

**Test code:** 01/02-18-L-MPA-139-A

**Test location:** Lab

**Surface name:** Conipur Pro Clay

**Surface type:** Clay

**Test laboratory:** MPA  
Universitat Stuttgart  
Unit 51160: "Sports facilities, tracks"  
Stuttgart, 70569  
Germany

**Client:** CONICA AG  
Industriestrasse 26  
Schaffhausen, CH 8207  
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**Prepared by:** .....  
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**Distribution:** Copy 1 - MPA  
Copy 2 - CONICA AG  
Copy 3 - ITF

**Test date:** 11 June 2018

**Issue date:** 9 July 2018

**Coefficient of restitution (COR):** 0.84 Medium

**Coefficient of friction (COF):** 0.73 High

**Court pace rating (CPR):** 22 Slow

**Alternative category \***

**Final classification** Slow

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

Surface name: Conipur Pro Clay  
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Ambient temp: 22°C

Humidity: 55%  
Surface temp: 23°C

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## Test protocol:

- For tests in the laboratory, the ITF Accredited laboratory requires either three samples of minimum dimensions 0.5 x 0.5 m, or (in the case of infilled and carpet surfaces) one sample measuring 1 x 1 m. In addition, a reference sample shall be sent to the ITF Technical Centre.
- Test specimens should be flat. The body requesting the test should advise the laboratory on the preparation and storage of samples.
- 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.
- The test specimens shall be conditioned at 23 ± 2°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.
- The laboratory shall use three high-specification balls to test the surface. The balls should be stored in their cans at 23 ± 2°C and pre-compressed before use.
- The test balls shall be fired at an incident angle of 16 ± 2° and speed of 30 ± 2 m/s onto the surface, and the ball velocity shall be recorded before and after the impact.
- 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.
- 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.
- The temperature of the tests balls, surface and ambient conditions shall be monitored during the test, along with the relative humidity of the laboratory.
- On completion of the test, the ITF Accredited laboratory will submit the test result to the ITF and subsequently to the body requesting the test. On receipt of the result, the body requesting the test may apply to the ITF for inclusion on the ITF list of classified tennis court surfaces.
- If the mean CPR value for the three samples tested lies within two 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)

$\mu$  = coefficient of friction (COF)

$T$  = mean ball temperature for test sample (°C)

$c$  = temperature coefficient (0.003)

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

$eT$  = coefficient of restitution (COR)

$a$  = pace perception constant (150)

$b$  = mean COR for all surface types (0.81)

CPR = court pace rating

$$CPR = 100(1 - \mu) + a(b - eT)$$

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

## Terms and conditions:

- ITF Classification of a tennis court is valid for 3 years from the date of listing. If a company wishes a court to remain on the ITF Classified list, it shall arrange for the court to be reassessed by an ITF Accredited laboratory within 6 months prior to expiry.
- 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.
- 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 does not imply any form of ITF approval or endorsement.
- Only the ITF Court Pace Rating 'category' logo, as supplied to the applicant by the ITF, can be used in the marketing of the classified product.  
**Note: the ITF logo is a trademark of the ITF and cannot be used in any marketing or publicity materials (either printed or published on a website). Any unauthorised use of the ITF logo may result in legal proceedings against the Applicant and withdrawal of ITF Classification.**

# Test Results - Court Pace : 01/02-18-L-MPA-139-A

Surface name: Conipur Pro Clay  
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Humidity: 55%  
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Ambient temp: 22°C

## SAMPLE 1:

Mean ball temp: 25.0°C

	Shot 1	Shot 2	Shot 3	Shot 4	Shot 5	Shot 6	Shot 7	Shot 8	Shot 9
Vix	28.45	29.97	29.73	29.71	29.80	29.22	30.28	28.84	30.33
Viy	8.29	8.67	8.53	8.50	8.57	8.42	8.74	8.38	8.74
Vfx	17.11	17.79	18.38	18.38	17.83	17.87	18.67	17.25	18.61
Vfy	6.99	7.36	7.28	7.31	7.17	7.00	7.55	7.13	7.21
CORT	0.84	0.84	0.85	0.85	0.83	0.83	0.86	0.84	0.82
COF	0.74	0.76	0.72	0.72	0.76	0.74	0.71	0.75	0.73
CPR	21.7	19.1	22.5	21.8	20.8	23.9	21.5	20.1	25.3

## SAMPLE 2:

Mean ball temp: 25.0°C

	Shot 1	Shot 2	Shot 3	Shot 4	Shot 5	Shot 6	Shot 7	Shot 8	Shot 9
Vix	29.54	30.49	30.41	30.36	30.00	28.59	30.50	28.85	27.50
Viy	8.58	8.80	8.77	8.76	8.69	8.28	8.82	8.41	7.99
Vfx	18.10	18.94	18.50	18.94	18.28	17.11	18.36	17.37	16.69
Vfy	7.23	7.23	7.42	7.33	7.22	7.08	7.36	7.31	6.78
CORT	0.84	0.82	0.84	0.83	0.82	0.85	0.83	0.86	0.84
COF	0.72	0.72	0.74	0.71	0.74	0.75	0.75	0.73	0.73
CPR	23.6	27.1	22.0	25.9	24.1	19.4	22.2	19.0	22.0

