

## Environmental friendliness of the TURF-products

### **TURF *activ***

#### 1. Product description

**TURF *activ*** is an energy-bearing nutrient component of three groups of molecules (sugar compound, phosphoric acid and nitrogen base). This nutrient component is an organic sugar phosphorus amide in the form of a liquid concentrate, which is diluted with water and applied for soil amelioration.

#### 2. Environmental Friendliness

**TURF *activ*** does not contain any salt - and heavy metal pollutions. The measured heavy metal contents are below the provable limits or within a sector which is allowed to food.

**TURF *activ*** does not contain any chemical harmful substances. The product decomposes in the soil without residue. Final products of the biological decomposition are CO<sub>2</sub>, H<sub>2</sub>O, NO<sub>3</sub>, NH<sub>4</sub> and P<sub>2</sub>O<sub>5</sub>.

#### 3. Precautions:

**TURF *activ*** has to be declared as a dangerous good following the German Dangerous Goods Prescription (UN 1805 Phosphoric acid, liquid, III, Class 8 Corrosive).

When watering down concentrate please make sure wearing protective goggles and gloves. (R 36 = irritates eyes; S 25 = avoid contact with eyes).

### **TURF *forte***

#### 1. Product description

**TURF *forte*** is an organic slow-release fertilizer with a soil-improving effect. It is manufactured of the mycel of the soil fungus *Penicillium chrysogenum*. Further components are bacterial bio-substances and clay minerals. After application and irrigation, the dehydrated and granulated substance serves as a slow-release source of nutrients. The clay minerals ameliorate the nutrient storage capacity.

Due to its biological nature (withered biomass of a soil fungus and soil bacteria) **TURF *forte*** has a well-balanced combination of nutrients and is therefore well adapted to the microbial decomposition process in the soil. Trials have shown that the application of **TURF *forte*** is ecologically recommendable.

The bio-substances of soil fungi and soil bacterial are dried for at least 4 hours by 110 to 130°C and therefore hygienically completely harmless. The product is free of viable germs and free of restpenicillin.

## 2. Environmental Friendliness

From the eco-toxicological point of view, **TURF forte** is harmless. As the nutrients in the dried fungus substance are for the most part organically bound and activated initially after microbial decomposition, **TURF forte** is a slow-release source of nutrients. The decomposition of organic substance depends on the balance of air, moisture and temperature of the soil. With unfavourable weather conditions - heat, cold, drought - the biological decomposition process, i. e. the release of nutrients, is considerably reduced. The nutrient requirements and absorption abilities of the plants are also reduced during periods of extreme climatic conditions. Thus, if no nutrients are released during periods of low nutrient needs there is no loss through leaching, provided that **TURF forte** was applied correctly.

The release of the nutrients of **TURF forte** takes place during favourable periods of growth through which the plants have increased nutrient requirements. The nitrogen which is organically bound in **TURF forte** is released as ammonium by microbial decomposition (oxidating disintegration). With the suitable dosing the plants will absorb the greater part of the released ammonium before the activity of the micro-organisms (nitrate-somonas and nitro-bacterium) converts this later into nitrate. This nitration is taking place at favourable growth conditions - warm temperatures, even air and water balance. These small amounts of nitrate are absorbed by the plant roots. In this way **TURF forte** assists in reducing the pollution of the soil and ground water by nitrate leakage.

## TURFS

### 1. Product description

**TURFS** is a soil stabilizer concentrate on a polymer-hydrocarbon compound basis. After the application a network of long-chained polybutadiene molecules fixes together the soil particles. This fixation cover is absolutely water permeable and can be strengthened by the use of erosion protective fibres (**TURF Ef**).

### 2. Environmental Friendliness

From the eco-toxicological point of view, **TURFS** is harmless. It contains no chloride, nitrogen, phosphor, calium, sodium, iron, cobalt, nickel, cadmium, quicksilver, zinc, copper and chrome. **TURF S** is not UV-resistant. This means that **TURFS** is decomposed oxidatively by atmospheric oxygen, warmth and sunlight (UV-radiation) to environmentally harmless H<sub>2</sub>O and CO<sub>2</sub>.