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FIFA Quality Programme for Football Turf

Handbook of Requirements

October 2015 Edition



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1 Introduction

The development of artificial grass surfaces (designated 'Football Turf' by FIFA) that replicate the playing qualities of good quality natural grass has led to the rapid acceptance of the surfaces by the football world. Manufacturers are producing surfaces that provide a credible alternative solution to parts of the world where climate or resources make the provision of good quality natural grass pitches difficult or impossible. Likewise the development of Football Turfs has provided a potential solution to facility operators wishing to maximise the use of their facilities through community use and those struggling with stadium microclimates that make the maintenance and growth of natural grass difficult.

To ensure these new forms of playing surface replicate the playing qualities of good quality natural grass; provide a playing environment that will not increase the risk of injury to players; are of adequate durability (providing they are adequately maintained) FIFA developed the FIFA Quality Programme for Football Turf. Launched in 2001 the Quality Programme is a rigorous test programme for Football Turf that assesses the ball-surface interaction, player-surface interaction and durability of products and allows successful manufacturers to enter into a licensing programme for the use of the prestigious FIFA QUALITY (formerly FIFA RECOMMENDED) marks.

Football Turf was allowed for official competitive matches in July 2004. The International Football Association Board included the option of using artificial turf surfaces meeting the FIFA Quality Programme for Football Turf in the Laws of the Game. To service the need of professional clubs further, FIFA introduced a second category geared specifically towards the demands of the professional game (FIFA QUALITY PRO, formerly FIFA TWO STAR). The broader category (FIFA QUALITY, former FIFA ONE STAR) has wider bands of acceptability as it is geared towards durability and safety for more intense use at community level. Both categories are entitled to host international matches subject to the relevant competition rules.

The laboratory test programme that a Football Turf must satisfy as part of the FIFA Quality Programme includes a programme of simulated use to assess the ability of a surface to perform for a period of time. The degree of simulated use undertaken on FIFA QUALITY PRO compliant products is designed to replicate low to moderate levels of use often found on football specific stadium fields; whilst the degree of simulated use undertaken on FIFA QUALITY compliant products is designed to replicate the higher levels of use found on training and community fields. Potential installers of Football Turf fields should note, however, that experience has shown fields subjected to very high intensity use may not be able to retain the demanding performance criteria of the FIFA Quality Programme for the life of the playing surface. Failure to undertake adequate maintenance will also reduce the period of time a field may satisfy the requirements of the FIFA Quality Programme.

This edition of the manual supersedes previous editions with effect from 26 October 2015. The changes incorporated into this edition of the manual are:

General changes

- Change of the designation of the certification types: the FIFA QUALITY PRO mark supersedes the FIFA 2 STAR category and the FIFA QUALITY mark replaces the FIFA 1 STAR category. On top of rebranding, both categories have seen some user-specific requirements added to the particular level.

- The following new test methods have been included for all FIFA QUALITY and FIFA QUALITY PRO fields:
 - Method for the determination of heat on artificial turf products
 - Advanced wear simulation device: Lisport XL
 - Method for calculating reduced ball roll on samples tested in the Lisport XL
 - Method for the measurement of free pile height
 - Method for the measurement of infill depth
 - Method for the determination of UV stabiliser content in yarns
 - Method for clarification of the particle size distribution measurement
 - Method for clarification for the measurement of differential scanning calorimetry (DSC)
 - Method for clarification for the measurement of yarn decitex
 - Method for clarification of product identification on woven carpet products
 - Method for clarification of porosity testing on artificial turf systems
 - Method for clarification of yarn thickness measurement
- The following tests have been removed from the handbook of test methods:
 - Stud slide and stud deceleration removed from laboratory testing
 - Wear simulation with lisport removed from laboratory testing
- All products used for field markings (lines and logos where applicable) need to be tested as independent products.
- Only one specific product may be used per field. No combination of different products (different colours, yarn compositions or other) may be used on one single field.
- Tighter requirements for product test in the laboratory
- Recommendations for the testing of run-off areas (both with natural and artificial playing surfaces) have been included in this handbook

Category-specific changes

FIFA QUALITY PRO level

- A new method to assess infill splash has been introduced for this level of the game
- Requirement relating to the quality of lines, goals and all relevant playing equipment have been included in the test institute assessment
- Performance tests in the laboratory after 3000 cycles on the lisport XL including reduced ball roll
- Ball roll requirements for re-tests reduced from 10m to 8m

FIFA QUALITY level

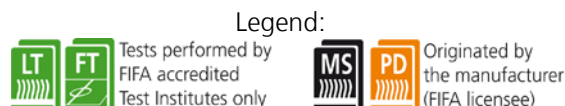
- Performance tests in the laboratory after 6000 cycles on the lisport XL including reduced ball roll

2 Field certification

The FIFA Quality Programme is the certification of a particular field that has been found to fully meet the requirements of the Quality Programme. It is not the approval of products. In order to be certified, football turf fields must reach the performance and quality criteria established to provide the best possible playing conditions. To this end, each field must undergo four steps as outlined below:



Fig. 1.2 Approval process steps and the related documents / parties



The phases of testing are described below.

2.1 Step 1: a thorough test of the product in the laboratory

- The manufacturer (as existing or potential licensee) submits the appropriate samples to a FIFA accredited laboratory test institute. A list of accredited test institutes is available on www.fifa.com/quality.
- The FIFA accredited laboratory will undertake all the statutory tests laid out in the FIFA Quality Programme – Handbook of Requirements. If the sample submitted has fulfilled all the requirements a Test Report is submitted to FIFA confirming that the manufacturer's product has met the requirements of the FQP Laboratory Test Procedure. Note: this document is not a product certificate.
- The licensee will be informed that the product is available for installation and eligible for the next steps of testing (subject to completion of the license contract between FIFA and the manufacturer).

2.2 Step 2: the installation of the product as declared, applying the outlined procedures

- The product must be installed with similar composition of materials within the required tolerances as was tested in the laboratory in the previous step.
- Further documentation (method statement and product declaration) shall be filled out by the licensee to document the installation procedure.

