

IRB DRAFT - NEW REGULATION 13

COMMENTS ON THE IRB PERFORMANCE SPECIFICATION FOR ARTIFICIAL SURFACES FOR RUGBY UNION. CONTRIBUTED TO BY MANUFACTURERS, INSTALLERS, TEST HOUSES AND CONSULTANTS FROM THE INDUSTRY AND COLLATED BY SAPCA.

17 OCTOBER 2003

Section 1: Introduction

Artificial surfaces, specifically synthetic turf, have recently been developed as suitable surfaces for association football (soccer) and the Governing bodies of FIFA, UEFA and the FA have developed a series of performance tests and criteria to set standards of acceptability of these surfaces for the sport of soccer up to the highest level.

The sports surfacing industry is working to produce products which will meet these exacting standards and, for instance, UEFA have grant-aided six European clubs to resurface their stadium pitches using this "Third Generation" technology in a two-year experiment which will carefully monitor the synthetic surface in the environment of professional soccer.

Although it is increasingly common for rugby and soccer to share the same natural grass pitch, there are important considerations to be taken into account when comparing the requirements of the two sports on synthetic surfaces. These basic differences might be broken down into:

- a. ***Player surface contact*** Rugby is a sport where players come into contact with the surface to a far greater degree, in a vastly different range of circumstances than soccer. The player may fall or be tackled at speed, may drop from in excess of three metres as a result of a lift at the lineout and may be forced into contact with the surface at a ruck or maul. Injury from contact with the surface can result in friction burns, concussion, dislocation and/or fractures.
- b. ***Forces on the playing surface.*** Due to the scrummage in rugby, substantial forces are transmitted to the playing surface and thus to the elements of the synthetic construction, the carpet, the shock-pad, the base, etc. Natural grass is self-repairing and re-generating but a synthetic turf carpet will require major repairs of seams, backing and or base construction if these forces exceed the design values.

- c. **Ball-surface contact.** Where sports such as soccer and hockey depend on the surface being even and consistent, to ensure a predictable ball roll and bounce, this is less the case in rugby where the shape of the ball produces an unpredictable bounce which is the very nature of the sport. This is not to say that highly variable surfaces would be acceptable but the degree of consistency and surface tolerance would have less effect on the game being played.

Consideration is given to all of these requirements in the discussion below.

In setting a Standard for rugby on synthetic surfaces, this Standard must serve all the interested parties, be credible and non-ambiguous. If this is not the case disputes will inevitably arise and, even worse, surfaces may be installed which could lead to the injury of players. It is to be hoped that the criteria contained in the Standard are based on a controlled testing regime on high-standard natural pitches and that this data will be made available to the industry at large.

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In the interests of clarity we have broken down the comments and opinions received into a further six distinct sections, namely:

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Section 2. The Test Methods

- 2.1 The test methods need to be fully detailed and published to allow any manufacturer, contractor, test house, etc., to carry out their own tests to aid product development and to monitor installations and new products.

Restricting the test method data to a few laboratories is anti-competitive and a barrier to research and development. In the

past, the industry has experienced the tendency of governing bodies of sport such as IAAF, FIH, FIFA, etc., to attempt to limit the approved test labs and this has been to the detriment of the commercial development of surfaces and systems and the acceptance of standards.

- 2.2 Any test method needs to be precisely described to ensure acceptable levels of reproducibility and repeatability. In every case “round robin” testing should be undertaken on all test methods to ensure that the tests will meet this requirement. Failure to ensure acceptable reproducibility and repeatability can lead to acceptable products or pitches being unfairly rejected and unacceptable surfaces passed. Consumers and manufacturers need to have confidence that any test result is valid and will be replicated by any competent/accredited laboratory anywhere in the world. Have round robin tests been carried out for each property and are the results available?
- 2.3 Throughout the test methods, reference is made to a number CEN (EN) test methods. Most of these are only at draft stage and have yet to be subject of a public review, revision and ratification by the relevant CEN committee.

Until CEN test methods are published for public comment, their circulation is restricted to members of the Working Groups and Technical Committees. This means that most manufacturers, national associations and test houses have no access to the proposed methods of test. How then can these bodies comment on the suitability of the test methods proposed by the IRB?

Without a wide international circulation of the document and cognisance taken of the resulting comment, the standard is unlikely to receive general acceptance in the market place.

- 2.4 Several of the test procedures specified measure the same property using two very different pieces of test equipment. This can lead to errors and disputes. Is the system required to pass on one or both? What happens if it fails on one but not the other? Feedback from European countries drafting the CEN methods suggests that test methods that allow more than one protocol, to measure the same property, will be rejected.
- 2.5 There is no mention in the document of the potential hazard from infill materials in the turf fibres. With the degree of upper body and head contact with the surface that exists in rugby, it would be

prudent to ensure that infill materials, which might enter a player's mouth, are certified as non-toxic.

Section 3. The Properties/Requirements of the Test Methods

3.1 Identification Methods

Bulk density is to be measured using an EN. This is an incomplete reference. What procedure is to be used?

