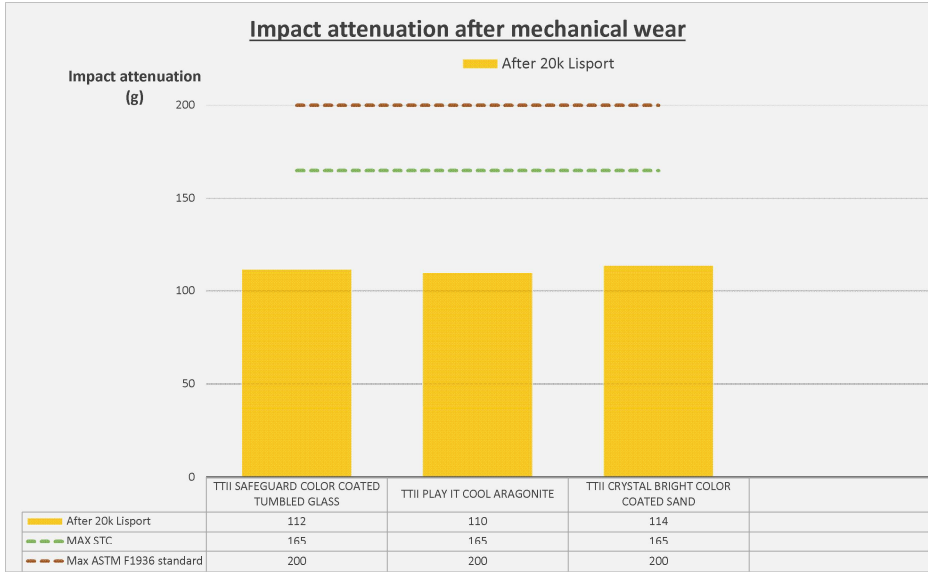
System tested	Shock Absorption (%)		Recommended range based	
	New	After 20k Lisport	Min	Max
TTII SAFEGUARD COLOR COATED TUMBLED GLASS	-	61	55	70
TTII PLAY IT COOL ARAGONITE	-	60	55	70
TTII CRYSTAL BRIGHT COLOR COATED SAND	-	62	55	70



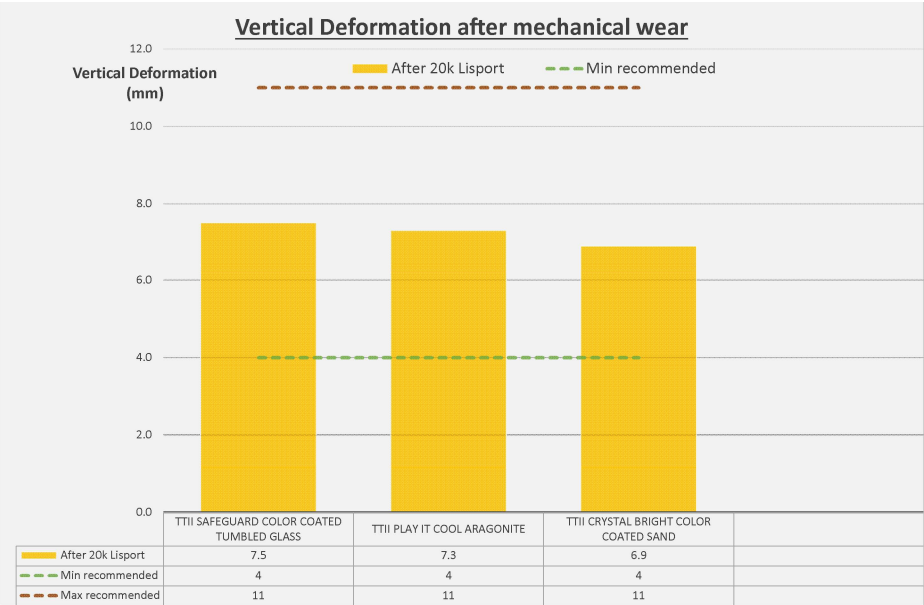
Results summary table				
System tested	Rotational Resistance		Recommended range based	
	New	After 20k Lisport	Min	Max
TTII SAFEGUARD COLOR COATED TUMBLED GLASS	-	44	25	50
TTII PLAY IT COOL ARAGONITE	-	48	25	50
TTII CRYSTAL BRIGHT COATED SAND (2022)	-	43	25	50



Results summary table				
System tested	Impact Attenuation (g)		Recommended range based	
	New	After 20k Lisport	Max STC	Max ASTM F1936 standards
TTII SAFEGUARD COLOR COATED TUMBLED GLASS	-	112	165	200
TTI CRYSTAL BRIGHT (2022)	-	110	165	200
TTII PLAY IT COOL	-	114	165	200