2.3 Step 3: initial field assessment

2.3.1 Test procedure and technical assessment of the playing surface

- Following the installation of the field, the Licensee must request the field test by means of the FIFA online database (access is granted to each licensee upon signature of the agreement).
 - The licensee shall appoint one of the FIFA accredited field test institutes (list available on www.fifa.com/quality).
 - The test request must contain the details of the product as well as the method statement and product declaration. In addition the licensee shall indicate which FIFA accredited test institute it has appointed for the test of the field.
 - FIFA approves the complete request and allocates a test number to the field
- The field shall be fully tested in accordance with the procedures specified in Table 3.
- Samples of the artificial grass and any infill used to construct the field shall be taken from site by the Test Laboratory and tested using the procedures detailed Table 4 to ensure they are of the same specification as those submitted for the initial laboratory type approval (subject to the tolerances specified in Table 4).
- The results of the field and quality control tests will be entered onto a FIFA Field Test Report by the Test Laboratory which shall be sent to FIFA (via the online database) for review.

Note – if the field fails the initial field test the test institute is still required to prepare and submit a FIFA Field Test Report informing FIFA of the failure. If a second initial test is required a new Field Test Report Number should be requested from FIFA.

2.3.2 Important additional notes regarding testing and eligibility for use of the field

- The Laws of the Game allow international matches to be played on fields with several sets of lines. The IFAB ruling on Law 1 states: “Where artificial surfaces are used, other lines are permitted provided that they are of a different colour and clearly distinguishable from the lines used for football.” Tournament organisers may however have stricter rules on the use of additional linage.
- The test institute shall take note of any additional markings (logos, writing, adverts) other than those specified in the Laws of the Game.
 - As the professional standard, FIFA QUALITY PRO installations must meet the requirements for international match dimensions as indicated in Law 1 and may not bear additional marking (such as logos) other than those accounted for in the Laws of the Game. In addition, field equipment (goals and corner flags) shall be in the correct position and of the correct dimensions.
 - FIFA QUALITY installations may lose their eligibility to host competitive matches in accordance with the Laws of the Game by the presence of marks

(logos etc.) on the field. The certificate is awarded to confirm the technical compliance with the requirements only.

- The test institute shall verify that the end user received both the product declaration and method statement in accordance with the FIFA licensee agreement.
- The test institute shall verify that adequate maintenance equipment is on site or an appropriate maintenance contract (evidence needed) is in place.

2.4 Step 4: Field certification

If the field satisfies all the aspects of the above steps within the FIFA Quality Programme, FIFA will grant the appropriate certification to the installation.

2.4.1 Eligibility for (international competitions)

FIFA QUALITY PRO fields are designed to meet the criteria for international competitions. FIFA QUALITY fields may have varying dimensions or markings. In order for competitive matches to be carried out, the compliance with the Laws of the Game as well as national or local regulations must be ensured. While the FIFA Quality Programme certificate is essential to this eligibility, the compatibility of pitch markings and dimensions need to be verified.

2.4.2 Period of field certification

FIFA QUALITY PRO field certification is valid for 12 months and FIFA QUALITY certification is valid for three years unless:

- the field is subsequently found to no longer satisfy all the aspects of the FIFA Quality Programme following a scheduled or random spot check field test
- or
- the Football Turf is removed or replaced.

2.5 Field retesting

- A retest can be requested on any field that has previously been tested and not been modified. Where a pitch has been resurfaced, an initial test shall be performed.
- A field shall be re-tested according to the standard that it was first tested to but can, on request, be tested to the newest standard
- Retesting of a field may be requested by the licensee or the field owner/operator or a FIFA accredited test institute for Football Turf that was contacted by a field's stakeholder or a national association/confederation or FIFA. The licensee shall request the field test through the online database. All other requestors shall do so by email to the FIFA Quality Programme (quality@fifa.org).
- Testing shall be undertaken by a FIFA accredited Field Test Institute in accordance with the above-noted procedure and in full accordance with the procedures specified in Table 3.
- Retesting may be undertaken up to three months in advance of a field's renewal date without the subsequent renewal date changing. Fields may only be tested more than

three months before the expiration of the certification in exceptional cases such as requirements by national competition rules to test at more frequent intervals.

- The results of the field and quality control tests will be entered onto a FIFA Field Test Report by the Test Laboratory which shall be sent to FIFA (via the online database) for review.

2.5.1 Certification following re-tests

- If a field is found to fully comply with Tables 3 and 5 as well as the Laws of the Game in regard to line marking and marks on the field, as detailed below, it is recertified for a further 12 months.
- If a field fails to satisfy the FIFA QUALITY PRO category, it loses its FIFA certification. A re-certification as FIFA QUALITY is not possible. Certification as FIFA QUALITY must be obtained by carrying out a new initial test in accordance with step 1.
- If a field fails to satisfy the FIFA QUALITY category, it loses its FIFA certification.
- There is no limit to the number of re-tests on any given field provided the procedure in 2.5 is adhered to.

3 Test methods

The test methods used to assess Football Turfs and installed fields are described in either the FIFA Handbook of Test Methods for Football Turf 2015 edition (identified by the prefix FIFA), International Standards (identified ISO) or European Standards (identified EN). Where a test method is given a dated reference, subsequent amendments to or revisions of the method will apply to this Handbook of Requirements only when incorporated into it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

Note: Fields submitted for initial testing in accordance with the 2015 handbook may only be surfaces with Football Turf that meets the 2015 edition of the FIFA Handbook of Requirements for Football Turf.

4 Laboratory test requirements

4.1 General

When tested in the laboratory for initial type approval the Football Turf shall fully satisfy the requirements of Table 1 using the methods of test specified.

The entire set of laboratory tests must be carried out for all different products used to make the football pitch: this explicitly includes, the Football Turf system, the Football Turf system used for the lines and, where applicable, any other systems used for representations on the field (for example for logos, each coloured yarn shall be tested as an individual system).

The components of the Football Turf shall be identified using the test methods specified in Table 2 and the results compared to the data supplied by the licensees (Section 3 of the FQP Laboratory Report Form). The differences between the product identification tests and licensee's data shall be within the tolerances specified in Table 2.