Fibre identification is to be carried out by DSC which is a piece of equipment, not a published test method.

3.2 Durability

Given the fact that the forces imposed on a rugby surface are significantly greater than any other sport (see Section 1 above) it is surprising that there is no requirement for the strength (tensile properties) of the carpet or a test to determine the ability of the carpet to resist creep (stretch) as these forces take effect.

3.3 Joint Strength

A significant number of papers have been written on the subject of forces generated by the scrummage in rugby (Quarrie & Wilson 1999, Millburn 1990 & 1993, Rodano & Pedotti 1988). Have the conclusions from these works been addressed in reaching the joint strength requirement of $>25\text{N/mm}^2$? (BS 7044 specifies 0.25N/mm^2 .)

The test method quoted measures "Peel Strength" and it is unlikely that a bonded seam will achieve this value. The forces which cause concern are tensile and the equivalent BS7044 value is 15N/mm^2 using a different test. If it is intended that the 25N/mm^2 relates to a tensile test then, to achieve such a value, carpet joints will require to be stitched with consequential implications on local G_{max} and force reduction properties.

3.4 UV Water/Heat

The test method is a prEN (pre-norm or draft standard) and is yet to be ratified and published.

3.5 Shock Absorbency

The test method is shown as EN and is incomplete. What test method is to be used? The CEN/IRB test methods allow two different machines to measure the same property. This is likely to lead to dispute and question the validity of the Standard. Since

this property safeguards the player its credibility needs to be beyond question.

On what basis has the requirement of 60-75% been established? Is it based on biomechanical data, testing of existing natural grass pitches or the analysis of products in the market place? Bearing in mind the comments in Section 1 above, where will liability lie in the event of a player injury due to impact with an approved surface?

For the Gmax test, ASTM F355 allows for a number of different head-forms. Which one is to be used and from what drop height?

The IRB needs to be certain that a surface meeting this requirement will ensure head impacts will not cause serious injury and current biomechanical papers suggest that the measure of Head Injury Criteria (as used for playground safety surfacing) is more appropriate than Gmax.

3.6 Vertical Deformation

The EN test reference is incomplete. What procedure is intended to be used? The draft CEN method has yet to be subjected to public review prior to ratification by the CEN Technical Committee and publication.

As in 3.5 above the standard has two requirements, the low impact Stuttgart Athlete and the high impact Sport Floor Tester. Does the surface, again, have to meet both?

The deformation requirements are the same as specified by FIFA but the level of shock absorbency in the IRB document is greater. The increased pile length, stipulated by IRB, combined with the greater level of shock absorbency, will result in the stipulated deformation requirement being difficult to achieve. On what basis was this requirement established?

3.7 Traction

The reference to EN is in error. There is no traction test in the CEN standard and there is no intention to produce one within the current work programme. What procedure is to be used?

3.8 Slip Resistance

The reference to the test method is NSF-modified Le Roux. What procedure is to be used? What test foot is to be used? Presumably a studded foot, but then the configuration is required.

Experience of this test method, when used for football, shows that its ability to discriminate between different forms of “Third Generation” surfacing is poor and this led UEFA to conclude that it is not suitable for “Third Generation” surfaces.

As linear (translational) friction is a very important property for rugby players, has this test really demonstrated its suitability?

3.9 Abrasiveness

No test method is specified. Has the test method been subjected to reproducibility and repeatability testing using a statistically based number of lab tests?

What is the basis of the requirement 'no scratches on film'?

3.10 Abrasiveness Friction

As in 3.9 above what test method is used, etc?

What is the basis of the requirement 30-50%?

As discussed in Section 1, injury from friction burns is a common problem on synthetic surfaces and is likely to be worse in rugby than in soccer. It is essential that the carpet manufacturers are aware of the test methods and agree that the limits chosen are appropriate and achievable.

3.11 Energy Restitution

As in 3.9 and 3.10 above, what is the test method and what is the basis of the requirement of 30-50%?

3.12 Vertical Ball Rebound

As in previous examples of CEN tests the EN 12235 has not yet been published so the reference is wrong. It is still a prEN (pre-norm draft standard).

This draft procedure does not refer to rugby, so details of ball type, pressure, etc., are not available. The CEN procedure also expresses the rebound as a percentage of the rebound on concrete where the IRB document appears to use the absolute rebound as a percentage of drop height, thus the test method is not EN 12235.

The reproducibility of the test method with a soccer ball has proven difficult. A rugby ball is likely to create greater problems due to the fact that its rebound is unlikely to be consistently vertical.

3.13 Angled Ball Behaviour

What test method is to be used and has it been subjected to repeatability tests with a rugby ball?

On what basis has the requirement of 50-70% at 50km/hr with an impact angle of 25 degrees been established?

Bearing in mind the comments in the introduction, Section 1, is a test for this property really required?

3.14 Evenness

Is EN 22768 the correct test method?