## SAMPLE 3:

Mean ball temp: 25.0°C

	Shot 1	Shot 2	Shot 3	Shot 4	Shot 5	Shot 6	Shot 7	Shot 8	Shot 9
Vix	29.30	29.46	29.39	29.94	28.22	27.85	29.95	29.52	29.83
Viy	8.48	8.54	8.52	8.70	8.16	8.01	8.60	8.54	8.61
Vfx	17.79	18.04	18.11	18.68	17.31	16.84	18.56	18.24	18.75
Vfy	7.26	7.17	7.39	7.23	7.09	6.80	7.46	7.35	7.19
CORT	0.85	0.83	0.86	0.82	0.86	0.84	0.86	0.85	0.83
COF	0.73	0.73	0.71	0.71	0.72	0.74	0.71	0.71	0.70
CPR	20.9	23.8	21.4	27.1	20.6	20.7	21.4	22.4	27.0

# Test Results - Court Pace : 01/02-18-L-MPA-139-A

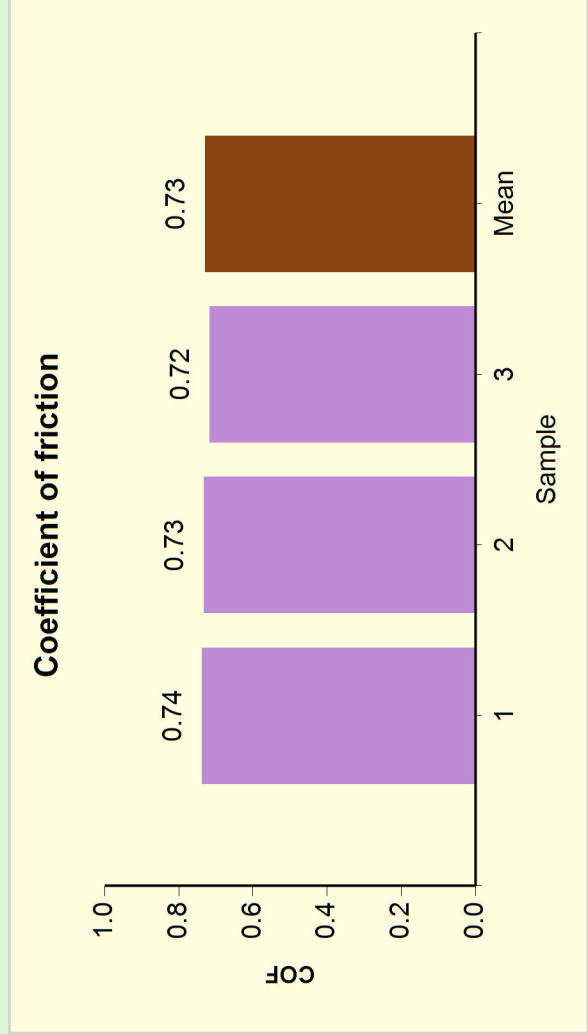
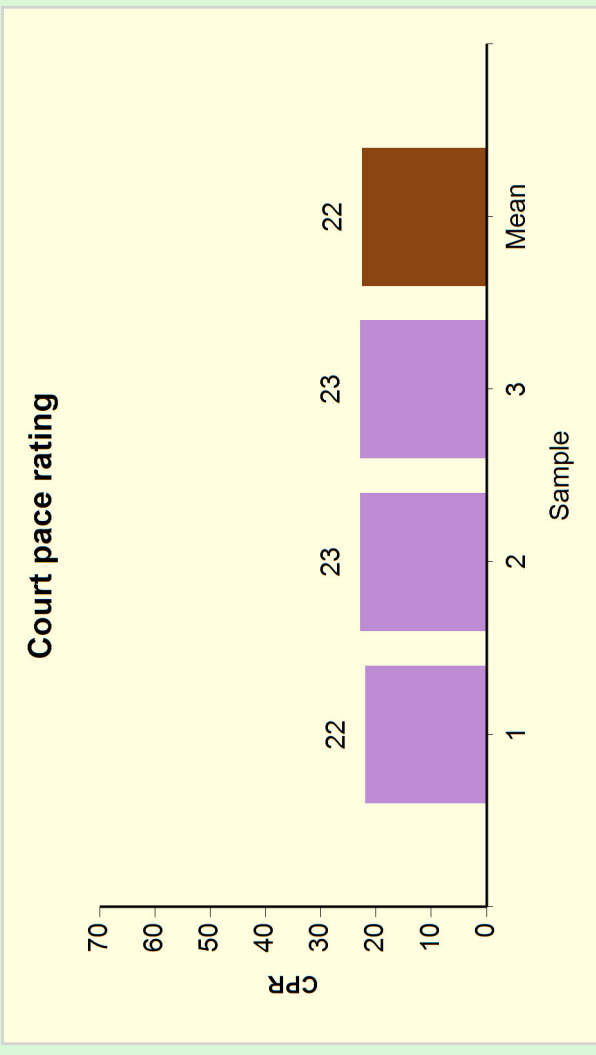
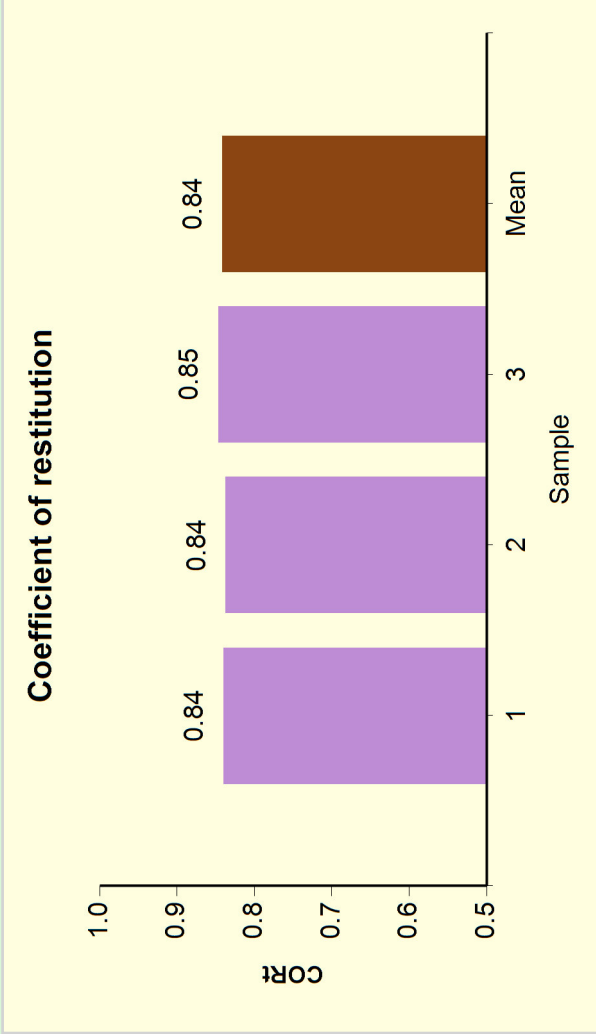