4.2 Resistance to artificial weathering

If a Football Turf pile is manufactured from a pile yarn that has been previously tested by a FIFA Test Laboratory for Resistance to Artificial Weathering the results may be used for the new Football Turf providing that:

- a pile yarn characterisation (DSC) shows the yarn to be within normal manufacturing tolerances of that previously tested;
- the declared pile thickness is no less than 90% of the declared value. For clarification: for a group of otherwise identical yarns with different thicknesses, only the thinnest must be tested;
- the profile of the yarn is the same as the yarn tested previously;
- the colour (RAL Classic) of the yarn is within normal manufacturing tolerances of the yarn tested previously;

4.3 Use of existing shockpads / elastic layers

If an existing artificial turf pitch is to be converted to Football Turf or an existing Football Turf surface is to be replaced, any existing shockpad or elastic layer may be incorporated into the new surfacing system provided:

- the shock absorption of the existing shockpad is between 90% and 110% of the shock absorption value declared by the manufacturer when the Football Turf system was initially type approved;
- the deformation of the existing shockpad is ± 2 mm of the deformation declared by the manufacturer when the Football Turf system was initially type approved;
- the water permeability of the shockpad is greater than 180mm/h when tested in accordance with EN 12616.

The installed shockpad shall be tested for each property detailed above in the positions detailed in the FIFA Handbook of Tests Methods for Football Turf (section 4) by a FIFA Field Institute. Despite practical implications when a turf has not yet been replaced, it is not acceptable to determine the suitability based on the values obtained from testing the corner areas only. Tests shall be made no sooner than 12 months before the initial field test after resurfacing. The results of the shockpad tests shall be appended to the FIFA Field Test Report and issued to FIFA following the initial field test.

Compliance with the above requirements does not override the need for the field to fully satisfy the field test requirements of the FIFA Quality Programme.

4.4 Calculation of Variations

Unless explicitly stated, variations are to be calculated as percentage of the declared value and not of the site sample.

4.5 Order of testing

To ensure consistency of test results, all test institutes should carry out the procedures in the same order. The five samples should therefore be used as listed below. Where laboratory conditions allow, the tests performed in dry conditions may be carried out on samples 2a or 2b instead of 1 or 3:

Sample 1 NEW	Sample 2a LISPORT XL 3000	Sample 2b LISPORT XL 6000	Sample 3 NEW
Size: 1 x 1 m	Size: 4 x 1 m	Size: 4 x 1 m	Size: 1 x 1 m
Preparation of sample	Preparation of sample	Preparation of sample	Preparation of sample
Conditioning	FIFA 17 Reduced Ball roll Dry FIFA 18 – free pile height & FIFA 21 infill depth	FIFA 17 Reduced Ball roll Dry	FIFA 08 Surface Friction & Abrasion
FIFA 02 Angle ball rebound - dry	FIFA 15 Mechanical Abrasion	FIFA 15 Mechanical Abrasion	Re-conditioning
Re-conditioning	FIFA 17 Reduced Ball roll Dry	FIFA 17 Reduced Ball roll Dry	FIFA 16 Infill Splash
Wetting	Redistribute infill by hand	Redistribute infill by hand	
FIFA 01 Ball rebound wet	FIFA 01 Ball rebound Dry	FIFA 01 Ball rebound Dry	
Redistribute infill by hand	Redistribute infill by hand	Redistribute infill by hand	
FIFA 04a Shock absorption Wet FIFA 05a Vertical deformation wet FIFA 13 Energy Restitution wet	FIFA 04a Shock absorption – Dry FIFA 05a Vertical deformation - Dry FIFA 13 Energy Restitution	FIFA 04a Shock absorption – Dry FIFA 05a Vertical deformation - Dry FIFA 13 Energy Restitution	
Redistribute infill by hand	Redistribute infill by hand	Redistribute infill by hand	
FIFA 06 Rotational resistance wet	FIFA 06 Rotational resistance - Dry	FIFA 06 Rotational resistance - Dry	Sample 4 & 5 NEW
	Re-conditioning	Re-conditioning	Size: 0.4x0.4 m (2x)
	FIFA 08 Surface Friction & Abrasion	FIFA 08 Surface Friction & Abrasion	FIFA 04a -5°C & +50°C tests
	Re-conditioning	Re-conditioning	
	Wetting	Wetting	End of tests
	FIFA 17 Reduced Ball roll Wet	FIFA 17 Reduced Ball roll Wet	
Redistribute infill by hand			
FIFA 02 Angle ball rebound wet			Sample 6 NEW
			Size: 0.4x0.4 m
End of tests			FIFA 14 Heat Test
			End of tests

Table 1 – Laboratory test requirements

Property	Test Method	Test conditions			Requirements	
		Preparation	Temperature	Condition	FIFA QUALITY PRO	FIFA QUALITY
Vertical ball rebound	FIFA 01 & FIFA /15	Pre-conditioning	23°C	Dry	0.60m - 0.85m	0.60m – 1.0m
				Wet		
		Simulated Wear – 3000 cycles		Dry	0.60m - 0.85m	N/A
		Simulated Wear – 6000cycles		Dry	N/A	0.60m – 1.0m
Angle ball rebound	FIFA 02	Pre-conditioning	23°C	Dry	45% - 60%	45% -70%
				Wet	45% - 80% ¹	
Reduced Ball roll	FIFA 17 & FIFA 15	Pre-conditioning	23°C	Dry	4 – 8 m	4 – 10 m
		Simulated Wear – 3000 cycles		Dry	4 – 8 m	N/A
				Wet	4 – 8 m	N/A
		Simulated Wear – 6000 cycles		Dry	N/A	4 – 12 m
				Wet	N/A	4 – 12 m
Shock Absorption	FIFA 04a & FIFA 15	Pre-conditioning	23°C	Dry	62% - 68%	57% - 68%
				Wet		
		Simulated Wear – 3000 cycles		Dry	62% - 68%	N/A
		Simulated Wear – 6000 cycles		Dry	N/A	57% - 68%
	FIFA 04a 1 st impact	Pre-conditioning	50°C	Dry	62% - 68%	57% - 68%
		-	-5°C	Frozen	62% - 68%	57% - 68%

¹ There shall be no more than a relative 40% increase between the value of the dry test and the wet test.

