

Forlì, December 11th, 2015

To the attention of:

Mr. Ministry of Health, Rome, Italy and
Competent Authority for REACH and CLP (CARACAL), Brussels, Belgium

Copy to:

Competent Authorities for REACH and CLP (CARACAL)
European Consumer Consultative Group (ECCG)
DG GROWTH
DG GROWTH
DG HEALTH AND

CONSUMERS

ClientEarth, Brussels, Belgium

ChemSec, Göteborg, Sweden

WWF European Policy Office, Brussels, Belgium

BEUC Bureau Européen des Unions de Consommateurs, Brussels, Belgium

European Parents Association, Brussels, Belgium

EUROPEAN ENVIRONMENTAL BUREAU, Brussels, Belgium

GREENPEACE EU UNIT, Brussels, Belgium

Subject: classification of the rubber granules used for infill of synthetic turf within the REACH Regulation and consequences for consumers in terms of exposure to carcinogenic substances.

Dear

We are contacting you as Italy's representative within the **Competent Authorities for REACH and CLP (CARACAL)**⁽¹⁾, asking you to convey the contents of this letter to the same.

Our Company, operating since 1980 in the production of thermoplastic compounds, also produces granules for infill of synthetic turf made of virgin Thermoplastic Elastomers (TPE) which are completely non-toxic and re-usable at end-of-life.

We have been informed that during the 19th Meeting of the Competent Authorities for the REACH⁽²⁾ and CLP⁽³⁾, which was held on 12 and 13 November 2015 in Brussels, a proposal was made to qualify the **rubber infill for synthetic turf** as a **mixture** and not as an **article**. We requested a copy of the minutes of this meeting from CARACAL in order to have accurate and timely information regarding the same, but we were told that they were not yet available (e-mail dated 23/11/2015 signed by Caracal Team, GROW-CARACAL@ec.europa.eu). Consequently, we have had to base this letter on word of mouth, referred by persons present at the aforesaid meeting; it therefore may contain inaccuracies or personal interpretations regarding the discussion which took place.

1. THE PROPOSAL - According to the information we have collected, during the CARACAL Meeting held on 12 November 2015, partly behind closed doors, the ETRMA European Tyre and Rubber Manufacturers' Association, representing tyre production and recycling companies, with the support of the Competent Authority representing the Netherlands as Member State, would have made a proposal aimed at qualifying the **rubber infill** for synthetic turf as a **mixture** (covered by paragraph 28 of Annex XVII⁽⁴⁾ of the REACH regulation) and not as an **article** (covered by paragraph 50 of Annex XVII).

TABLE 1. DEFINITIONS

ACCORDING TO REGULATION (CE) N° 1907/2006 (REACH) | CHAPTER 2. DEFINITIONS AND GENERAL PROVISION | ARTICLE 3. DEFINITIONS

ARTICLE	MIXTURE
An object which during production is given a special shape, surface or design which determines its function to a greater degree than does its chemical composition.	A mixture or solution composed of two or more substances.
The PAH (Polycyclic Aromatic Hydrocarbons) content of the articles is governed by the REACH REG. - ANNEX XVII - PARAGRAPH 50.	The PAH (Polycyclic Aromatic Hydrocarbons) content of the mixtures is governed by the REACH REG. - ANNEX XVII - PARAGRAPH 28.
The maximum limit for each PAH is established by Reg. (EU) 1272/2013(5) which will come into force on 27 December 2015.	

2. THE APPLICATION-RELATED CONSEQUENCES – This interpretation of the Regulation, which would be applied both to crumb rubber from post-consumer tyres and to virgin thermoplastic elastomer granules like those produced by our company, would allow to remove the **rubber infill** from the sphere of application of the Regulation (EU) N. 1272/2013, which will come into force on 27/12/2015 and which establishes the maximum limit allowed for 8 PAHs as: 1 mg/kg for articles intended for use by the public and 0.5 mg/kg for articles intended for use in children's products. **Should the rubber infill for synthetic turf – whether in virgin thermoplastic elastomer or rubber recovered from ground tyres – be considered a mixture rather than an article, it could benefit from PAH limits 100 to 1000 times higher**, as can be seen in the table below.

