

ARTIFICIAL TURF WITH UPSTANDING QUALITIES

Problem – Challenge

The first generation of artificial turf was manufactured using polyamide fibers with excellent recovery properties and which always stood upright. But it was exactly these resistant fibers which frequently led to grass burns and abrasions whenever someone took a tumble. That's why second-generation fibers consisted of polyethylene whose properties were much gentler on the skin. In practical use, however, these fibers exhibited a serious defect: the ability to return upright after repeatedly being trampled upon, was very poor. Over time, the load on the fibers led to a downright flat pitch. This was not only visually unattractive, but the "bent over" blades of the artificial grass also affected how well the turf could be played on. As a result, an attempt was made to support the blades with sand or granulated material, but this needed a lot of maintenance.



Solution

The new fiber exhibits high resilience as well as optimal sliding friction behavior. It contains a hard polyamide core surrounded by a low-friction sheath of polyethylene. Various cross-sections of the fiber have been modeled. The initial idea that the fiber should contain only one thick core failed. This fiber did not pass the Lisport test, which checks for long-term mechanical wear. With trial and error the project team of Empa and ETH Zürich together with the industry partners Tisca Tiara and the filament producer Schramm GmbH finally succeeded in creating the optimal cross-section within a project financed by the Commission for Innovation and Technology (CTI). Instead of one core, the fiber boasts five thin ones. The fiber's resilient qualities are guaranteed for years, as the Lisport test was able to prove.