Property	Test Method	Test conditions			Requirements	
		Preparation	Temperature	Condition	FIFA QUALITY PRO	FIFA QUALITY
Vertical Deformation	FIFA Test Method 05a & FIFA Test Method 15	Pre-conditioning	23°C	Dry	4mm – 10mm	4mm – 11mm
		Pre-conditioning		Wet		
		Simulated Wear – 3000 cycles		Dry	4mm – 10mm	N/A
		Simulated Wear – 6000 cycles		Dry	N/A	4mm – 11mm
		Pre-conditioning	50°C	Dry	4mm – 10mm	4mm – 11mm
	FIFA 05a 1 st impact		-5°C	Frozen	4mm – 10mm	4mm – 11mm
Rotational Resistance	FIFA Test Method 06 & FIFA Test Method 15	Pre-conditioning	23°C	Dry	32Nm - 43Nm	27Nm - 48Nm
				Wet		
		Simulated Wear – 3000 cycles		Dry	32Nm - 43Nm	N/A
		Simulated Wear – 6000 cycles		Dry	N/A	27Nm – 48Nm

Property	Test Method	Test conditions			Requirement	
		Preparation	Temperature	Condition	FIFA QUALITY PRO	FIFA QUALITY
Skin / surface friction	FIFA Test Method 08	Pre-conditioning	23°C	Dry	0.35 - 0.75	0.35 - 0.75
Skin / surface friction	FIFA Test Method 08	Simulated Wear – 3000 cycles	23°C	Dry	0.35 – 0.75	
Skin / surface friction	FIFA Test Method 08	Simulated Wear – 6000 cycles	23°C	Dry		0.35 - 0.75
Skin abrasion	FIFA Test Method 08	Pre-conditioning	23°C	Dry	± 30%	± 30%
Skin Abrasion	FIFA Test Method 08	Simulated Wear – 3000 cycles	23°C	Dry	0.35 - 0.75	

Skin Abrasion	FIFA Test Method 08	Simulated Wear – 6000 cycles	23°C	Dry		0.35 – 0.75
Heat determination	FIFA Test Method 14	Pre-conditioning	N/A	Dry	For information	Optional information
Infill splash	FIFA Test Method 16	Pre-conditioning	23°C	Dry	Note <1.5% or ≥1.5%	N/A

Artificial Weathering (FIFA 10)				
Component	Property & test method		Requirement	
			FIFA QUALITY PRO	FIFA QUALITY
Artificial turf	Colour change	EN ISO 20105-A02	≥ Grey scale 3	
Pile yarn (s)	Tensile strength	EN 13864	Percentage change from unaged to be no more than 50%	
Polymeric infill	Colour change	EN ISO 20105-A02	≥ Grey scale 3, no change in shape	
Joint strength: stitched seams	Joint strength – unaged	EN 12228 Method 1	1000N/100mm	
	Joint strength - after immersion in hot water	EN 13744 & EN 12228 Method 1		
Joint strength: Bonded seams	Joint strength – unaged	EN 12228 Method 2	75N/100mm	
	Joint strength - after immersion in hot water	EN 13744 & EN 12228 Method 2		

Property	Test Method	Condition	Requirement	
			FIFA QUALITY PRO	FIFA QUALITY
Tuft withdrawal	ISO 4919	Unaged	≥30N	≥30N
	EN 13744 & ISO 4919	After immersion in hot water	≥30N	≥30N

Tensile strength of shockpads and e-layers (if supplied as part of system)	EN 12230	Unaged	≥0.15MPa	≥0.15MPa
Water permeability ¹ - using a single ring infiltrometer in which the artificial turf carpet is sealed prior to infilling and testing	FIFA Test Method 24	Unaged	≥ 180mm/h ⁽²⁾	≥ 180mm/h ⁽²⁾

1 Not applicable to surfaces designed specifically for indoor use

2 To ensure adequate drainage of a field all individual elements of the football turf should satisfy this requirement. Any value above 2000mm/h shall be recorded as ">2000mm/h"

Table 2 – Product identification tests

Component	Characteristic	Test method	Permitted variation between laboratory component and manufacture's declaration
Artificial turf	Total mass per unit area	ISO 8543	$\leq \pm 10\%$
	Tufts per unit area	ISO 1763	$\leq \pm 10\%$
	Knots per unit area (woven carpets) ²		
	Tuft withdrawal force ³	ISO 4919	$\geq 90\%$ of manufacturer's declaration
	Pile length above backing	ISO 2549	$\leq \pm 5\%$
	Free pile height	FIFA Test Method 18	-
	Thickness of yarn	FIFA Test Method 25	$\geq 90\%$
	Total pile weight Pile weight above backing (woven carpets) ⁴	ISO 8543	$\leq \pm 10\%$
Pile yarn(s)	Water permeability	FIFA Test Method 24	$\geq 180\text{mm/h}^5$
	Pile yarn characterisation	FIFA Test Method 22	Same polymer
	Pile Dtex	FIFA Test Method 23	$\leq \pm 10\%$
Performance infill (if supplied as part of system)	Particle size	FIFA Test Method 20	Maximum 1 sieve difference
	Particle shape	EN 14955	Similar shape
	Bulk density	EN 1097-3	$\leq \pm 15\%$
	Composition	TGA	-
	Infill depth	FIFA 21	-

² A lot of woven carpets are using W bindings. Pay attention to count the complete W as one knot. It can be easier to count the number of knots by splitting warp and weft yarns or shearing off the pile yarns

³ If all piles are breaking, then the tuft withdrawal force is bigger than this breaking force. Report the mean of the broken results

⁴ Try to split warp and weft of the carpet. If the coating that is applied makes this impossible, shear off the piles following the procedure in ISO 8543. This is the pile weight above the backing

⁵ Not applicable to surfaces designed specifically for indoor use

Component	Characteristic	Test method	Permitted variation between laboratory component and manufacture's declaration
Stabilising infill (if supplied as part of system)	Particle size	FIFA Test Method 20	Maximum 1 sieve difference
	Particle shape	prEN 14955	Similar shape
	Bulk density	EN 1097-3	$\leq \pm 15\%$
Shockpads / e-layers (if supplied as part of system)	Shock Absorption	FIFA Test Method 04a	$\leq \pm 5\%$ absolute Force Reduction
	Thickness	EN 1969	$\geq 90\%$ of manufacturer's declaration
	Tensile strength of shockpads and e-layers	EN 12230	<u>0.15MPa</u>
Unbound sub-bases (if tested as part of system)	Composition	-	Similar composition
	Particle size range (attach particle size grading to test report)	EN 933 - Part 1	$\leq \pm 20\%$
	Particle shape	EN 14955	Similar shape

5 Field Test Requirements

5.1 Field tests procedures

When tested a field (pitch) shall fully satisfy the requirements of Table 3 in any position on the field using the methods of test specified. The field shall be tested in the positions specified in the FIFA Handbook of Test Methods for Football Turf. Field tests should not be made on joints or inlaid lines, other than ball roll that will cross them. Maintenance of the field shall not be undertaken during a field test.

