



1. Rota Brush



Rota Brush serves to **remove clean performance infill** (SBR, EPDM etc) for later reusing / reinstallation. Removal percentage (%) depends on circumstances like weather, evenness of infill, condition of artificial turf, type of turf, type of infill etc, in average 60% is removed in 1 day.

What is the weight?

Avant 640 mini loader 1590 kg + Rota Brush 200 kg

Total dimensions?

Brushing width 1500 mm

Type of fuel used?

Diesel

How is it transported?

On trailer

License needed to operate?

Yes

2. CRAB for removal



Special case studies:

Farum Park, Denmark - removal of artificial turf directly from the electrical heating system.

Allianz Park, London – rolling up Saracens Rugby artificial turf field with rolls of 15 000 kg each.

To remove (roll up) artificial turf with infill materials on metal pipes. Artificial turf is cut into 4 m rolls before rolling up operation. It's also possible to roll up without pre-cutting when the risk of damaging the heating solution with cutting exists. Infill materials in the turf act as a protection layer for subbase.



What is the weight?

Manitou 741 telehandler 8000 kg, CRAB 2000 kg

What are the dimensions of the rolls?

Width 4000 mm, length equals to the width of the football field, weight normally 10 000 kg with infill.

What is the speed of the process?

1 day for a full-size field (fastest time so far is 4 h 24 min for a 7500 m² football field)

Type of fuel used?

Diesel

Existing certificates?

CE marking

How is it transported?

On truck

Other remarks?

A truck with a crane lifts the rolls from the edge of the football field. If the truck cannot access the football stadium, Manitou and CRAB use an additional device called SHUTTLE for transporting the rolls off the field to the closest area suitable for loading onto the truck.

Does removal process damage the subbase under the artificial turf?

No, subbase or entryway are not damaged. Tested also on lava-rock subbase.

The Nominal Ground Pressure (NGP) should be considered. Total weight of the machines is 10 000 kg. The machines are developed so that the NGP to the subbase is risk-free:

1) the **surface of the tires** (contact to the ground) is bigger than on other machines used for removal. Practical experience of successful 300+ removal projects without any damages to the subbase;

2) depending on the situation we can **lower the tire pressure** and in this way decrease the NGP even more;

3) the **Manitou telehandler is not lifting the rolls, used only for giving direction and to start the rolling up operation** - Manitou engines are switched off after the start of the operation. CRAB uses 2 hydraulic engines - the turf roll is actually pushing the Manitou, rolls are very tight, infill structure stays the same.

4) **as the roll gets bigger during roll-up, the contact area increases and the NGP therefore diminishes**

Here is the calculation:

one wheel/tire has 24,5 kN (10 000 kg = 98,1 kN), Nominal Ground Pressure (NGP) = $24,5 / (0,46 \times 0,626 \text{ as tire width and length}) = 85 \text{ kPa} = 850 \text{ g/cm}^2$

Some comparisons regarding NGP (Wikipedia):

Wheeled ATV: 13.8 kPa

Human male (1.8-meter-tall, medium build): 55 kPa

Adult horse (550 kg): 170 kPa

Passenger car: 205 kPa

Mountain bicycle: 245 kPa

Road racing bicycle: 620 kPa

3. Arena Master



Separates the infill mixture (sand and rubber) from the artificial turf and stores the infill mixture in big bags. Uses CRAB for rolling up cleaned artificial turf.

What is the speed of the process?

The operator will adjust the speed depending on the condition of the infill mixture in the artificial turf rolls (water, quantity, type etc). On average a 500 m² infill mixture per hour is separated (approx. 10 000 kg infill mixture per hour).

Type of fuel used?

Truck engine, no separate engine

Existing certificates?

CE marking

How is it transported?

On a trailer of a truck

Other remarks?

A 300 m² area needed for operation

4. Wizard I



For drying, cleaning, sieving and separating the infill mixture to clean sand and rubber fractions stored in separate big bags. Separates also dust, old artificial turf fibres and other waste particles.

How much is processed in 1 hour?

3000 kg of infill mixture

Are sand and rubber infills reusable?

Sand and rubber are dried, cleaned and sieved, ready for reusing. By using our technology, processing of the infill makes no alteration in the quality of the infills (sand, rubber).

Rubber infill could also be used as one component for building an e-layer in-situ shock pad.

Type of fuel used?

Diesel

How is it transported?

On truck

Other remarks?

Depending on the order specification, 3 different sieves are selected for operation, a 200 m² area is needed for operation.

5. Wizard II

For drying, cleaning, sieving and separating the infill mixture to clean sand and rubber fractions stored in separate big bags. Separates also dust, old artificial turf fibres and other waste particles.

How much is processed in 1 hour?

8000 kg of infill mixture

Are sand and rubber infills reusable?

Sand and rubber are dried, cleaned and sieved, ready for reusing. By using our technology, processing of the infill makes no alteration in the quality of the infills (sand, rubber). Rubber infill could also be used as one component for building an e-layer in-situ shock pad.

Type of fuel used?

Diesel

How is it transported?

On truck

Other remarks?

Depending on the order specification, 3 different sieves are selected for operation, a 200 m² area is needed for operation.

6. CRAB for reinstallation of used artificial turf



The artificial turf can be reinstalled with infill materials inside without the loss in quality if previously properly rolled up with CRAB (4 m wide rolls / approx. 26-28 per one full-size field). Used artificial turf is usually reinstalled as a second-grade training field, or for school or public use. There is a minimal loss of material in the reinstallation process and a possibility to use a new lining material.

What is the speed of the reinstallation?

