

Surface Test Report

IMPORTANT NOTE:

This report does **not** constitute an ITF Court Pace Classification.

Test type: Classification
Test code: ITF CS/01/02-14-407
Test location: Laboratory
Surface name: RESITOP STANDARD
Surface type: Acrylic
Test laboratory: LABOSPORT
Technoparc du Circuit des 24h00
72100 LE MANS
France

Client: Pinturas Serrano 2011 S.L.
Poligono Industrial El Salvador
Avenida 2° Parcela 81
02630 LA RODA (ALBACETE)
SPAIN

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Distribution: Copy 1 - LABOSPORT
Copy 2 - Pinturas Serrano 2011 S.L.
Copy 3 - ITF

Test date: May 28th, 2014

Issue date: June 19th, 2014

NOTE: An application for ITF Classification must be submitted within 6 months of the issue date.

| | | |
|-----------------------------------|-----------|-----------------|
| Coefficient of restitution (COR): | 0,80 | Medium |
| Coefficient of friction (COF): | 0,63 | Medium |
| Court pace rating (CPR): | 39 | Medium |
| Alternative category * | | Medium-fast |
| Agreed classification | | ITF to complete |

* see note 11 of Test protocol on Explanation page of this report

Test Explanation - Court Pace :

ITF CS/01/02-14-407

Test protocol:

1. For tests in the laboratory, the ITF Accredited laboratory requires either three samples of minimum dimensions 0.5×0.5 m, or (in the case of infilled and carpet surfaces) one sample measuring 1×1 m. In addition, a reference sample shall be sent to the ITF Technical Centre.
2. Test specimens should be flat. The body requesting the test should advise the laboratory on the preparation and storage of samples.
3. The body requesting the test is required to provide a detailed specification of the surface construction, which will be included in the Comments page of this report.
4. The test specimens shall be conditioned at $23 \pm 2^\circ\text{C}$ for a minimum of 3 hours prior to testing. 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.
5. The laboratory shall use three high-specification balls to test the surface. The balls should be stored in their cans at $23 \pm 2^\circ\text{C}$ and pre-compressed before use.
6. The test balls shall be fired at an incident angle of $16 \pm 2^\circ$ and speed of 30 ± 2 m/s onto the surface, and the ball velocity shall be recorded before and after the impact.
7. Each of the three test balls shall be fired onto the surface three times (nine impacts in total), moving impact location for each shot. If the surface is disturbed or damaged by the test (e.g. movement of clay particles), the surface shall be restored before the next shot.
8. For any surfaces that have an inherent directional pattern – such as natural or artificial grass – test shots shall 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.
9. The temperature of the tests balls, surface and ambient conditions shall be monitored during the test, along with the relative humidity of the laboratory.
10. On completion of the test, the ITF Accredited laboratory will submit this test report to the ITF and subsequently to the body requesting the test. On receipt of this report, the body requesting the test may apply to the ITF for inclusion on the ITF list of classified tennis court surfaces. An application for ITF Classification must be submitted within 6 months of the report issue date.
11. If the mean CPR value for the three samples lies within 2 points of an adjacent category, the body requesting the test will be given the choice between the two categories.

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)
 T = mean ball temperature for test sample ($^\circ\text{C}$)
 c = temperature coefficient (0.003)
 e_T = coefficient of restitution (COR)
 a = pace perception constant (150)
 b = mean COR for all surface types (0.81)
CPR = court pace rating

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

$$e_T = e + c(23 - T)$$

$$\text{CPR} = 100(1 - \mu) + a(b - e_T)$$

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 "ITF Approved Balls, Classified Surfaces & Recognised Courts" booklet.
4. ITF Classification is valid for 3 years from date of listing. If a client 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/01/02-14-407

Surface name: RESITOP STANDARD

Humidity: 52%

Test laboratory: LABOSPORT

Surface type: Acrylic

Ambient temp: 24°C

Surface temp: 24°C

Test date: May 28th, 2014

SAMPLE 1:

Mean ball temp: 24°C

v_{ix}

v_{iy}

v_{fx}

v_{fy}

COR_T

COF

CPR

| 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) |
|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| 29,53 | 29,31 | 29,67 | 28,98 | 28,14 | 29,94 | 29,86 | 28,93 | 29,66 |
| 8,49 | 8,48 | 8,57 | 8,37 | 8,14 | 8,62 | 8,54 | 8,31 | 8,59 |
| 20,04 | 19,51 | 19,72 | 19,41 | 19,05 | 19,97 | 19,88 | 19,29 | 19,89 |
| 6,70 | 6,77 | 6,90 | 6,56 | 6,52 | 6,85 | 6,80 | 6,67 | 6,74 |
| 0,79 | 0,80 | 0,80 | 0,78 | 0,80 | 0,79 | 0,79 | 0,80 | 0,78 |
| 0,63 | 0,64 | 0,64 | 0,64 | 0,62 | 0,64 | 0,65 | 0,64 | 0,64 |
| 40,9 | 37,8 | 36,8 | 40,1 | 39,6 | 38,1 | 37,2 | 37,0 | 40,4 |