If a field fails to satisfy the requirements of Table 3 the report must be completed and submitted to FIFA indicating what the field failed on. The field may be tested again at a later stage.

Metrological conditions during the field tests shall be as specified in the FIFA Handbook of Test Methods for Football Turf.

5.2 Visual inspection

During the field test programme the Field Test Institute shall make a visual inspection of the field to ensure there are no significant defects they consider to be hazardous to players. In particular there shall be no:

- failed or excessively open joints (greater than 3mm),
- no looped piles
- excessively uneven distribution of infill: difference in infill height between lowest and highest spot should not exceed 10mm.
- exposed irrigation sprinkler heads within the playing area
- exposed goal post sockets
- hazards within 3 metres of the perimeters of the field of play

Checks will also be made to ensure line markings are straight. Comment on significant deviations.

If unacceptable joints, looped piles, non-straight lines or any other defect considered hazardous to play are found they shall be reported to the Licensee who shall rectify the defects to the satisfaction of the Field Test Institute prior to the Field Test Institute issuing the Field Test Report to FIFA. Add visual evidence of the improvement work to the report.

In addition the Test Institute shall note the following characteristics:

- presence of logos on the field of play or the run-off area (within 3 metres of the field of play or in accordance with the local definition of run-off area)
- Presence of different line markings on the field

Important note: The visual inspection undertaken by the Test Laboratory does not constitute a formal site audit and does not remove the legal responsibility of the installation company and or the facility operator to ensure the field is safe and fit for use. Neither FIFA nor its accredited test laboratories accept any liability for any defects or other issues that subsequently result in an injury to a player or other users.

5.3 Material identification – first field test

In order to ensure the components of Football Turf installed on a field are the same as those previously tested in the laboratory the first field test shall include the identification tests detailed in Table 4. The maximum variation between the installed materials and the

manufacturer's declaration, as detailed on the FIFA Quality Programme Laboratory Report, shall be as specified in Table 4.

The samples of artificial turf and infill shall be collected on site by the laboratory when they undertake the field test. **Where alternative suppliers of infill materials to those detailed in the original laboratory test report are to be used, samples of the infill should also be submitted in advance of construction so that compliance of these materials with the requirements of the FIFA Handbook can be determined prior to installation.** In any case, the name of the supplier shall be noted. Samples should be submitted in adequate time so that if it is found they do not comply with the requirements of the FIFA Handbook a new laboratory test using the new materials can be made prior to installation of the Football Turf and subsequent field testing.

Note: each field may only consist of one product (defined by a system with a fully compliant laboratory test report). In particular the use of two different coloured yarns in alternating rolls (to create visual patterns) are not permitted.

5.4 Material identification – field retests

To check that the Football Turf installed on a field has not been materially altered from that tested previously any retest shall include the identification tests detailed in Table 5 and the Football Turf shall comply with the requirements of Table 5.

5.5 Maintenance equipment

For a field to be certified under the FIFA Quality Programme for Football Turf the facility operator shall ensure that all the equipment specified by the surface manufacturer for the installed Football Turf product is available to maintain the field in accordance with the manufacturer's instructions. This may either be achieved by the facility operator purchasing the equipment or entering a service agreement with a specialist maintenance contractor or a combination of both. In the case of maintenance being outsourced, the manufacturer shall present written evidence of such an agreement to maintain the field.

Maintenance equipment on site must at least include a tractor unit, either a drag brush or drag mat, additional infill to top up the field, the maintenance log and a ball roll ramp. If this is not the case, the test institute shall note this on the field test report and indicate the field as failed.

The facility operator shall ensure all required maintenance equipment is available for inspection by the test institute during the field test.

5.6 Sprinklers

FIFA do not endorse the use of sprinklers within the playing area of a football field. However, FIFA does acknowledge that occasionally sprinkler systems have to be installed within the playing area because, primarily due to a lack of water pressure available to project water from outside of the play area onto the central portion of the field; such systems have been installed in both natural and artificial turf football fields.

One of the primary aims of the *FIFA Quality Programme for Football Turf* is to take into consideration the comfort and safety of players. Therefore where a sprinkler system has been installed within the playing area there will be an additional test requirement to check that the sprinklers do not present an additional hazard to the players. The Field Test Institute will undertake Shock Absorbency and Vertical Deformation evaluation, in accordance with this manual, on two separate sprinklers (either side of the field). The values obtained must be within the requirements for the particular performance level that the field has been constructed to meet. Neither FIFA nor the field test institute shall be liable for any damage occurring to the sprinklers as a result of these tests. In requesting/allowing a FIFA field test the facility operator is deemed to have accepted this condition of test.

It should be clearly stated by the contractor responsible for installing the Football Turf whether or not additional maintenance work is required, to ensure the consistency of the infill, after the sprinkler has been elevated and returned to its lowered position. If an additional maintenance procedure is required the Test Institute shall undertake a further test of Shock Absorbency and Vertical Deformation after the maintenance procedure to ensure the area above the sprinkler meets the requirements. Obviously to achieve this, the sprinkler system must be activated and the maintenance procedure carried out before the tests can take place.

5.7 Maintenance during field tests

Maintenance of the field shall not be undertaken during a field test.