N°	PAHs	CLASS OF CARCINOGENICITY	ARTICLES ⁽⁷⁾		MIXTURES ⁽⁸⁾	
			mg/kg	% ⁽⁹⁾	mg/kg	% ⁽⁹⁾
1	(a) Benzo[a]pyrene(BaP)	1B	⁽¹⁰⁾ 1 / 0,5	0,0001 % / 0,00005%	100	0,01 %
2	(b) Benzo[e]pyrene(BeP)	1B	1 / 0,5	0,0001 % / 0,00005%	1000	0,1 %
3	(c) Benzo[a]anthracene(BaA)	2	1 / 0,5	0,0001 % / 0,00005%	1000	0,1 %
4	(d) Chrysene(CHR)	1B	1 / 0,5	0,0001 % / 0,00005%	1000	0,1 %
5	(e) Benzo[b]fluoranthene(BbFA)	1B	1 / 0,5	0,0001 % / 0,00005%	1000	0,1 %
6	(f) Benzo[j]fluoranthene(BjFA)	1B	1 / 0,5	0,0001 % / 0,00005%	1000	0,1 %
7	(g) Benzo[k]fluoranthene(BkFA)	1B	1 / 0,5	0,0001 % / 0,00005%	1000	0,1 %
8	(h) Dibenzo[a,h]anthracene(DBAhA)	1B	1 / 0,5	0,0001 % / 0,00005%	100	0,01 %

⁽⁷⁾ ARTICLES: list of PAHs subject to restrictions mentioned in Annex XVII of the REACH Regulation, paragraph 50. The maximum content of each PAH is established by the Reg. (EU) 1272/2013.

⁽⁸⁾ MIXTURES: carcinogenic substances mentioned in Annex XVII of the REACH Regulation, paragraph 28. The maximum content of each PAH is established by the REACH Regulation.

⁽⁹⁾ Percentage of the weight of each component

⁽¹⁰⁾ 1 mg/kg for articles intended for use by the public and 0.5 mg/kg for articles intended for use in children's products.

3. CARCINOGENICITY – Many studies have investigated the potential danger of rubber infill obtained from **ground tyres**, since their high content of hazardous substances has repeatedly raised the concern of the public and institutions. Of the many studies carried out on this subject, we would like to mention the one published in 2014 in the Journal of Environmental & Analytical Toxicology entitled "Release of Polycyclic Aromatic Hydrocarbons and Heavy Metals from rubber Crumb in Synthetic Turf Fields: Preliminary Hazard Assessment for Athletes" by Letizia Marsili et al. (annex 2) **which analyses and reports the PAH content of 9 randomly selected samples of infill rubber from grinded tyres**. We have copied the data of the article in the table below, comparing it with the limits established by the REACH Regulation, both for articles and mixtures.

CARCINOGENICITY*	PAHs	SAMPLE 1	SAMPLE 2	SAMPLE 3	SAMPLE 4	SAMPLE 5	SAMPLE 6	SAMPLE 7	SAMPLE 8	SAMPLE 9	ARTICLES REACH XVII.50	MIXTURES REACH XVII.28
		ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	mg/kg=ng/g	mg/kg=ng/g
	Naphthalene	774.28	2039.61	360.19	804.53	424.87	246.14	407.59	223.32	1136.00		
	Acenaphthene	7297.50	10148.88	352.12	4200.53	416.15	405.31	1309.41	508.71	6321.31		
	Fluorene	10367.21	11025.47	426.81	1347.92	4944.42	1152.60	528.52	1665.02	7145.12		
	Phenanthrene	708.74	1160.10	146.90	1560.01	149.00	247.79	76.03	37.92	1013.08		
	Anthracene	80.30	138.12	38.25	282.62	44.56	76.39	7.64	34.59	182.28		
	Fluoranthene	2939.37	3740.04	872.96	1979.53	2243.22	710.43	993.99	817.50	3244.74		
	Pyrene	5670.11	6729.04	3983.32	5974.83	3800.41	1643.56	2144.43	1909.15	10280.99		
2	Benzo(a)anthracene	1166.03	1612.58	92.28	440.21	267.10	115.46	41.37	5.38	389.40	1 / 0.5	1000
1B	Chrysene	2898.05	3422.21	923.00	1396.91	700.38	243.57	921.07	622.18	916.56	1 / 0.5	1000
1B	Benzo(b)fluoranthene	11103.33	15715.42	1149.65	4569.85	1563.07	1899.14	1248.07	1440.33	10185.76	1 / 0.5	1000
1B	Benzo(k)fluoranthene	679.05	1203.44	68.25	504.87	353.09	126.77	224.24	611.64	3615.88	1 / 0.5	1000
1B	Benzo(a)pyrene	256.10	464.58	119.81	229.96	165.92	265.10	60.28	51.72	662.56	1 / 0.5	100
1B	Dibenz(a,h)anthracene	464.36	362.12	192.90	72.75	426.97	344.52	109.13	134.76	573.26	1 / 0.5	100
	Benzo(g,h,i)perylene	902.89	449.76	395.63	418.68	585.24	543.82	239.69	344.92	475.49		
	Total	PAHs	45307.32	58211.37	9122.05	23783.19	16084.40	8020.60	8311.45	8407.13		
	Carcinogenic	PAHs	16566.92	22780.35	2545.89	7214.55	3476.52	2994.56	2604.16	2866.02		