SAMPLE 2:

Mean ball temp: 24°C

v_{ix}

v_{iy}

v_{fx}

v_{fy}

COR_T

COF

CPR

| 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) |
|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| 29,30 | 28,32 | 29,68 | 30,38 | 29,58 | 27,90 | 29,23 | 27,79 | 30,24 |
| 8,51 | 8,26 | 8,61 | 8,77 | 8,62 | 8,09 | 8,43 | 8,06 | 8,78 |
| 19,85 | 19,18 | 20,11 | 20,42 | 19,89 | 18,57 | 19,43 | 18,76 | 20,55 |
| 6,84 | 6,53 | 6,90 | 7,02 | 6,87 | 6,54 | 6,95 | 6,39 | 6,99 |
| 0,80 | 0,79 | 0,80 | 0,80 | 0,79 | 0,81 | 0,82 | 0,79 | 0,79 |
| 0,62 | 0,62 | 0,62 | 0,63 | 0,63 | 0,64 | 0,64 | 0,63 | 0,61 |
| 39,7 | 41,3 | 39,9 | 38,7 | 39,8 | 36,7 | 34,4 | 40,2 | 40,9 |

SAMPLE 3:

Mean ball temp: 24°C

v_{ix}

v_{iy}

v_{fx}

v_{fy}

COR_T

COF

CPR

| 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) |
|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| 30,28 | 30,38 | 29,35 | 28,42 | 29,62 | 27,90 | 29,52 | 29,60 | 28,88 |
| 8,76 | 8,75 | 8,48 | 8,23 | 8,62 | 8,03 | 8,51 | 8,54 | 8,36 |
| 20,45 | 20,52 | 19,70 | 18,96 | 19,74 | 19,10 | 19,98 | 19,83 | 19,23 |
| 6,90 | 6,90 | 6,88 | 6,71 | 6,92 | 6,35 | 6,83 | 6,85 | 6,61 |
| 0,79 | 0,79 | 0,81 | 0,81 | 0,80 | 0,79 | 0,80 | 0,80 | 0,79 |
| 0,63 | 0,63 | 0,63 | 0,63 | 0,64 | 0,61 | 0,62 | 0,64 | 0,64 |
| 41,0 | 40,5 | 37,3 | 36,1 | 37,7 | 42,0 | 39,1 | 37,9 | 38,8 |

Test Summary - Court Pace : ITF CS/01/02-14-407

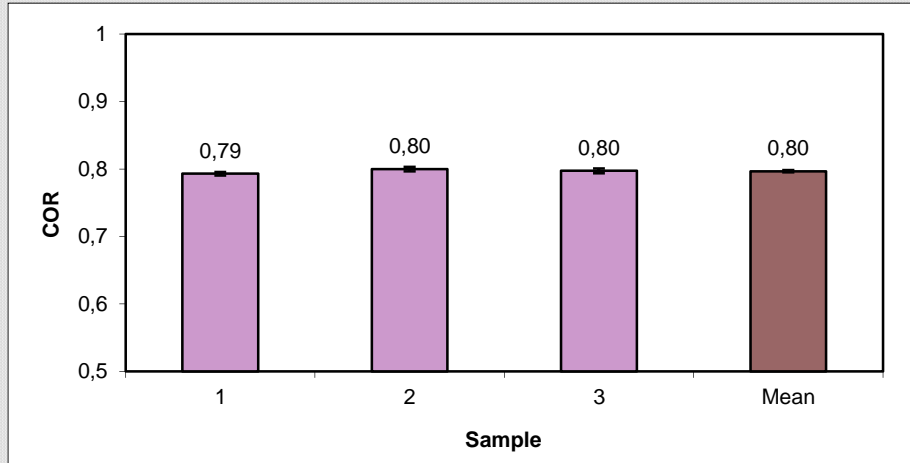
Surface name: RESITOP STANDARD
 Surface type: Acrylic