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### Summary

	COR	COF	CPR
Mean	0.84	0.73	22
SE	0.00	0.00	0
Range	0.01	0.02	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+)

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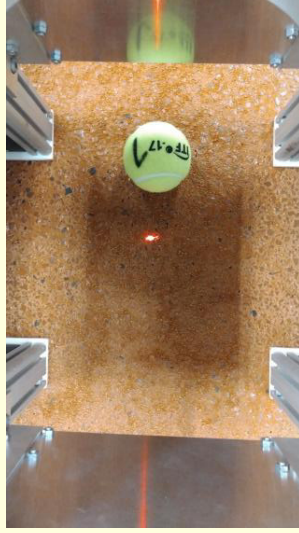
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**Full description of court surface - including manufacturer's reference, the type of supporting layers and their method of attachment:**



Layer 1 (base):	28 mm	Clay chippings with PUR binder
Layer 2:	Aggregate grading (mm): 2 mm	2.00000000000 - 8.00000000000 Clay sand
Layer 3:	Aggregate grading (mm): mm	0.00000000000 - 2.00000000000
Layer 4:	Aggregate grading (mm): mm	-
Layer 5:	Aggregate grading (mm): mm	-
Layer 6:	Aggregate grading (mm): mm	-
Layer 7:	Aggregate grading (mm): mm	-
Layer 8:	Aggregate grading (mm): mm	-
Line markings:	Aggregate grading (mm):	-
	White PVC markings	

## Laboratory comments:

A tennis court surface is defined as the top (playing) surface and any underlying layers of the construction that influence the sports performance (or biomechanical) response of a court. If any elements of the surface's construction change the response, performance and classification of the surface may be different.

For the test the base layer was laid on a concrete floor. The clay powder was broadcasted and levelled to a thickness of 1 mm using skirting boards. Finally to imitate the preparation on a court the surface was carefully swept with a brush.

## Laboratory recommendations:

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

## General information :

Use :	Indoor and outdoor	Stabilisation time (days):	7
Permeable :	Yes	Installation time (days):	2

## Additional test information :

Test ball : ITF High Specification 2017 (THA)