





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/01/02-09-065
Test location: Laboratory
Surface name: FAST TRACK 15
Surface type: Artificial grass
Test laboratory: ISA Sport
P.O Box 721
6800 AS Arnhem
The Netherlands

Client: Juta a.s.
Zirecka Podstran
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Distribution: Copy 1 - ISA Sport
Copy 2 - Juta a.s.
Copy 3 - ITF
Test date: 27th May 2009
Issue date: 9th June 2009

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

Coefficient of restitution (COR): 0,80 Medium
Coefficient of friction (COF): 0,58 Medium
Court pace rating (CPR): 44 **Medium-fast**

Test Explanation - Court Pace :

ITF CS/01/02-09-065



Test protocol:

1. Tests onsite shall be undertaken on a court that is less than four months old. Prior to testing, the court shall be prepared using the manufacturer, supplier and/or contractor's procedures. The body requesting the test shall undertake this work. Tests should not be made until the court surface has been given sufficient time to stabilise, as advised by the contractor.
2. If the testing is undertaken in the laboratory, four samples, each measuring a minimum of 0.5 x 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 test shall advise the laboratory on the preparation of samples.
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. For any surfaces that have an inherent directional pattern – such as natural or artificial grass – test shots should be fired in the typical directions of play, i.e. parallel to the length of the court. Where samples are used, the supplier shall indicate the direction the surface would be laid on court.
5. When commissioning the Court Pace assessment, the body requesting the test 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 onsite on a synthetic surface, the body requesting the test shall supply one 0.5 x 0.5 m sample of the surface to the laboratory. The laboratory shall have responsibility for verifying that the surface tested onsite 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 test 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_{kx} = horizontal rebound velocity (m/s)

V_{ky} = 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

$$e = \frac{V_{ky}}{V_{iy}}$$
$$\mu = \frac{V_{kx} - V_{ix}}{V_{iy}(1 + e)}$$

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

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

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/01/02-09-065



Surface name: FAST TRACK 15
Surface type: Artificial grass

Temperature: 22°C
Humidity: 50%

Test laboratory: ISA Sport
Test date: May 27th 2009

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}	30,49	30,02	30,03	30,10	30,29	30,68	29,23	30,11	30,55
V _{iy}	8,92	8,87	8,89	8,89	8,88	9,00	8,48	8,72	8,84
V _{fx}	21,62	20,72	20,62	20,58	21,11	21,54	20,19	20,89	21,41
V _{fy}	7,09	6,80	6,83	7,06	7,02	7,11	6,66	6,84	7,06
COR	0,80	0,77	0,77	0,79	0,79	0,79	0,79	0,78	0,80
COF	0,55	0,59	0,60	0,60	0,58	0,57	0,60	0,59	0,57
CPR	46,9	47,1	46,4	42,6	45,2	46,3	43,9	44,5	44,3

SAMPLE 2:

	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}	30,22	29,07	30,16	29,26	30,44	30,66	29,13	30,27	29,88
V _{iy}	8,85	8,58	8,86	8,44	8,73	8,89	8,59	8,64	8,66
V _{fx}	21,48	20,24	21,14	20,42	21,67	21,14	20,28	21,26	20,95
V _{fy}	7,40	6,97	7,11	6,61	7,16	6,81	7,00	6,78	7,02
COR	0,84	0,81	0,80	0,78	0,82	0,77	0,81	0,78	0,81
COF	0,54	0,57	0,56	0,59	0,55	0,61	0,57	0,58	0,57
CPR	42,3	42,9	44,6	45,3	43,3	46,0	42,6	45,4	43,0

SAMPLE 3:

	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}	29,97	30,56	30,00	29,90	30,22	30,22	28,83	28,76	29,14
V _{iy}	8,65	8,88	8,71	8,54	8,77	8,89	8,34	8,41	8,47
V _{fx}	21,18	21,27	20,86	21,10	21,26	20,85	20,12	20,00	20,30
V _{fy}	6,83	7,04	6,88	6,86	7,13	7,10	6,70	6,57	6,81
COR	0,79	0,79	0,79	0,80	0,81	0,80	0,80	0,78	0,80
COF	0,57	0,58	0,59	0,57	0,56	0,59	0,58	0,58	0,58
CPR	46,3	44,2	44,3	43,9	43,2	43,1	43,0	45,8	43,0

