

THE MATERIALS SCIENCE OF ATHLETICS TRACKS

THE 2020 OLYMPICS ATHLETICS TRACK

The Tokyo 2020 Olympics use a specially designed track surface made from rubber. Rubber is an elastomeric polymer: it returns to its original shape when it is deformed.

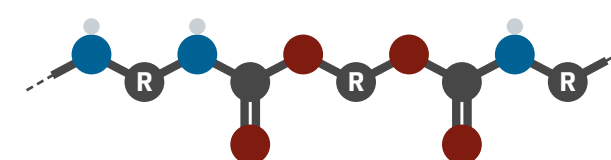


KEY:
● Carbon
● Hydrogen

SECTION OF NATURAL RUBBER'S REPEATING STRUCTURE

OTHER TYPES OF TRACK

Other types of running track bind rubber particles with a polyurethane polymer over an asphalt base. Polyurethane track surfaces are commonly used for school and community tracks.

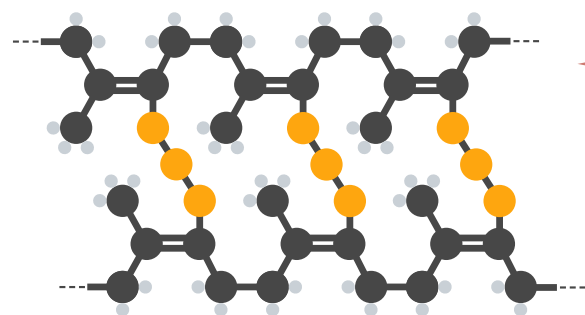


● Carbon
● Oxygen
● Nitrogen
● Variable
● Hydrogen

SECTION OF POLYURETHANE'S REPEATING STRUCTURE

VULCANISED RUBBER LAYERS

Vulcanisation (treatment of rubber with sulfur) increases rubber's rigidity by forming cross-links between sections of the polymer chains. Semi-vulcanised rubber granules form molecular bonds with the vulcanised rubber matrix, improving elasticity and shock absorption.



SECTION OF VULCANISED RUBBER

● Carbon
● Hydrogen
● Sulfur

EMBOSED SURFACE

The texture of the track surface improves slip resistance and traction. The approach, known as non-directional tessellation, helps water drain from the surface and enhances grip.

EMBEDDED AIR CELLS

The bottom layers are shaped into elongated honeycombs, which deform in three directions to help with shock absorption. Air cells embedded in the honeycombs absorb impact when compressed and help athletes bounce off the surface.

RUBBER GRANULES

