



WORLD RUGBY *Putting players first*

Artificial Rugby Turf Performance Specification - Non-Technical

World Rugby's *One Turf* programme was launched in December 2010 to redefine the use of artificial turf as a playing surface for Rugby and boost global Rugby participation.

For the first time a structure has been implemented to regulate and standardise the development, performance and maintenance of artificial turf worldwide through the appointment of Preferred Turf Producers and Accredited Test Institutes.

The *One Turf* programme is designed to ensure that the best possible performance standards and consistency is achieved while promoting the highest player welfare standards. It has been launched following an extensive collaborative research, testing and review process involving FIFA and the RFU.

This document has been produced to provide a non-technical overview of the programme, which is detailed in World Rugby Regulation 22 (standard relating to the use of artificial Rugby turf), from concept to installation, maintenance and beyond as well as highlighting the clear long-term benefits of artificial turf installation.

The following is an outline of the process to have a Regulation 22 compliant artificial surface installed:

Step 1

Unions, clubs or organisations seeking to install or use an artificial turf playing surface should follow the World Rugby Regulation 22 requirements

Step 2

Manufacturer/World Rugby Preferred Turf Producer submits a product to a World Rugby Accredited Test Institute

Step 3

Product is tested. If it passes then it goes to Step 4

Step 4

A pitch is installed with the laboratory approved system

Step 5

The installed pitch undergoes field testing

Step 6

If the pitch meets all the requirements then it is granted the Approved Status by the national Member Union



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The colour of the artificial turf must be green. Lines should be in a contrasting colour e.g. white or yellow.

The Surface

The artificial turf system comprises three main layers. Underneath the artificial turf sits a shock absorbing layer (optional) and the sub-base which is the foundation.

The testing of a system will occur both within a World Rugby Accredited Test Institute (type testing) and upon the completed installation by a World Rugby Accredited Test Institute. A system will undergo a series of tests to establish its suitability for installation. Only a system that has completed and passed both the laboratory and field testing process will have met the requirements of this specification and is therefore ready for use in Rugby.

Testing Protocol

Laboratory Tests

The laboratory testing will identify the quality of the turf product, ensure sustainability and environmental resistance and demonstrate the required player performance characteristics necessary for Rugby.

Field Tests

The performance of the artificial turf also depends upon the preparation of the sub-base together with quality of the installation of the artificial turf system. Therefore the installed turf will also undergo field testing. Please be aware that field testing must be conducted within three months after installation of the pitch where practicable.

Note: Taking into consideration that the artificial weathering test takes several weeks, and that the field tests can only be performed after the installed pitch has settled, the final approval of a newly developed system may take up to six months.

Test Procedures

There are three basic categories that define the overall performance of an artificial surface suitable for the game of Rugby. These may be broadly defined as:

1. Ball/Surface interaction – the reaction of a ball to the surface
2. Player/Surface interaction - the reaction of a player to the surface
3. Durability – the resistance of the surface to wear and tear, and the environment

The series of tests are as follows:

Laboratory Tests

1. Identification tests – to characterise the surface being tested
2. Durability – to ensure the surface offers performance similar to natural turf and deemed appropriate for Rugby
3. Climatic Resistance – the ability of the surface to withstand the effects of weathering
4. Player/Surface Interaction – the ability of the surface to withstand the effects of play
5. Ball/Surface Interaction

Field Tests

1. Construction tests
2. Player/Surface Interaction
3. Ball/Surface Interaction
4. Identification tests

1. Identification Tests (applies to Laboratory and Field Tests)

The purpose of the identification tests is to ensure that the system installed matches the product tested in the laboratory.

2. Durability

Abrasion Resistance

The surface is artificially abraded (equivalent to five years of typical wear).

Following the above conditioning the systems are re-tested for the following to ensure they still comply with the performance requirements:

- shock absorption
- vertical deformation
- rotational resistance

Joint Strength

Measures the maximum force recorded to destroy the joints where they are sewn or joined with adhesive.

3. Climatic Resistance

UV /Water /Heat

These procedures measure the resistance of the artificial turf against fading of the surface colour by weathering.

Product Stability

The products used must be able to withstand the normal forces that are involved in Rugby. Therefore it is necessary to impose requirements on the artificial turf to ensure the products will withstand such forces.

Pile Height

The nature of the Game dictates the minimum pile height necessary to prevent player studs penetrating the artificial surface causing damage, but also to promote the highest possible player welfare standards. For this reason there is a pile height requirement of 60mm.

4. Player/Surface Interaction

(a) Shock Absorption

The ability of a surface to absorb the impact of a player running on it is called its **Shock Absorption**. A hard surface has the potential to cause injury, while an unusually soft surface can cause player fatigue. It is essential that this aspect of the surface is tested and meets all requirements.

