



## Artificial turf infill solutions

**Holo, Terra, Forgrin**

## More solutions for turf systems

Benvic is pleased to introduce the Xtended series TPE Infill solutions, offering a range of three products.

The 3rd generation Artificial Turf (AT) is distinguished by longer fibres ranging from 40 to 60 mm in height and by use of the so called performance infill granules strewn between the fibres, so that the shoe studs can find the right foothold.

The performance infill consists of elastomeric granules made of thermoset rubbers or specially designed Thermoplastic Elastomers (TPE).

The main difference between the two types of infill is that thermoset rubbers cannot be further reused or reprocessed at the end of their life cycle while Thermoplastic Elastomers are fully recyclable and can be reused and transformed several times.

There are two main AT systems:

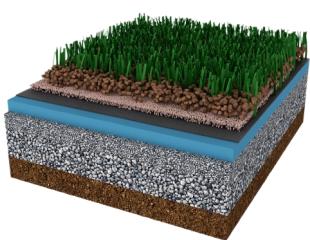
\* the first type, without shock pad or e-layer is characterised by:

- Long pile height from 50 to 70 mm,
- sand layer from 10 to 15 mm,
- infill layer from 25 to 35 mm.



\* the second type is made with a shock pad or e-layer and is characterised by:

- shorter pile height from 40 to 50 mm,
- sand layer from 10 to 15 mm,
- infill layer from 8 to 15 mm.



The use of the shock pad or e-layer beneath the turf carpet confers elasticity to the playing surface and allows the reduction of the infill layer and the use of shorter grass fibres, all of which reduces the overall construction costs.

Both techniques enable excellent sports performance and also comply with FIFA Quality Concept guidelines.

3rd generation Artificial Turf (AT) can be used for Soccer, American Football and Rugby.



The infill is a key element in the artificial turf system, because it sets the quality and performance characteristics of the playing surface.



**Smooth & Safe** for the skin in order to prevent burns, contribute to the sliding performance and help the studs of the player's shoes to find their foothold.



**UV resistance** color resistance against ageing factors sunlight, ozone and rain.



**Safe** for the environment and the health of the players.



**Color on demand** and wide existing color range.



**Dimensional stability** against thermal stresses.



**Shock absorption** improved ball bounce, torsion.



**Compression** recovery time modulation, aids the fibers in bending back to their original position.



**Fire resistance**



**Halogen Free**



**Oxidation resistant**

	<i>Holo</i>	<i>Forgrin</i>	<i>Terra</i>
<b>Shape</b>	Cylindrical, hollow inside	Cylindrical	Cylindrical
<b>Bulk density, g/cm<sup>3</sup> <sup>(1)</sup></b>	0.55	0.85	0.85
<b>Infill quantity, kg/m<sup>2</sup> <sup>(2)</sup></b>	5.0	7.7	7.7
<b>Granule to infill 1 football pitch, kg <sup>(3)</sup></b>	35.700	54.978	54.978
<b>Shock absorption<sup>(4)</sup> as new</b>	66%	63%	63%
<b>Shock absorption<sup>(4)</sup> after 20K cycles</b>	65%	62%	62%

All above figures show the typical values for an artificial system with a shock pad underlay, e.g.: 12 mm shock pad, 45 mm turf system with 15 mm infill sand and 10 mm performance infill.

(1) Density: the ratio of the mass of a body and its volume. The bulk density of a material is calculated in a way similar to absolute density but takes into consideration the total volume occupied by the solid, including the hollow spaces (solids with closed cavities, open cavities or spongy structures).

(2) The kg/m<sup>2</sup> data indicate the quantity of granules needed to obtain 10mm infill height per square meter.

(3) Data for the infill of a field of standard dimensions (105x68 m = 7,140 m<sup>2</sup>) for a 10 mm high infill layer.

(4) Data measured according to the FIFA Quality Concept method.



## Holo - Advanced infill technology

HOLO® is the **most advanced infill product** available on the market.

