

EVALUATION OF HEALTH RISKS OF PLAYING SPORTS ON SYNTHETIC TURF PITCHES WITH RUBBER GRANULATE

Published by
Dutch National Institute for Public Health and the Environment (RIVM)

This investigation has been performed by order and for the account of the Dutch Ministry of Health, Welfare and Sport, within the framework of project V/050313 – Rubber granulate in synthetic turf pitches.

To reference this report use: DOI [10.21945/RIVM-2017-0016](https://doi.org/10.21945/RIVM-2017-0016)

Synopsis

New research by the Dutch National Institute for Public Health and the Environment (RIVM) indicates that the health risk of playing sports on synthetic turf fields with an infill of rubber granulate is virtually negligible. Therefore, it is considered safe for people to play sports on such fields. The research was conducted following public concerns prompted by the Dutch TV programme Zembra called 'Dangerous Play' in October 2016. RIVM hopes that the results of the research will help to answer questions from ministries, municipalities, sports clubs and parents.

To evaluate the health risks of playing sports on rubber granulate, it is important to determine which harmful substances are contained in the granulate and to what extent they may be released. Subsequently, it should be examined how people playing sports can come into contact with these substances and whether this can lead to health effects. Rubber granulate contains numerous substances, such as polycyclic aromatic hydrocarbons (PAHs), metals, plasticisers (phthalates) and bisphenol A (BPA). These substances were found to be released from the granulate in very low quantities. This is because the substances are more or less 'enclosed' in the granulate, which means that the effect of these substances on human health is virtually negligible.

What did RIVM investigate?

RIVM determined the substances in rubber granulate from 100 sports fields that are representative of the synthetic turf fields in the Netherlands. The institute further performed three types of laboratory tests to examine the release of substances from the granulate if a person playing sport comes into contact with them. These 'migration studies' were used to assess to which extent substances can enter the human body via the skin, via the gastrointestinal tract or via the lungs. This was used to calculate human exposure to the released substances and how this can affect health. In addition, RIVM studied the information available in the scientific literature on substances in rubber granulate, their properties and their health effects.

Is there a link with leukaemia?

No indications were found in the available literature of a link between playing sports on synthetic turf fields with an infill of rubber granulate and the incidence of leukaemia and lymph node cancer. No international research has demonstrated this connection. Moreover, it is clear from the composition of the rubber granulate that the chemical substances that are capable of causing leukaemia or lymph node cancer are either not present (benzene, styrene and 1,3-butadiene) or are present in a very low quantity (2-mercaptobenzothiazole). Since the 1980s, a slight rise has been observed in the number of people aged between 10 and 29 who get leukaemia. This trend has not changed since fields made of synthetic turf were

first used in the Netherlands in 2001. Nor does research conducted in America reveal any increase in the number of new cases of lymph node cancer in areas where there are relatively many fields with synthetic turf with an infill of rubber granulate.

Information from new American research will be available early 2017. As rubber granulate has been used on football fields in the United States for a longer period of time (since 1997), it will be possible to analyse over a longer period whether a link exists between playing sports on synthetic turf fields and getting leukaemia. RIVM is in contact with the researchers and is keeping a sharp eye on the research.

Rubber granulate in the environment

This research focuses on potential health risks for people who play sports on synthetic turf fields with an infill of rubber granulate. The research confirms earlier insights showing that the rubber granulate contains metals capable of entering the environment. In particular, zinc was found to be released from the granulate. This metal is not harmful to humans, but can have consequences for organisms in the soil or surface water.

Does rubber granulate meet requirements?

Rubber granulate is required to satisfy the legal requirements for 'mixtures'. This standard prescribes the maximum permissible amount of certain substances allowed in rubber granulate (there is no standard for how much may be released). This standard concerns substances that are carcinogenic (such as PAHs), harmful for reproduction or that damage DNA. The quantity of PAHs in rubber granulate easily satisfies this standard. The standard for consumer products is far more stringent: it allows far lower quantities of PAHs (100 to 1000 times lower) compared with the standard for mixtures. The quantity of PAH in rubber granulate is slightly higher than the standard for consumer products. The European Chemicals Agency (ECHA) is currently conducting research to determine a suitable standard for rubber granulate. RIVM recommends adjusting the standard for rubber granulate to one that is closer to the standard applicable to consumer products.

Why is rubber granulate used for football pitches?

Rubber granulate is finely crushed rubber particles that are usually made from old car tyres. When used as infill on fields of synthetic turf, it gives the field properties similar to normal turf. It means the ball does not roll too fast and does not bounce too high, and makes the synthetic turf better suited to sliding tackles than it would be without the granulate. Synthetic turf fields can be used intensively all year around and need less maintenance.

A lot is invested nowadays in order to reuse old products as a raw material for new products. This also applies to car tyres. The questions that have arisen about the safety of rubber granulate show that tension may exist between the reuse of materials and concerns about the health risks of new products.