Ambient temp: 24°C

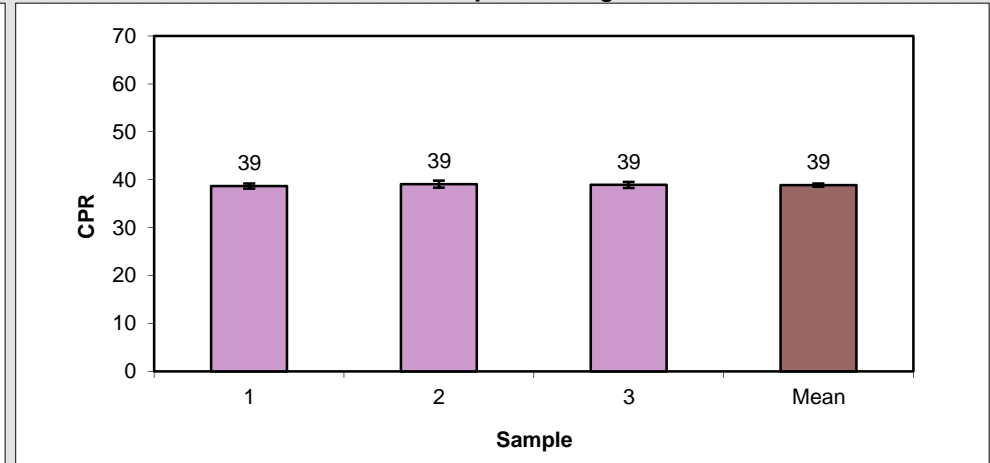
Humidity: 52%
 Surface temp: 24°C

Test laboratory: LABOSPORT
 Test date: May 28th, 2014

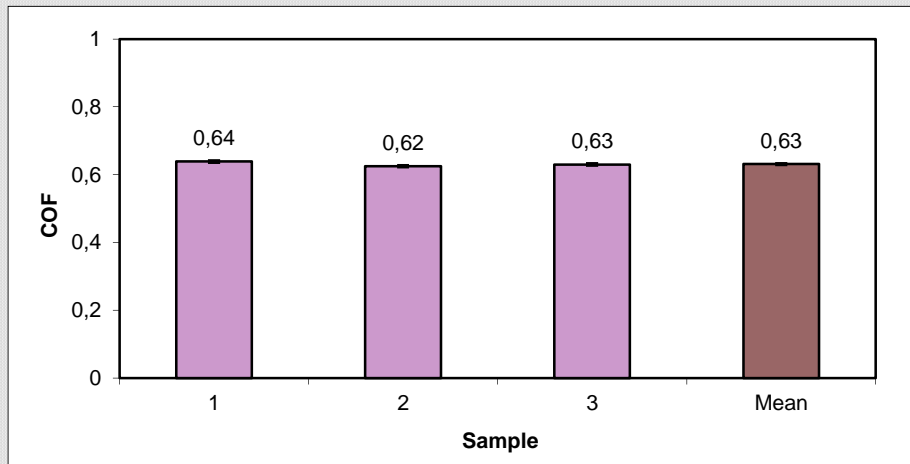
Coefficient of restitution



Court pace rating



Coefficient of friction



Summary

| | COR | COF | CPR |
|--------------|-------------|-------------|-----------|
| Mean | 0,80 | 0,63 | 39 |
| SE | 0,00 | 0,00 | 0 |
| Range | 0,01 | 0,01 | 0 |

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/01/02-14-407

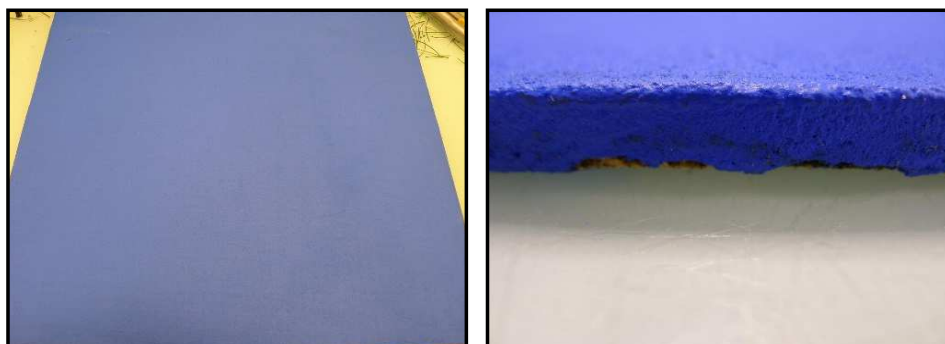
Surface name: RESITOP STANDARD

Surface type: Acrylic

Test laboratory: LABOSPORT

Test date: May 28th, 2014

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



Installation over new standard asphalt :

- 1 coat of Concentrado
- 2 coats of Premix
- 1 coat of Resurfacer Premix
- 1 coat of Topseal

Additional test information:

Test ball: ITF High-Specification ball 2014 (INA)

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 on a tennis court.

Labosport 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. 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 Court Pace characteristics of the product. In Labosport's opinion the product satisfies the technical criteria required for tennis court surfaces wishing to appear in the ITF's Court Surface Classification Scheme.

Labosport recommends, subject to ITF approval, that "**RESITOP STANDARD**" is included on the list of classified surfaces.