Results summary table				
System tested	Shock Absorption (%)		Recommended range based	
	New	After 20k Lisport	Min	Max
TTII SafeGuard Colour Coated Green Infill	-	7.5	4	11
TTII CRYSTAL BRIGHT (2022)	-	7.3	4	11
TTII PLAY IT COOL	-	6.9	4	11



ACID SUBMERSION TEST



Results summary table

System tested	Color change in Hydrochloric acid 30% solid content (after 72 h) (Greyscale Index)
TTII SAFEGUARD COLOR COATED TUMBLED GLASS	4.0
TTI CRYSTAL BRIGHT COLOR COATED SAND	4.0

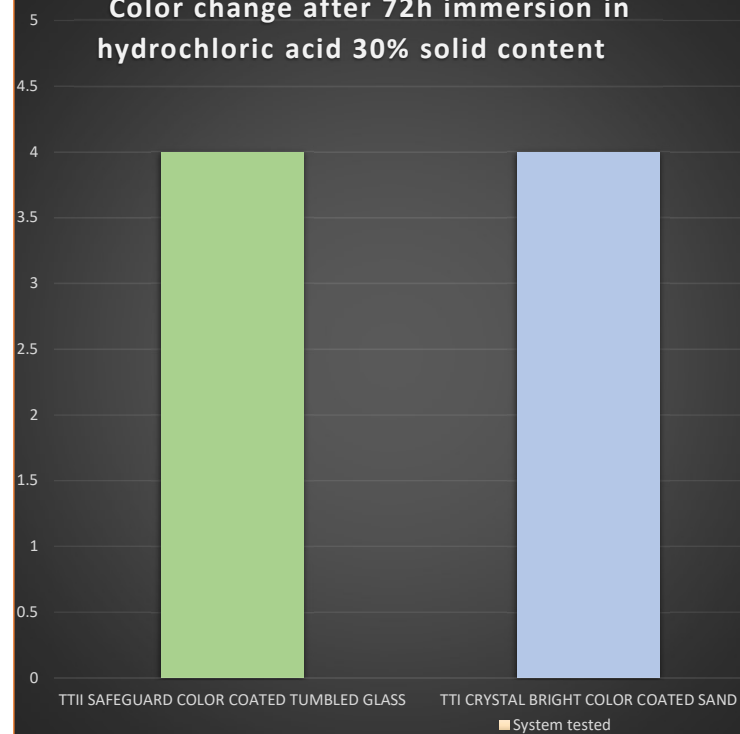
Note: The highest the color change score, the better

The Grey Scale: 1 – 1/2 – 2 – 2/3 – 3 – 3/4 – 4 – 4/5 – 5 (=No change) indicates the severity of the change of color

There are no requirements for this test

FIFA and World Rugby would require a score of 3 or higher (For UV exposure). Hence, in this sense, a similar color change for UV testing would be considered as minor

Color change after 72h immersion in hydrochloric acid 30% solid content



PERMANENT AGGLOMERATION TESTING



Results summary table

System tested	PAT (Permanent Agglomeration Temperature) Particle size	
TTII SAFEGUARD COLOR-COATED TUMBLED GLASS	0	120
TTI CRYSTAL BRIGHT COATED SAND	0	120

Results summary table

System tested	PAT (Permanent Agglomeration Temperature) Particle size	
TTII SAFEGUARD COLOR-COATED TUMBLED GLASS	0	248
TTI CRYSTAL BRIGHT COATED SAND	0	248

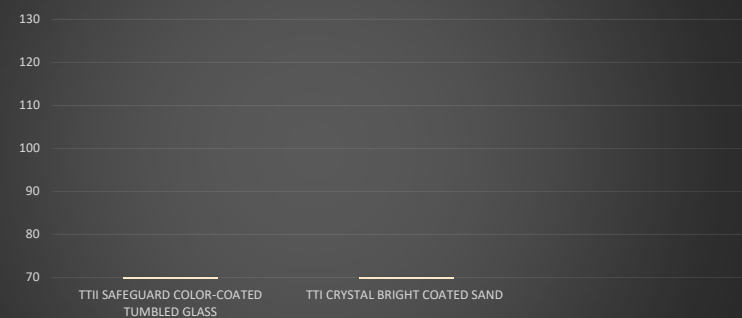
Note: The highest the PAT, the better.

The test was designed to assess agglomeration, especially on TPE at range of temperature achievable on a field.

Anything above 90-100 (°C) (or 194 - 212 (°F)) already high temperatures (above ones monitored on field) is already a good PAT result

PAT agglomeration monitoring

TEMPERATURE (°C)



PAT agglomeration monitoring

TEMPERATURE (°F)

