



Test Report

IMPORTANT NOTE:

This report does **not** constitute ITF Court Pace Classification as recognised in the Rules of Tennis.

Test type: Classification

Test code: ITF CS/01/02-07-101

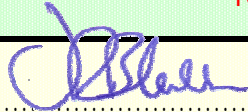
Test location: Laboratory

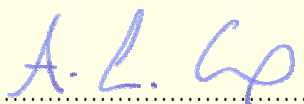
Surface name: Tournament XP PRO

Surface type: Artificial grass

Test laboratory: Labosport
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Heanor
Derbyshire
DE75 7RJ, England

Client: Actionsports International Limited
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Distribution: Copy 1 - Labosport
Copy 2 - Actionsports International Limited
Copy 3 - ITF

Test date: 17 December 2007

Issue date: 17 December 2007

NOTE: An application for ITF Classification must be submitted within 1 year of the test date.

Coefficient of restitution (COR): 0.84 Medium

Coefficient of friction (COF): 0.63 Medium

Court pace rating (CPR): **32** **Medium-slow**

Test Explanation - Court Pace :

ITF CS/01/02-07-101



Test protocol:

1. Tests onsite shall be undertaken on a court that is less than four months old. Prior to the tests being made the courts shall be prepared using the manufacturer's, supplier's or contractor's approved procedures. The body requesting the testing shall undertake this work. Tests should not be made until the court surface has been given sufficient time to stabilise.
2. If the testing is undertaken in the laboratory, four samples, each measuring a minimum of 0.5 × 0.5 m in area, shall be submitted to the ITF Accredited laboratory. The laboratory shall select three samples at random and test each. Where the sample incorporates loose particulate materials the body requesting the tests shall prepare the samples in the laboratory.
3. Unless the surface is designed to be damp/wet when in its optimum condition, tests shall be made with the surface in a dry condition.
4. If the surface has an inherent directional pattern, such as the lay of the pile of artificial grass, etc., carry out tests such that a set of readings is obtained in directions giving maximum and minimum values of angle rebound.
5. When commissioning the Court Pace assessment the company requesting the tests shall provide a detailed specification of the court/surface construction. The information will be included in this report.
6. The ITF Accredited laboratory will retain a reference sample of the surface tested as follows:
 - a. When the tests are carried out on-site on a synthetic surface, the company commissioning the testing shall supply one 0.5 × 0.5 m sample of the surface to the laboratory. The laboratory shall have responsibility for verifying that the surface tested on site is the same as that offered as a reference sample.
 - b. When the tests are carried out on clay or other water bound mineral surfaces the ITF Accredited laboratory shall remove a 1 kg sample of the surfacing and the top 75 mm of foundation material. The laboratory shall retain these materials as a reference.
 - c. When tests are undertaken in the laboratory one of the specimens actually tested shall be retained, as a reference.
7. On completion of the tests, the ITF Accredited laboratory will complete this report. One copy of the report will be sent to the body requesting the tests and one copy to the ITF. On receipt of this report the company may apply to the ITF for inclusion on the ITF list of classified tennis court surfaces.

Notation definitions & calculation of results:

- v_{ix} = horizontal incident velocity (m/s)
 v_{iy} = vertical incident velocity (m/s)
 v_{fx} = horizontal rebound velocity (m/s)
 v_{fy} = vertical rebound velocity (m/s)
 e = coefficient of restitution (COR)
 μ = coefficient of friction (COF)
 k = pace correction factor
 a = pace perception constant (150)
 b = mean COR for all surface types (0.81)
CPR = court pace rating

$$e = \frac{v_{fy}}{v_{iy}} \quad \mu = \frac{v_{ix} - v_{fx}}{v_{iy}(1 + e)}$$

$$k = a(b - e)$$

$$CPR = 100(1 - \mu) + k$$

Procedure for obtaining ITF Court Pace Classification:

1. Contact the ITF Technical Centre by email to technical@itftennis.com to obtain an application form and a quotation for the classification fee.
2. Submit the completed application form to the ITF, from which the ITF shall raise an invoice.
3. Upon receipt of payment the surface will become ITF Classified and a certificate will be issued. The surface will be listed on the ITF website www.itftennis.com/technical and also published in the January issue of "ITF Approved Balls & Classified Court Surfaces" booklet.
4. ITF Classification is valid for 3 years from date of listing. If a company wishes a product to remain on the ITF Classified list, it shall arrange for the product to be reassessed by an ITF Accredited laboratory within 6 months prior to expiry.