Test Summary - Court Pace : ITF CS/01/02-09-065



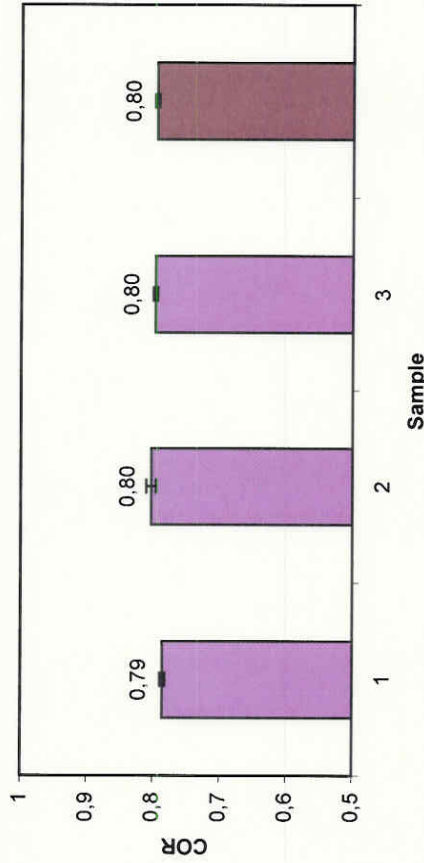
Surface name:
Surface type:

Fast Track 15
Artificial grass

Temperature: 22°C
Humidity: 50%

Test laboratory: ISA Sport
Test date: May 27th 2009

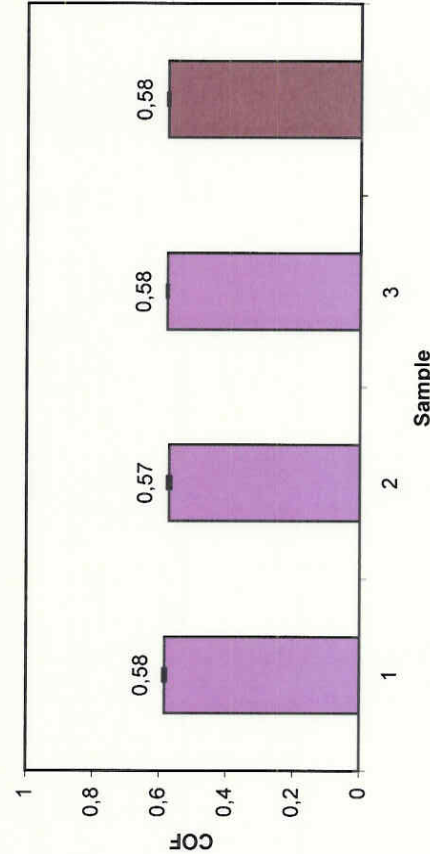
Coefficient of restitution



Court pace rating



Coefficient of friction



Summary

	COR	COF	CPR
Mean	0,80	0,58	44
SE	0,00	0,00	0
Range	0,02	0,01	1

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/01/02-09-065

Surface name: FAST TRACK 15
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Humidity: 50%

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

fibre length: 15 mm polyethylene
sand infill: 16 kg/m², ST 03/08
base: concrete

Laboratory comments:

ISA Sport defines a tennis court surface as the top (playing) surface and any underlying layers of 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.

Laboratory recommendations:

The results detailed in this report are considered to be a valid assessment of the Court Pace characteristics of the product. In ISA Sport's opinion the product satisfies the technical criteria required of tennis court surfaces wishing to appear in the ITF's Court Surface Classification Scheme.

Additional test information:

Test ball: 2008 ITF Hi-specification balls (PHI)