As you can see, all 9 samples analysed in the article contain PAHs values which exceed the limits set by the Regulations, even those applied to the mixtures (remember that mixtures are subjected to less restrictive limits than those applied to articles as of 27/12/2015) and we can therefore conclude that **all 9 samples of crumb rubber analysed in the article would be "carcinogenic mixtures", as stated by Regulation (EU) 1272/2008 CLP:**

"3.6.3.1.1. The mixture will be classified as a carcinogen when at least one ingredient has been classified as a Category 1A, Category 1B or Category 2 carcinogen and is present at or above the appropriate generic concentration limit as shown in Table 3.6.2 for Category 1A, Category 1B and Category 2 respectively."

REG. (EU) 1272/2008 CLP, ANNEX 1- PROVISIONS RELATIVE TO THE CLASSIFICATION AND LABELLING OF HAZARDOUS SUBSTANCES AND MIXTURES | 3.6. CARCINOGENICITY | TABLE 3.6.2 GENERAL CONCENTRATION LIMITS OF COMPONENTS OF A MIXTURE CLASSIFIED AS CARCINOGENIC WHICH DETERMINE THE CLASSIFICATION OF THE MIXTURE

The article published in J.E. & A. Toxicology also reports other important data regarding the content of **heavy metals** in the 9 samples analysed; data which we will compare with the various reference regulations before long.

4. OUR POINT OF VIEW REGARDING THE CLASSIFICATION OF THE RUBBER USED FOR INFILL IN THE REACH REGULATION – In our opinion there are no conditions for qualifying the rubber infill used for synthetic turf as a mixture instead as an article, for the following reasons:

- 4.1 the infill granules are not intended for further transformations; they assume their special shape through the production process, after which they are **ready for use** and are installed in the artificial grass, where they perform their cushioning function;
- 4.2 the shape of the rubber infill granules is certainly more important than the chemical composition for the purpose of their function: this is demonstrated by the fact that FIFA, which is the world's leading authority in the regulation of artificial pitches, in its publication "FIFA Quality Programme for Football Turf. Handbook of Requirements - October 2015 Edition" (annex 3) does not **prescribe any requirement regarding the chemical composition of the infill granules**, while, on the contrary, it strictly governs their shape (granule size, dimensions, diameter, bulk density). The ground granules that do not correspond to the shape and dimension criteria expressed by FIFA are discarded by the manufacturers and cannot be installed in artificial surfaces. **Therefore, while the chemical composition of the infill granules does not constitute criterion for exclusion, their shape is not only more important than the chemical composition regarding functionality, but is actually a discriminating criterion with respect to the possibility of use in artificial pitches.**
- 4.3 As also confirmed in writing by the Italian REACH Helpdesk (annex 4), which we contacted for clarifications, in normal or reasonably foreseeable conditions of use, the infill granules come into direct and continuous contact with human skin or with the oral cavity and any hazardous substances can be transferred to the players through the skin, inhalation and, rarely, also through ingestion. **Since the aim of the REACH Regulation is to protect the consumer's health, we find it irrelevant for the purpose of the Regulation whether these objects are made available to the consumer through a professional or retail channel, while it seems very relevant that the rubber infill is used directly by the public, in particular by children and young people, during their sporting activities.**