The requirement of <10mm under a 3 metre straight edge is very tight. Is this a sensible requirement in the light of comments in Section 1? Would a natural grass pitch ever satisfy this requirement?

The action of a scrum, ruck or maul is likely to displace the fill in a carpet with 65mm pile height to a greater degree than 10mm.

3.15 Slope

Is EN 22768 the correct test method? This document is titled "*General tolerances. Tolerances for linear and angular dimensions without individual tolerance indication*".

3.16 Base Permeability

Why is the requirement 180mm/hr when most standards quote 100mm/hr?

Section 4: The Consultation Process

- 4.1 The document acknowledges various individuals and bodies who have contributed to the preparation of the document. On what basis were they selected? Was it intended to extend this process to ensure that the entire industry (i.e. worldwide) would be able to contribute?
- 4.2 There is a potential commercial advantage given to manufacturers and test houses who have already been involved in the consultation and the production of the document. One of the reasons behind the existence of a trade association such as SAPCA is to help to ensure that consultation on standards such as this can be undertaken across the whole spectrum of the industry. This currently happens with organisations such as the Lawn Tennis Association, UK Athletics, Sport England, the Football Association, etc., to the considerable advantage of all concerned.
- 4.3 The introduction of a dramatically different surface for rugby should merit consultation with the individuals who are most involved with the game and are most at risk from any mistakes made. These individuals would include: players, coaches, physios, medical teams and groundsmen. No mention is made of these individuals in the consultation process.
- 4.4 Will this document, produced by SAPCA, form part of the consultation process?
- 4.5 From discussion with several of the acknowledged bodies in the draft IRB document it seems that the level of input has been minimal. One of the test houses quoted has not received a copy of the standard and did not know they were an approved test house!

Section 5: The Selection of Test Houses

- 5.1 On what basis have the test institutes been selected and how do others apply for inclusion in the list? What will be the selection criteria and will the system comply with EU competition laws?
- 5.2 As stated in Section 2.1, a policy which limits the number of approved test houses has been shown to be unsatisfactory in the past. If disputes arise within the United Kingdom with only one approved test house, arbitration is impossible without reference to an organisation outside the UK. Restricting testing to one test house also inhibits research and development and leads to uncontrolled pricing of the service.
- 5.3 As stated in Section 4.5, at least one of the “Selected Test Institutes” did not know of their selection and does not have a copy of this document.
- 5.4 Why can some laboratories only make field tests whilst others are considered competent for Type and Field testing? To allow fair competition, would it not be sensible only to accredit laboratories who can undertake all of the testing programme?

Section 6: The Use of the Final Document

- 6.1 How is the final document intended to be used?
- 6.2 Do the IRB intend to introduce a product licensing and facility registration scheme?
- 6.3 How will the scheme be policed and what will be the validity timescale of the product evaluation?
- 6.4 The inference throughout the IRB document is that it represents a standard which will be acceptable for rugby at the highest level. If the objectives, at this stage in the development of surfaces and standards, were lowered to cover only facilities for training, it would be easier to resolve some of the issues raised in this SAPCA document.
- 6.5 Given that the National Unions accept the final document, what level of rugby is envisaged? Would “Six Nations” matches potentially be played on such a facility?
- 6.6 The properties of the final surface may well render the facility uncomfortable and unsuitable for other sports such as soccer. It will certainly be unsuitable for hockey to any real standard. The installer will need to appreciate that the utilisation is likely to be 100% rugby.
- 6.7 Other sports governing bodies, such as the FA, have identified correct maintenance procedures as being a key component in ensuring quality pitches that will retain the performance criteria. Will a separate document on maintenance be produced?
- 6.8 Do the IRB intend to extend these performance requirements, where appropriate, to natural turf pitches?
- 6.9 What is the insurance liability situation? With the certainty that injury will occur and, in this litigious society, compensation will be sought, who will be responsible for appropriate insurance cover? Will insurers insist on the pitch being tested to comply with IRB criteria and will they need to be assured that these criteria are sufficiently protective of the player?

Section 7: Proposals on the Way Forward

- 7.1 Use the IRB standard document, modified as seen fit with SAPCA's comments, as a reference document for a wider debate on the criteria required for competitive rugby on synthetic surfaces.
- 7.2 On an interim basis, restrict synthetic surfaces in rugby to training pitches and facilities where the development of the standards can be monitored and user reaction collated.
- 7.3 Release all available data on surface properties, which has been collected for this and other documents, into the public domain. This would help to ensure that any debate on the relevance of test methods and criteria is equally well informed whether it is in the scientific or manufacturing domain.
- 7.4 Convene a working group of individuals who have interest in, and knowledge of, the subject of performance testing and the sport of rugby and who should be charged with developing a standard acceptable to the player and the manufacturer. This will require to be appropriately funded since test areas will need to be established to demonstrate the effects of applying a range of potentially conflicting criteria to a surface design.
- 7.5 Approach UEFA for access to their feedback on the six pilot projects they have sponsored throughout Europe and analyse the data for areas of common ground and input into the final standard.