Its high profile characteristics rely on the combination of two elements:

- The **innovative cylindrical shape** with hollow space inside the granule, which makes possible its **“shock-absorption”** function (worldwide patent).
- The **engineered compound formulation** offering a perfect balance of elasticity and resilience, which allows the granule to return to its original shape after the impact.

Compared to the other infill materials HOLO® provides a **“natural feeling”** never experienced before on artificial surfaces.

Range	Exposure (kLangley/year)	Applications	Benefits	Certification
<b>HOLO SP-D INDOOR</b>	Indoor			FIFA Quality Concept
<b>HOLO SP</b>	≤ 130	Performance infill		FIFA Quality Concept DIN 18035-7:2013-6
<b>HOLO SP-D (I)</b>	≤ 130	Complying with the most stringent environmental norms		Dutch Soil Quality Decree
<b>HOLO XT</b>	≤ 160			LND Regulation (Italian amateur soccer league)
<b>HOLO GT</b>	≤ 200			FIFA Quality Concept

(I) The only difference between Holo® SP and Holo® SP-D is that the latter is certified according to the Dutch Soil Quality Decree (Besluit Bodemkwaliteit) which sets severe rules and tight controls on building materials in order to prevent the pollution of soil and water. Holo® SP-D is supplied with an environmental statement which is checked and approved by the Dutch Government. SO.F.TER. is currently the only infill supplier that has obtained this certification following an inspection of the whole production cycle by INTRON Certification Institute on behalf of the Dutch Government.

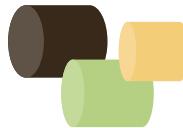


## Terra - Eco-friendly certified infill

The TERRA® products, designed to grant maximum playing comfort and environmental safety, are certified according to the most stringent environmental regulations.

Range	Exposure (kLangley/year)	Applications	Benefits	Certification
<b>TERRA XPS INDOOR</b>	Indoor			EN 13501-1:2002 Class Cfl NEN 1775:1997 Class T1
<b>TERRA XPS</b>	≤ 130			FIFA Quality Concept Dutch Soil Quality Decree EN 71-3 Safety toys

Technical data sheets, processing recommendations and other supporting data are available upon demand. The information given here above is general commercial information, cannot be considered as a specification can change without prior notice. Benvic also supports customers through continuous adaptation of its products: please contact your nearest sales representative for technical support.



## Forgrin - Sports performance for every condition

The wide range of FORGRIN® products is designed for use in different climatic conditions, and can be installed in fields exposed to the coldest as well as the hottest weathers in the world.

Range	Exposure (kLangley/year)	Applications	Benefits	Certification
<b>FORGRIN HT INDOOR</b>	Indoor			
<b>FORGRIN HT</b>	≤ 130	Performance infill		FIFA Quality Concept EN 71-3 Safety toys
<b>FORGRIN HT 140</b>	≤ 140	Performance infill		FIFA Quality Concept
<b>FORGRIN XT</b>	≤ 160			LND Regulation (Italian amateur soccer league)
<b>FORGRIN GT</b>	≤ 200			FIFA Quality Concept

**Product chart  
by exposure  
zone**



Exposure	Holo	Forgrin	Terra
<b>INDOOR <sup>(1)</sup></b>	Holo SP Indoor HoloSP-D Indoor	Forgrin HT Indoor	Terra XPS Indoor
<b>≤130 kLangley/year *</b>	Holo SP HoloSP-D	Forgrin HT	Terra XPS
<b>≤140 kLangley/year *</b>	-	Forgrin HT 140	-
<b>≤160 kLangley/year *</b>	Holo XT	Forgrin XT	-
<b>≤200 kLangley/year *</b>	Holo GT	Forgrin GT	-

<sup>(1)</sup> kLangley: unit of measurement of solar radiation 1 kLangley = 1 kcal/cm<sup>2</sup> = 41.84 MJ/m<sup>2</sup> - 1 kLangley/year = 1.33 W/m<sup>2</sup>



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