5. CONCLUSIONS

- 5.1 Even if one wanted to force the interpretation, erroneous in our opinion, that the artificial turf infill is a mixture instead of an article in order to allow infill rubber obtained from the grinding of post-consumer tyres to benefit from higher PAH limits, **it would not be possible to put many of these products onto the market, as they would be "carcinogenic mixtures"** as resulting from the data given in Table 3, through comparison of the PAHs content of the 9 random samples of ground infill with the limit values (even the highest) set by the REACH Regulation. Rather, controls on the crumb rubber available on the market and installed in pitches must be increased to check their PAH content.
- 5.2 Attention must also be paid to preventing **legislative paradoxes**, such as, on the one hand, prohibiting disposal of tyres via landfilling, for obvious and correct environmental reasons, but, on the other hand, allowing for use of ground tyres (which are in the best conditions to release hazardous substances) inside artificial football pitches, in direct contact with the public and young children. We estimate that there are approximately 6,000 artificial pitches infilled with crumb rubber in Europe as of today and that approx. 600 new pitches are built every year.
- 5.3 We are aware that the disposal of 3.2 million tons of post-consumer tyres generated annually in Europe is a very important issue for the European industry and Institutions, but we believe that a method that is safe **beyond all doubt** must be found for the re-use of these materials. Since the mission of the REACH Regulation is also to **enhance the competitiveness of the European chemical industry**, we suggest innovative methods for the recycling of tyres are investigated, such as, for example, **selective pyrolysis and depolymerisation**. These technologies allow to break up tyres into various solid, liquid and gaseous components, which are re-usable for the production of energy or which can be recovered as raw materials.
- 5.4 **Circular Economy.** The topic of recycling and re-introduction of hazardous substances into the environment (deca-BDE, SVHC Substances of Very High Concern) has already been raised by various observers and non-governmental organisations in relation to the European Plan for Circular Economy. It is evident that the re-circulation of toxic and/or pollutant substances originating from the recovery of post-consumer products can only generate new opportunities for pollution and/or poisoning of new subjects, and that the only way to create a truly sustainable framework for future generations is that we start today to concretely innovate mentality and processes in the direction of the total elimination of hazardous substances from the production and consumption circle. Only by breaking this vicious circle can a virtuous circle be triggered.
- 5.5 Considering the importance that we attach to the topics dealt with in this letter, in the interest of public opinion, we believe it is correct to spread this information to associations and interest groups at a European level, in the attempt to highlight a subject which, unfortunately, is known only by a restricted group of persons.

Dear Dr. Pistolese, we thank you along with all members of the CARACAL Commission, not only for your attention, but also for the commitment and continuous mediation effort made in performing your delicate job, which have made it possible to develop in Europe the most advanced legislation in the field of health and the environment protection.

Yours Sincerely,

ANNEXES

- Annex 1. Notes – Reference Regulations and Terminology
- Annex 2. "Release of Polycyclic Aromatic Hydrocarbons and Heavy Metals from rubber Crumb in Synthetic Turf Fields: Preliminary Hazard Assessment for Athletes" by Letizia Marsili et al., Journal of Environmental & Analytical Toxicology, 2014
- Annex 3. FIFA Quality Programme for Football Turf. Handbook of Requirements. October 2015 Edition
- Annex 4. Opinion of REACH Helpdesk, Italy, dated September 25th, 2015