Table 3 – Field Test Requirements

Characteristic	Test Method	Requirement					
		FIFA QUALITY PRO		Consistency ⁶	FIFA QUALITY		Consistency ⁷
Vertical ball rebound	FIFA 01	60cm - 85cm		± 5% relative	60cm - 100cm		±10% relative
Ball roll	FIFA 03	Initial assessment	4m - 8m	±10% relative	Initial assessment	4m – 10m	±15% relative
		Re-tests	4m – 8m	±10% relative	Re-tests	4m – 12m	±15% relative
Shock Absorption	FIFA 04a	60% - 70%		± 5% relative	55% - 70%		±10% relative
Vertical Deformation	FIFA 05a	4mm – 10mm		±10% relative	4mm – 11mm		±15% relative
Rotational Resistance	FIFA 06	30Nm - 45Nm		± 6% relative	25Nm – 50Nm		±10% relative
Surface regularity of playing surface	FIFA 12	<10mm		-	<10mm		-
Free pile height	FIFA 18	For information		-	For information		-
Infill depth	FIFA 21	For information		-	For information		-

Table 4 - Material identification and consistency – first site test

Component	Characteristic	Test method	Permitted variation between manufacture's declaration and installed materials
Artificial turf	Mass per unit area	ISO 8543	≤ ± 10%
	Tufts per unit area	ISO 1763	≤ ± 10%
	Tuft withdrawal force	ISO 4919	≥ 90% of manufacturer's declaration, min. 30N
	Pile length above backing	ISO 2549	≤ ± 5%
	Total pile weight	ISO 8543	≤ ± 10%
	dtex	FIFA Test Method 23	≤ ± 10%

⁶ No result from any defined position may vary from the average of the set of results within the field test.

⁷ No result from any defined position may vary from the average of the set of results within the field test.

	Water permeability of carpet (non infill) ⁸	FIFA Test Method 24	≥180mm/h and greater than 75% of laboratory result ⁹
	UV stabilizer	FIFA Test Method 19	Report for every masterbatch
Pile yarn(s)	Pile yarn characterisation	FIFA Test Method 22	Same polymer
Performance infill (if supplied as part of system)	Particle size	FIFA Test Method 20	60% between d and D
	Particle shape	EN 14955	Similar shape
	Bulk density	EN 1097-3	≤ ± 15%
	Composition	FIFA Test Method 11	≤ ± 15% relative

Component	Characteristic	Test method	Permitted variation between manufacture's declaration and installed materials
Stabilising infill (if supplied as part of system)	Particle size	FIFA Test Method 20	60% between d and D
	Particle shape	prEN 14955	Similar shape
	Bulk density	EN 1097-3	≤ ± 15%
Shockpads / e-layers ¹⁰ (if supplied as part of system)	Shock Absorption	FIFA Test Method 4a	≤ ± 5% Force Reduction
	Thickness	EN 1969	≥ 90% of manufacturer's declaration

⁸ Outdoor pitches only. Compliance with this requirement may also be waived by FIFA for fields located indoors or in arid parts of the world. Such waivers will be granted on a case by case basis and permission should be sought from FIFA at the design stage of a field's construction.

⁹ If the result exceeds 2000mm/h, denote "> 2000mm/h"

¹⁰ When measured in at least four locations

Table 5 - Material identification and consistency – site retests

Component	Characteristic	Requirement	Sampling procedure
Artificial turf ¹¹	Pile height (above primary backing)	≤ ± 5% of the value measured on the site sample tested during the initial site test	Measurements shall be made in four different areas of the field not subjected to high areas of wear or usage. The number of tufts per m ² shall be calculated by multiplying the number of stitches per 100mm by the stitch gauge.
	Number of stitches per 100mm	The number of tufts per m ² shall not differ by more than ± 10% of the manufacturer's declaration	
	Stitch spacing (mm)		
Performance infill ¹²	Particle grading	The largest sieve retaining at least 10% by mass of the infill shall be within the range detailed in the manufacturer's declaration forming Section 4 of the product's FIFA Laboratory Test Report.	A minimum sample of 250g shall be taken from the performance infill (20mm) on each of the six tests positions detailed in the FIFA Handbook of Test Methods for Football Turf. The infill shall be graded in accordance with EN 933 Part 1 and the largest sieve retaining at least 10% by mass of the infill determined.

¹¹ These measurements are made to check the carpet has not been replaced

¹² This test is carried out to ensure that coarser infill material has not been installed on the field

6 Field dimensions and markings

6.1 Field dimensions

Dimensions should be in accordance with the Laws of the Game. The field of play must be rectangular. The length of the touchline must be greater than the length of the goal line. **Special dispensation may be granted for FIFA QUALITY PRO fields that do not meet the requirements subject to a request by one of FIFA's Member Associations.**

	FIFA QUALITY	FIFA QUALITY PRO
Length	Min. 90.0m, max. 120,0m	Min 100.0m, max 110.0m
Width	Min 45.0m, max 90.0m	Min 64.0m, max 75.0m

Run-offs shall be in accordance with national and or competition rules. In the absence of any such rules a minimum of 3m per boundary is recommended. Provision of adequate run-offs does not form part of the FIFA Quality Programme.

Note: International Matches must be played on a field with following dimensions

Length	Min. 100.0m	max 110.0m
Width	Min 64.0m	max 75.0m

6.2 Field Markings

The field shall be field marked in accordance with Law 1 - The Field of Play as detailed in the Laws of the Game. The goal posts must also have the same depth as the width of the line.

Note: If a FIFA certified field is to be used for competition the respective competition regulations must be met and checked by the responsible local authorities.

In accordance with the decisions of the International Football Association Board:

No kind of commercial advertising, whether real or virtual, shall be permitted on the field of play and field equipment from the time the teams enter the field of play until they have left it at half time and from the time the teams re-enter the field of play until the end of the match. In particular no advertising material of any kind may be displayed on goals nets flag-posts or their flags (Decision 3)

The reproduction of, whether real or virtual of representative logos or emblems of FIFA, confederations, member associations leagues clubs or other bodies is forbidden on the field of play and field equipment (including goal nets and areas they enclose) during playing time, as described in Decision 3 (Decision 5).

7 Run-off area

Where artificial turf is used within the run-off area (starting directly on the outer limit of the touchline and goal line), the quality should reflect the high standard of the FIFA Quality Programme for Football Turf as it is an area which players and match officials interact on and with. Due to the use of artificial turf surfaces in the run-off areas around both natural and artificial turf playing fields, a simplified testing protocol based on the testing of Football Turf fields has been developed to ensure a minimum quality for these areas.

The definition of the run-off area in terms of dimensions and surface quality is subject to the competition organiser's regulation. For FIFA the run-off area is defined as being 3 metres starting at the outer edge of the goal line and of the touch line.

7.1 Football Turf fields

For a field of play with an artificial turf surface, the run-off areas shall be of the same product and tested at 4 representative locations (one on each of the four sides) around the pitch including the area most likely to be used by the assistant referee. The product used in the run-off area, should be identical with the one in the field of play.