Notes:

- a. The ITF reserves the right to refuse to classify a surface product which it does not consider to be suitable for the game of tennis.
- b. A surface product included on the list of ITF Classified Court Surfaces is classified purely on the basis of its court pace rating. ITF Classification listing does not imply any form of ITF approval or endorsement.

Test Results - Court Pace : ITF CS/01/02-07-101



Surface name: Tournament XP PRO
Surface type: Artificial grass

Temperature: 24°C
Humidity: 53%

Test laboratory: Labosport
Test date: 17 December 2007

SAMPLE 1:

| | Shot 1 ^(Ball 1) | Shot 2 ^(Ball 2) | Shot 3 ^(Ball 3) | Shot 4 ^(Ball 1) | Shot 5 ^(Ball 2) | Shot 6 ^(Ball 3) | Shot 7 ^(Ball 1) | Shot 8 ^(Ball 2) | Shot 9 ^(Ball 3) |
|----------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| V_{ix} | 27.35 | 28.58 | 30.62 | 30.69 | 30.25 | 30.53 | 29.51 | 29.38 | 28.90 |
| V_{iy} | 7.27 | 7.69 | 8.25 | 8.05 | 7.98 | 8.04 | 7.95 | 7.72 | 7.77 |
| V_{fx} | 18.34 | 19.15 | 20.59 | 20.89 | 20.99 | 21.07 | 20.90 | 19.79 | 19.95 |
| V_{fy} | 5.87 | 6.23 | 6.95 | 6.61 | 6.71 | 7.03 | 6.75 | 6.50 | 6.48 |
| COR | 0.81 | 0.81 | 0.84 | 0.82 | 0.84 | 0.87 | 0.85 | 0.84 | 0.83 |
| COF | 0.69 | 0.68 | 0.66 | 0.67 | 0.63 | 0.63 | 0.59 | 0.67 | 0.63 |
| CPR | 31.8 | 32.2 | 29.1 | 31.5 | 32.3 | 27.6 | 35.6 | 27.8 | 33.6 |

SAMPLE 2:

| | Shot 1 ^(Ball 4) | Shot 2 ^(Ball 5) | Shot 3 ^(Ball 6) | Shot 4 ^(Ball 4) | Shot 5 ^(Ball 5) | Shot 6 ^(Ball 6) | Shot 7 ^(Ball 4) | Shot 8 ^(Ball 5) | Shot 9 ^(Ball 6) |
|----------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| V_{ix} | 29.77 | 29.58 | 29.17 | 29.48 | 29.51 | 29.54 | 30.78 | 29.15 | 29.55 |
| V_{iy} | 8.01 | 7.98 | 7.85 | 7.73 | 7.76 | 7.72 | 8.25 | 7.64 | 8.01 |
| V_{fx} | 20.66 | 20.61 | 20.81 | 20.17 | 20.50 | 20.72 | 21.19 | 20.14 | 20.15 |
| V_{fy} | 6.63 | 6.73 | 6.69 | 6.66 | 6.49 | 6.67 | 7.08 | 6.52 | 6.43 |
| COR | 0.83 | 0.84 | 0.85 | 0.86 | 0.84 | 0.86 | 0.86 | 0.85 | 0.80 |
| COF | 0.62 | 0.61 | 0.57 | 0.65 | 0.63 | 0.61 | 0.63 | 0.64 | 0.65 |
| CPR | 35.1 | 34.0 | 36.2 | 27.6 | 32.8 | 30.6 | 30.2 | 29.9 | 36.0 |