(b) Head Impact Criteria (HIC)

A second method of assessing a surface is to measure the HIC value. Rugby is a sport with a variety of surface impacts and it is important that the surface is tested in order to withstand these forces over a sustained period of time. The HIC for a pitch installed before the March 2011 Performance Specification is 1.0m and for every pitch tendered and installed after this date the HIC must be 1.3m.

(c) Vertical Deformation/Surface Stability

A surface that deforms excessively gives the impression of being unstable and consequentially the player will shorten their stride and reduce speed. The stability of a surface is measured by the amount of give in that surface, also known as **Vertical Deformation**. A large deformation of the surface would indicate a soft yielding surface, no or little deformation a compacted, hard surface.

(d) Slip Resistance

If a player runs on a surface they need to have sufficient foot holding in order to accelerate and decelerate safely. The methods used to assess this characteristic are referred to as Stud Slide Value (SSV) and Stud Deceleration Value (SDV).

(e) Rotational Resistance

Rugby involves repeated changes of direction as the players move around the field. Therefore the surface must allow the player sufficient resistance to ensure stability on the surface. If there is too much resistance the body will be placed under too much stress. This property of the surface is measured using **Rotational Resistance**.

(f) Skin Friction

The average Rugby player can spend considerable time during a match making contact with the playing surface with unprotected skin. It is therefore necessary to assess the interaction of the surface with skin to avoid what is known as Friction Burn.

(g) Energy Restitution

Energy Restitution is the measurement of how much energy is returned to the player through the surface. This is also measured in the same way as Vertical Deformation and Shock Absorbency.

5. Ball/Surface Interaction

It is necessary to measure the height to which a ball bounces when dropped from a specified height on to the surface to ensure that players have control over the ball when it drops. This test method is called Vertical Ball Rebound.

Field Tests

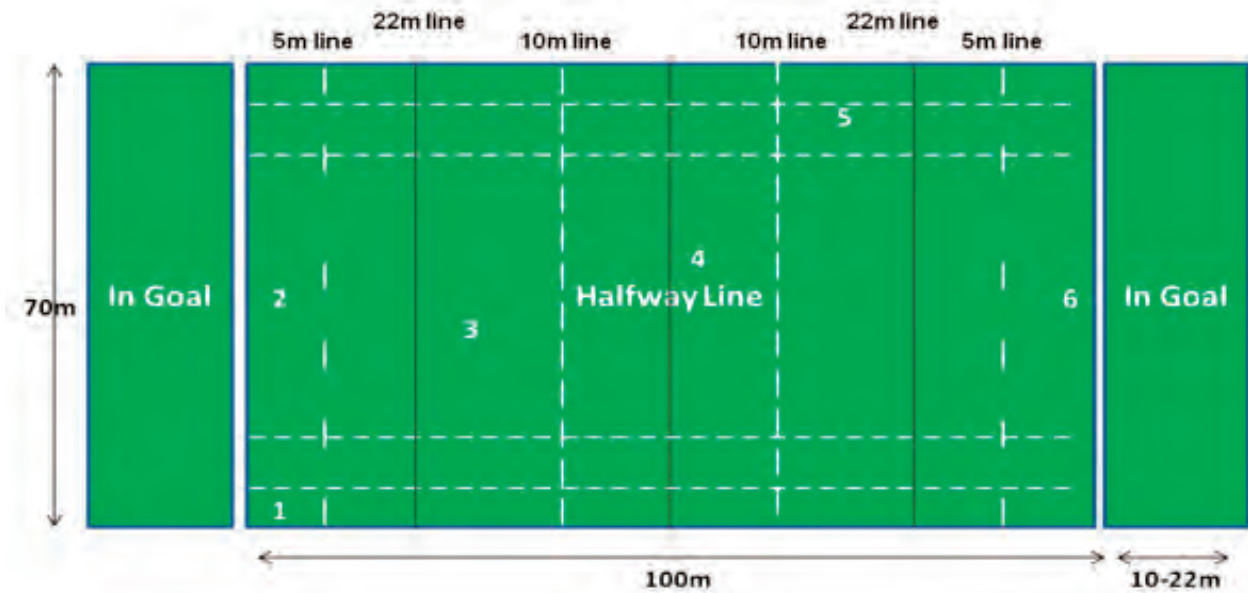
1. Construction Requirements

It is necessary for Rugby to impose certain constructional requirements for an artificial turf installation.

The surface should have a degree of evenness to allow the players to run over the surface without affecting their stride on the surface. The sub-base needs to be permeable to allow the water to freely drain through the system into the drains.

Note: **The 19 locations apply to the AAA testing.**
 The 6 circled locations apply to other field tests.

The Field of Play with Test Areas



DEFINITIONS

Abrade	The process of rubbing away from friction
Ball mill	The apparatus that grinds material into a finer substance
dTex	The weight in grams of 10000m of yarn
Granulometry	The measurement of the size distribution of numerous grains either of performance or stabilising in-fill or sub-base materials.
Performance granules	The rubber/elastomeric/organic granules that form the in-fill
Sub-base	The supporting layer(s) below the synthetic turf system