Characteristic	Test Method	Requirement	
		FIFA QUALITY PRO	FIFA QUALITY
Vertical ball rebound	FIFA 01	60cm - 85cm	60cm - 100cm
Shock Absorption	FIFA 04a	60% - 70%	55% - 70%
Vertical Deformation	FIFA 05a	4mm – 10mm	4mm – 11mm
Rotational Resistance	FIFA 06	30Nm - 45Nm	25Nm – 50Nm
Surface regularity of playing surface	FIFA 12	<10mm	<10mm
Product identification	-	Same as field of play	Same as field of play

7.2 Natural turf fields

For a field of play with a natural turf surface, the run-off areas shall be tested at 10 representative locations (at the test institute's discretion) around the pitch including at least 2 spots within the touchline areas most used by the assistant referee.

Characteristic	Test Method	Requirement	
		FIFA QUALITY PRO	FIFA QUALITY
Vertical ball rebound	FIFA 01	60cm - 85cm	60cm - 100cm
Shock Absorption	FIFA 04a	60% - 70%	55% - 70%
Vertical Deformation	FIFA 05a	4mm – 10mm	4mm – 11mm
Rotational Resistance	FIFA 06	30Nm - 45Nm	25Nm – 50Nm
Surface regularity of playing surface	FIFA 12	<10mm	<10mm

Due to the diverse nature of natural turf fields, it is strongly recommended to use a surface in the run-off area with as similar characteristics as the playing surface itself. This should be taken into consideration when selecting the product.

For avoidance of doubt, section 7 (both 7.1 and 7.2) does not constitute a part of the FIFA Quality Programme for Football Turf testing requirements but may have an impact on the eligibility to play competitive matches in accordance with the Laws of the Game and the regulations of the tournament organiser.

At the time of submitting a Football Turf for laboratory testing the Licensee shall provide the Accredited Test Laboratory with a fully descriptive list (including photographs) of all equipment required to under routine maintenance of the surface. This list shall form part of the FIFA Laboratory Test Report.

At each Field Test (initial and retests) the Test Institute will compare the Licensee's list of equipment to that present on site with supportive photographic evidence. Where the maintenance equipment is held by a third party it will be necessary for the licensee to supply a copy of the maintenance contract to the Testing Institute.

At handover of the field the Licensee shall provide the owner/operator with a maintenance log with instructions that the owner/operator complete it in accordance with the maintenance instructions.

When requesting a FIFA Field Test Report Number from FIFA in advance of the field retest the Licensee shall provide a copy of the maintenance log (in electronic format i.e. a scanned copy of original) for the preceding 12 months. If required by FIFA the Licensee shall translate the maintenance log into English.

When requesting a FIFA Field Test Report Number from FIFA in advance of an initial test or field retest the Licensee shall also confirm in writing the ground staff responsible for maintaining the field have been trained and are deemed competent; this shall include details of all training (including dates) undertaken.

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ANNEX A: Laboratory test report

ANNEX B: Field test report – FIFA QUALITY PRO

ANNEX C: Field test report – FIFA QUALITY

ANNEX D: Field test report – FIFA QUALITY PRO Retest

ANNEX E: Field report – FIFA QUALITY Retest

ANNEX F - General requirements

F1 Gloss

It is not acceptable to incorporate materials or constructions that will cause glare from the reflection of sunlight or artificial lighting to players.

F2 Bearing Capacity

The formation and sub-soil should have sufficient bearing capacity to support the playing surface and any machinery used to maintain the surface. The bearing capacity can be assessed using methods described by EN/TC 250/SC7. No responsibility shall be accepted for any damage caused to the surface by the use of equipment or structures (e.g. collapsible seating) that the surface was not intentionally designed for.

F3 Staining

Every effort should be employed to use non-staining materials where practicable.

F4 Toxicology

The manufacturer should be asked to supply to the purchaser an assurance that the sports surface together with its supporting layers, does not contain in its finished state any substance which is known to be toxic, mutagenic, teratogenic or carcinogenic when in contact with the skin. Furthermore that no such substances will be released as a vapour or dust during normal use.

F5 Environmental Compatibility

The manufacturer and purchaser shall abide by all local relevant environmental legislation during the construction, material utilisation, operation and disposal of the surface and its supporting layers.

F6 Climatic Conditions

The manufacturer and purchaser shall take into consideration the prevailing climatic conditions when designing the surface specification.

F7 Resistance to fire

When installing an artificial turf surface the manufacturer / supplier shall ensure the completed installation complies with all relevant building and fire safety regulations.

ANNEX G - Factory Quality Control Procedures

G.1 Introduction

This specifies a factory production control system for constituent components to ensure that they conform to the relevant requirements of this standard.

The performance of the factory production control system shall be assessed according to the principles used in this document.

Note: The overall quality of the surface remains the responsibility of the licensee.

G.2 Organization

G.2.1 Responsibility and authority

It will be necessary to produce a quality assurance line management diagram outlining the individuals responsible for quality. One individual shall be highlighted as the contact person in cases of quality disputes. These individuals should have the capability to:

- Initiate action to prevent the occurrence of product non-conformity;
- Identify, record and deal with any product quality deviations.

G.2.2 Management representative for factory production control

For every manufacturing plant the licensee must satisfy himself that an appropriately qualified person with appropriate authority will ensure that the requirements given in this document are implemented and maintained.

G.2.3 Management review

The factory production control system adopted to satisfy the requirements of this document shall be audited and reviewed at appropriate intervals to ensure its continuing suitability and effectiveness. Records of such reviews shall be maintained. It is assumed that for most manufacturers this would be covered within an ISO 9000 scheme.

G.3 Control procedures

The licensee shall establish and maintain a factory production control manual setting out the procedures by which the requirements for factory production control are satisfied for those products he directly produces. Furthermore they should establish similar procedures for all suppliers of products that are part of their systems.

G.4 Document and data control

Document and data control shall include those documents and data that are relevant to the requirements of this standard covering purchasing, processing, inspection of materials and the factory production control system documents.

A procedure concerning the management of documents and data shall be documented in the production control manual covering procedures and responsibilities for approval, issue, distribution and administration of internal and external documentation and data; and the preparation, issue and recording of changes to documentation.

G.5 Sub-contract services

If any part of the operation is sub-contracted by the producer a means of control shall be established. The producer shall retain overall responsibility for all components sub-contracted.