SAMPLE 3:

| | Shot 1 ^(Ball 7) | Shot 2 ^(Ball 8) | Shot 3 ^(Ball 9) | Shot 4 ^(Ball 7) | Shot 5 ^(Ball 8) | Shot 6 ^(Ball 9) | Shot 7 ^(Ball 7) | Shot 8 ^(Ball 8) | Shot 9 ^(Ball 9) |
|----------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| V_{ix} | 29.51 | 28.88 | 28.91 | 30.58 | 29.19 | 29.63 | 29.98 | 28.24 | 28.91 |
| V_{iy} | 7.97 | 7.81 | 7.84 | 8.21 | 7.88 | 8.08 | 8.00 | 7.62 | 7.74 |
| V_{fx} | 20.07 | 20.12 | 19.46 | 21.26 | 20.40 | 19.92 | 21.35 | 19.03 | 20.36 |
| V_{fy} | 6.46 | 6.48 | 6.75 | 7.28 | 6.37 | 6.80 | 6.96 | 6.19 | 6.47 |
| COR | 0.81 | 0.83 | 0.86 | 0.89 | 0.81 | 0.84 | 0.87 | 0.81 | 0.84 |
| COF | 0.65 | 0.61 | 0.65 | 0.60 | 0.62 | 0.65 | 0.58 | 0.67 | 0.60 |
| CPR | 34.5 | 35.7 | 27.6 | 28.3 | 38.6 | 30.0 | 33.3 | 33.0 | 35.9 |

Test Summary - Court Pace : ITF CS/01/02-07-101

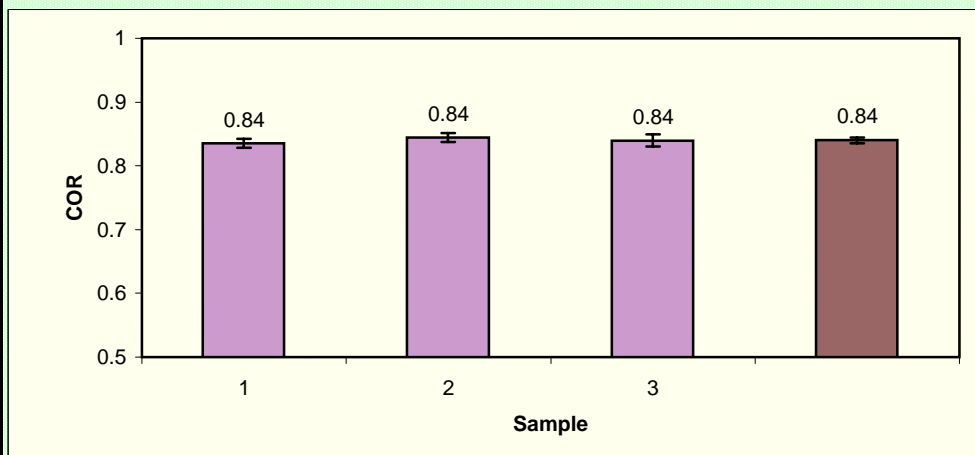


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Surface type: Artificial grass

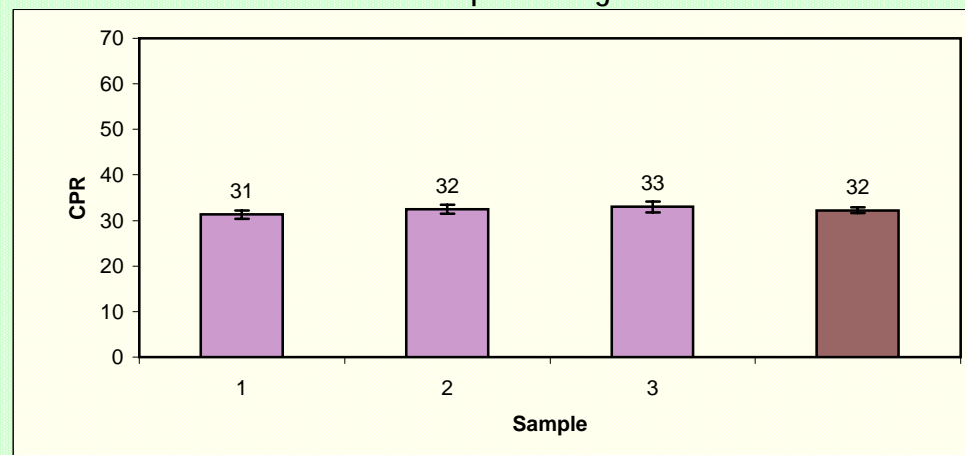
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Test laboratory: Labosport
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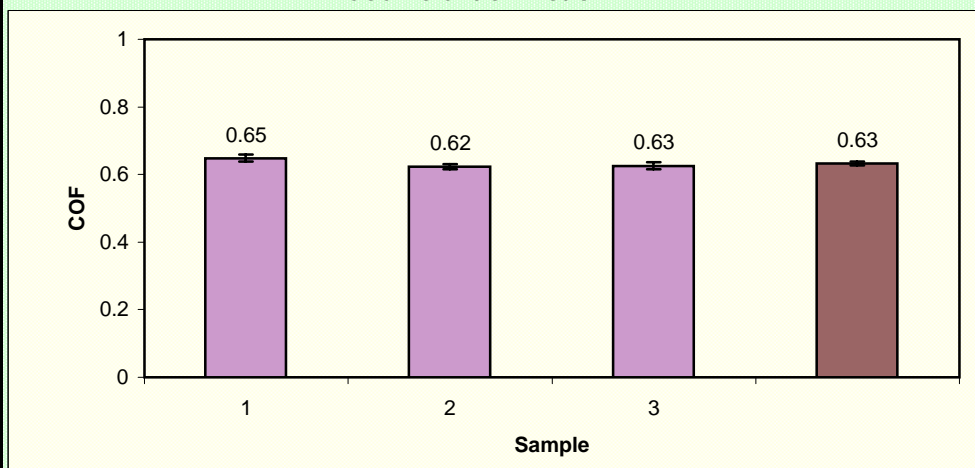
Coefficient of restitution