5 days for full-size field, gluing and new lining included.

Type of fuel used?

Diesel

Existing certificates?

CE marking

How is it transported?

On truck

Other remarks?

See "CRAB for removal" above

7. Arena Concept recycling factory

Cleaned artificial turf without infill materials that is unsuitable for reusing is recycled at the recycling factory.

What is recycled?

Artificial turf fiber (PE), fiber backing (PP) and latex/PU.

What happens to sand and rubber infill?

Sand and rubber are reclaimed from worn-out artificial turf before recycling and are reused in other applications (cleaning, drying, reinstallation).

What is left over after the recycling?

Dust and other waste particles are taken out during the recycling process.

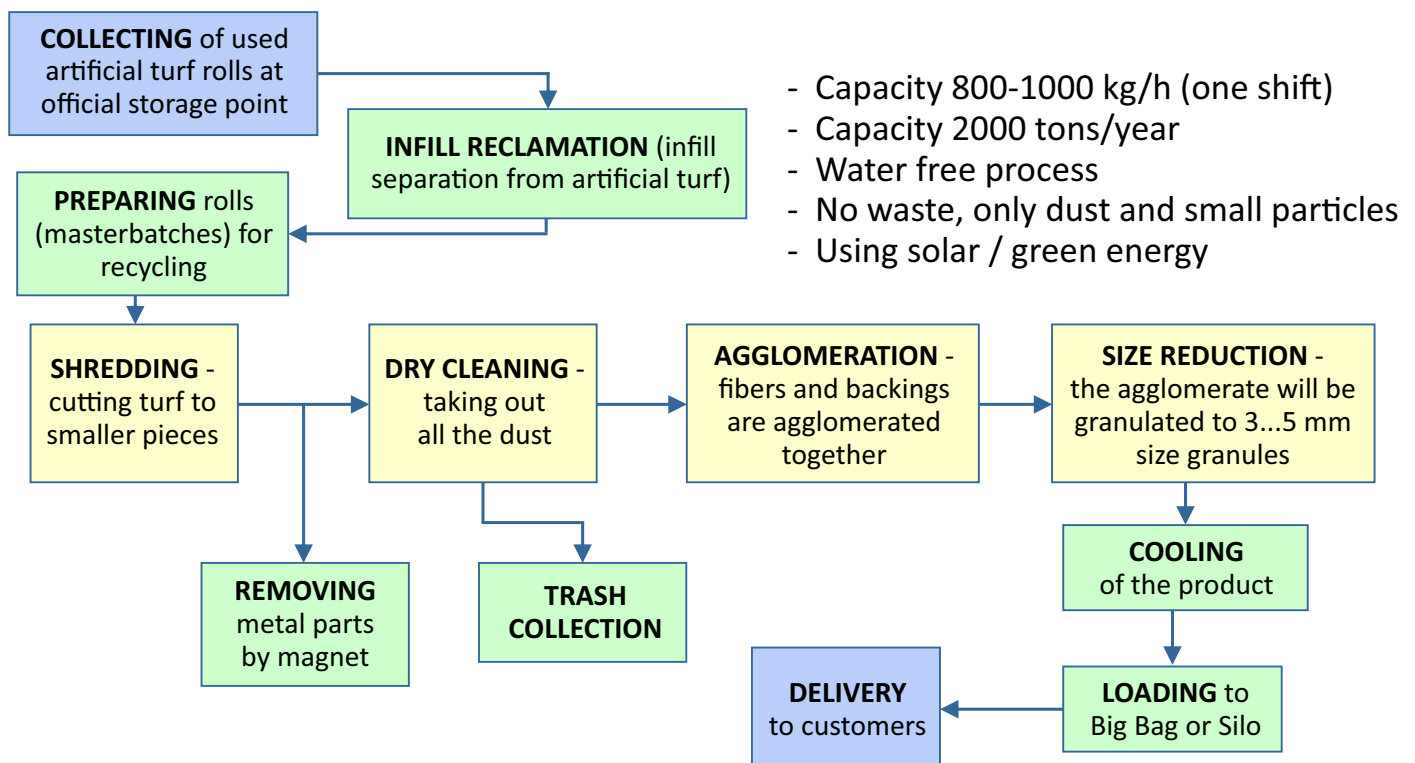
When and where?

Recycling factory starts to work from the summer of 2018 in Estonia.

Permission needed?

Yes, recycling permission issued by National competent authority.

Flowchart of Artificial Turf Recycling



8. Arena Concept mobile recycling factory

Mobile recycling factories (units) are developed as a next step after opening the recycling factory in Estonia. From a strategical and logistical point of view worn out artificial turf fields are collected at purification centres close to cities and Arena Concept mobile units will be moving around and recycling pre-collected fields on-site by the schedule. Agglomerate as a final product will be sold to a local plastic industry.

What is recycled?

Artificial turf fiber (PE), fiber backing (PP) and latex/PU.

What happens to sand and rubber infill?

Sand and rubber are reclaimed from worn-out artificial turf before recycling and are reused in other applications (cleaning, drying, reinstallation).

What is left over after the recycling?

Dust and other waste particles are taken out during the recycling process.

When and where?

EU, bigger cities or areas

Permission needed?

Yes, recycling permission will be applied for all purification centres and operations in time

9. Wizard II – Mill

Crushing/grinding the e-layer in-situ shock pad on-site.

How much is processed in 1 hour?

8000 kg materials

Are materials reusable?

Yes, possible to reuse as materials for new e-layer in-situ

Type of fuel used?

Diesel

How is it transported?

On truck

Other remarks?

A 200 m² area is needed for operation



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