G.6 Knowledge of the raw material

There shall be documentation detailing the nature of the constituent parts as specified in the licensees Technical Data Sheets.

It is the licensee's responsibility to ensure that if any dangerous substances are identified their content does not exceed the limits in force.

Note: See EU Council Directive 76/769/EEC.

G.7 Management of production

The factory production control system shall fulfil the following requirements:

- There shall be procedures to identify and control the materials.

Note: these can include procedures for maintaining and adjusting processing equipment, inspection or testing material sampled during processing, etc.

- There shall be procedures to identify and control any hazardous materials identified above to ensure that they do not exceed the limits.
- There shall be procedures to ensure that material is put into stock in a controlled manner and the storage conditions are appropriate for the materials being stored.
- Certain materials are known to deteriorate in storage. There shall be procedures to ensure that material taken from stock has not deteriorated in such a way that its conformity is compromised.
- The product shall be identifiable up to the point of sale as regards source and type.

G.8 Inspection and test

G.8.1 General

The licensee shall ensure that they have all the necessary facilities, equipment and trained personnel to carry out the required inspections and tests.

G.8.2 Equipment

The licensee shall be responsible for the control, calibration and maintenance of inspection, measuring and test equipment

Accuracy and frequency of calibration shall be in accordance with the appropriate standards.

Equipment shall be used in accordance with documented procedures.

Equipment shall be uniquely identified.

Calibration records shall be retained.

G.8.3 Frequency and location of inspection, sampling and tests

The production control document shall describe the frequency and nature of inspections.

G.8.4 Records

The results of factory production control shall be recorded including sampling locations, dates and times and product tested with any other relevant information.

Where the product inspected or tested does not satisfy the requirement laid down in the specification, or if there is an indication that it shall not do so, a note shall be made in the records of the steps taken to deal with the situation (e.g. carrying out of a new test and/or measures to correct the production process).

The records required by all the clauses of this standard shall be included.

The records shall be kept for at least the statutory period.

Note: "Statutory period" is the period of time records are required to be kept in accordance with regulations applying at the place of production.

G.9 Control of non-conforming product

Following an inspection or test that indicates that a product does not conform, the affected material shall be:

- Reprocessed; or

- Diverted to another application for which it is suitable; or
- Rejected and marked as non-conforming.

All cases of non-conformity shall be recorded by the producer, investigated and if necessary corrective action shall be taken.

Note: Corrective actions can include:

- Investigation of the cause of non-conformity including an examination of the testing procedure and making any necessary adjustments;
- Analysis of processes, operations, quality records, service reports and customer complaints to detect and eliminate potential causes of non-conformity;
- Initiating preventive actions to deal with problems to a level corresponding to the risks encountered;
- Applying controls to ensure that effective corrective actions are taken;
- Implementing and recording changes in procedures resulting from corrective action.

G.10 Handling, storage and conditioning in production areas

The manufacturer shall make the necessary arrangements to maintain the quality of the product during handling and storage. This is of particular importance to those materials that may deteriorate in storage.

G.11 Transport and packaging

The producer's factory production control system shall identify the extent of his responsibility in relation to storage and delivery.

Products should be packaged appropriately to prevent any damage of the materials in transit. Any precautions necessary to achieve this during handling and storage of the packaged goods shall be marked on the packaging or accompanying documents.

G.12 Training of personnel

The producer shall establish and maintain procedures for the training of all personnel involved in the factory production system. Appropriate records of training shall be maintained.

G.13 Minimum test frequencies for general properties

The manufacturer shall be asked to give details of the frequency which the products are tested for compliance with the product data sheet. If it is felt that these are inadequate then extra testing may be requested and/or third party attestation.

G.14 Communication

Before any goods are to leave the factory for site installation the product quality assurance sheets should be signed and dispatched to a third party for attestation. These documents should state unequivocally the testing that has taken place and the frequency of testing.

The minimum testing that is acceptable is full compliance with the technical data sheet for that product. If the data sheet is deemed to be inadequate more testing can be requested to show compliance with the data sheet.

Only upon approval from the third party attestation should the goods be dispatched. This does not however pass the responsibility of quality assurance onto the third party. At all times the quality assurance of the product (including its constituent parts) and the installation is the sole responsibility of the licensee.

Third party attestation would usually be provided by the test laboratory undertaking the field test.

Site samples will be taken by third party's (FIFA accredited test laboratory or FIFA's appointed representatives) in accordance with the requirements of the FIFA Quality Programme for Football Turf. The above quality assurance measures are additional to the provisions outlined in the FIFA Quality Programme for Football Turf Manual.

G15 Design and construction verification

As requested by FIFA the FIFA licensee shall make available all design drawings and bills of quantities for any field submitted for FIFA certification together with details of materials actually used during the construction. This shall include:

- i) Depth of sub-base materials, density of sub-base materials (when compacted), tonnage of material delivered to site (checked against delivery notes)
- ii) Length and type of drainage pipes delivered to site (checked against delivery notes)
- iii) Quantity and quality of drainage aggregate delivered to site (checked against delivery notes)
- iv) Quantity and quality of synthetic grass delivered to site (checked against delivery notes)
- v) Quantity and quality of infill sand delivered to site (checked against delivery notes)
- vi) Quantity and quality of infill rubber/elastomer delivered to site (checked against delivery notes)
- vii) Quantity and quality of adhesive delivered to site (checked against delivery notes)
- viii) Quantity and quality of seaming tape delivered to site (checked against delivery notes)
- ix) Quantity and quality of sewing thread delivered to site (checked against delivery notes)
- x) Quantity and quality of sports equipment delivered to site (checked against delivery notes)
- xi) Quantity and quality of maintenance equipment delivered to site (checked against delivery notes)
- xii) Quantity and quality of edging kerbs delivered to site (checked against delivery notes)
- xiii) Quantity and quality of haunching materials delivered to site (checked against delivery notes)
- xiv) Quantity and quality of additional contract materials delivered to site for example perimeter paths (checked against delivery notes)
- xv) Quantity and quality of maintenance testing equipment delivered to site (checked against delivery notes)

All information shall be sent to:

**FIFA
FIFA Quality Programme for Football Turf
FIFA STRASSE 20
8044 ZURICH
SWITZERLAND**