Court pace rating



Coefficient of friction



Summary

| | COR | COF | CPR |
|-------|------|------|-----|
| Mean | 0.84 | 0.63 | 32 |
| SE | 0.00 | 0.01 | 1 |
| Range | 0.01 | 0.03 | 2 |

ITF criteria:

COR Low (0 - 0.78) Medium (0.79 - 0.84) High (0.85+)

COF Low (0 - 0.55) Medium (0.56 - 0.70) High (0.71+)

CPR Slow (0 - 29) Medium-slow (30 - 34) Medium (35 - 39) Medium-fast (40 - 44) Fast (45+)

Test Comments - Court Pace :

ITF CS/01/02-07-101



Surface name: Tournament XP PRO
Surface type: Artificial grass

Temperature: 24°C
Humidity: 53%

Test laboratory: Labosport
Test date: 17 December 2007

Full description of court surface - including manufacturer's reference, the type of supporting layers and their method of attachment:

Product Specification

Colour Emerald Green
Roll Width 3.71m

Yarn

Composition Thiolon XP Pro
D-tex 8800
Tape Thickness $90\mu\text{m}\pm 5\mu\text{m}$
Tape Width 10mm

Carpet

Pile Height $16\text{mm}\pm 1\text{mm}$
Gauge 5/16inch
Stitches per 10cm 27 ± 1
Stitches per m^2 34020 ± 100
Total Yarn Weight $1140\text{g}/\text{m}^2\pm 10\%$

Backing

Primary Backing PP + mesh scrim inlay
Weight $210\text{g}/\text{m}^2$
Secondary Backing Latex
Weight $980\text{g}/\text{m}^2\pm 10\%$
Total carpet weight $2330\text{g}/\text{m}^2\pm 100\text{g}/\text{m}^2$

Infill

Silica sand Rounded 0.2mm - 0.8mm $16\text{kg}/\text{m}^2$

Laboratory comments:

Although the tests were carried out on laboratory samples the appearance and finish of the test specimens was considered by Labosport to be representative of the surface when laid as a tennis court.

A tennis court surface is defined as the top (playing) surface and any underlying layers of the construction that influence the sports performance (or bio-mechanical) response of a court. If any elements of the surface's construction change the response, performance and classification of the surface may be different. As such the results detailed in this report only apply to the surface when laid on a rigid (concrete, asphalt, etc.) base.

Laboratory recommendations:

The results detailed in this report are considered to be a valid assessment of the Surface Pace characteristics of the product. In Labosport's opinion the product satisfies the technical criteria required of tennis court surfaces wishing to appear in the ITF's Court Surface Classification Scheme. Labosport recommend, subject to ITF approval, that the surface is included on the list of classified surfaces.