CONTACT

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ALLEGATO 1. NOTE - RIFERIMENTI E TERMINOLOGIA		ANNEX 1. NOTES - REFERENCES AND TERMINOLOGY	
(1)	<p>Autorità Competenti per il REACH e CLP (abbreviato in: CARACAL)</p> <p>CARACAL è un gruppo di esperti che consiglia la Commissione europea e l'ECHA su questioni relative a REACH e CLP. CARACAL è composto da rappresentanti delle Autorità Competenti degli Stati Membri per il REACH e CLP, rappresentanti delle autorità competenti dei paesi del SEE-EFTA, nonché un certo numero di osservatori provenienti da paesi non UE, le organizzazioni internazionali e le parti interessate.</p>	<p>Competent Authorities for REACH and CLP (in short: CARACAL)</p> <p>CARACAL is an expert group which advises the European Commission and ECHA on questions related to REACH and CLP. CARACAL is composed of representatives of Member States competent authorities for REACH and CLP, representatives from competent authorities of EEA-EFTA countries as well as a number of observers from non-EU countries, international organisations and stakeholders.</p>	
(2)	<p>REACH = REGOLAMENTO (CE) N. 1907/2006 DEL PARLAMENTO EUROPEO E DEL CONSIGLIO del 18 dicembre 2006 concernente la registrazione, la valutazione, l'autorizzazione e la restrizione delle sostanze chimiche (REACH).</p> <p>REACH è un regolamento dell'Unione europea adottato per migliorare la protezione della salute dell'uomo e dell'ambiente dai rischi delle sostanze chimiche, stimolando nello stesso tempo la competitività dell'industria chimica europea. Il regolamento promuove altresì metodi alternativi per la valutazione dei pericoli che le sostanze comportano allo scopo di ridurre il numero di test effettuati sugli animali.</p>	<p>REACH = REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)</p> <p>REACH is a regulation of the European Union, adopted to improve the protection of human health and the environment from the risks that can be posed by chemicals, while enhancing the competitiveness of the EU chemicals industry. It also promotes alternative methods for the hazard assessment of substances in order to reduce the number of tests on animals</p>	
(3)	<p>CLP = REGOLAMENTO (CE) N. 1272/2008 DEL PARLAMENTO EUROPEO E DEL CONSIGLIO del 16 dicembre 2008 relativo alla classificazione, all'etichettatura e all'imballaggio delle sostanze e delle miscele che modifica e abroga le direttive 67/548/CEE e 1999/45/CE e che reca modifica al regolamento (CE) n. 1907/2006</p> <p>Il regolamento CLP garantisce che i rischi presentati dalle sostanze chimiche siano chiaramente comunicati ai lavoratori e ai consumatori nell'Unione europea attraverso la classificazione e l'etichettatura delle sostanze chimiche.</p>	<p>CLP = REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006</p> <p>The CLP Regulation ensures that the hazards presented by chemicals are clearly communicated to workers and consumers in the European Union through classification and labelling of chemicals.</p>	
(4)	<p>ALLEGATO XVII del REACH, REGOLAMENTO (CE) N. 1907/2006, contiene le RESTRIZIONI IN MATERIA DI FABBRICAZIONE, IMMISSIONE SUL MERCATO E USO DI TALUNE SOSTANZE, MISCELE E ARTICOLI PERICOLOSI</p>	<p>ANNEX XVII of REACH REGULATION (EC) No 1907/2006 contains the RESTRICTIONS ON THE MANUFACTURE, PLACING ON THE MARKET AND USE OF CERTAIN DANGEROUS SUBSTANCES, MIXTURES AND ARTICLES</p>	
(5)	<p>REGOLAMENTO (UE) N. 1272/2013 DELLA COMMISSIONE del 6 dicembre 2013 recante modifica dell'Allegato XVII del regolamento (CE) n. 1907/2006 del Parlamento europeo e del Consiglio concernente la registrazione, la valutazione, l'autorizzazione e la restrizione delle sostanze chimiche (REACH) per quanto riguarda gli idrocarburi policiclici aromatici (IPA). In vigore dal 27 dicembre 2015</p>	<p>COMMISSION REGULATION (EU) No 1272/2013 of 6 December 2013 amending Annex XVII to Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as regards polycyclic aromatic hydrocarbons (PAHs). In force from December 27, 2015</p>	
(6)	<p>REACH CAPO 2 - Definizioni e disposizione generale Articolo 3 - Definizioni Ai fini del presente regolamento, si intende per:</p> <p>1. sostanza: un elemento chimico e i suoi composti, allo stato naturale o ottenuti per mezzo di un procedimento di fabbricazione, compresi gli additivi necessari a mantenerne la stabilità e le impurità deri-vanti dal procedimento utilizzato, ma esclusi i solventi che possono essere separati senza compromettere la stabilità della sostanza o modificarne la composizione;</p> <p>2. miscela: una miscela o una soluzione composta di due o più sostanze;</p> <p>3. articolo: un oggetto a cui sono dati durante la produzione una forma, una superficie o un disegno particolari che ne determinano la funzione in misura maggiore della sua composizione chimica;</p>	<p>REACH CHAPTER 2 - Definitions and general provision Article 3 - Definitions For the purposes of this Regulation:</p> <p>1. substance: means a chemical element and its compounds in the natural state or obtained by any manufacturing process, including any additive necessary to preserve its stability and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition;</p> <p>2. mixture: means a mixture or solution composed of two or more substances;</p> <p>3. article: means an object which during production is given a special shape, surface or design which determines its function to a greater degree than does its chemical composition;</p>	