The **I**nternational **T**able **T**ennis **F**ederation

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TO: Members of the ITTF Board of Directors

COPY: Chairpersons of committees and working groups

SUBJECT: BoD agenda item 11: Updates of technical leaflets

Dear Colleagues,

As part of the process requested by the Executive Committee, we have been working to review the existing technical leaflets. As a result, we are able to present to you the following technical leaflets for *approval* at the meeting to be held on 12 May 2011:

1. Technical leaflet 3: balls (please note that the updated proposal 22 has not been included)
2. Technical leaflet 4: racket coverings
3. Technical leaflet 9: racket control function (please note that this was approved in principle in May 2010 and that proposal 23 has not been included)
4. Technical leaflet 13: anti-doping (a proposal to amend the provisions relating to the registered testing pool as T13 has been approved by the BoD previously)

The Board of Directors will also be asked to approve the *deletion* of the following technical leaflets as they have been incorporated into other documents:

- Technical leaflet 5: clothing
- Technical leaflet 8: world championships draw
- Technical leaflet 10: eligibility Olympic Games
- Technical leaflet 11: administration at the World Championships
- Technical leaflet 12: group competition
- Technical leaflet 14: score
- Technical leaflet 15: facilities world title
- Technical leaflet 16: flooring (re-numbered T6)
- Leaflet 1: ITTF administration at World Championships

For 2012, the Board of Directors will be able to consider the updated technical leaflets:

- Technical leaflet 1: table
- Technical leaflet 2: net
- Technical leaflet 6: sports floors (previously criteria for architects)
- Technical leaflet 17: lighting and airflow

Should you have any questions, please contact myself at any time.

Yours faithfully,

Jordi SERRA
Executive Director
(Operations and Olympic Games)

The International Table Tennis Federation

The Ball (version for 40mm balls)

Technical Leaflet T3

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Introduction

This leaflet describes, for the benefit of manufacturers, the tests which are applied to table tennis balls by the ITTF, and gives details of the criteria used in granting or withholding approval (chapters A - D). All ball brands approved have to meet all appearance standards and all qualitative and quantitative criteria described in the following sections. The procedure for ITTF approval is described in Technical Leaflet T7.

Laws

The Laws of Table Tennis relating to the ball are as follows:

2.03 The Ball
2.03.01 The ball shall be spherical with a diameter of 40mm
2.03.02 The ball shall weigh 2.7g.
2.03.03 The ball shall be made of celluloid or similar plastics material and shall be white or orange, and matt.

International Regulations

Regulations for International Competitions require equipment authorized or approved by the ITTF. .

Approval of Ball Brands

A manufacturer may have approved ball brands differing in:

- colour, i.e. white and orange
- material, i.e. celluloid and a different plastic
- brand name

Material

Notwithstanding the instability and flammability of celluloid, it has always been the standard material for a table tennis ball. The Laws do not prescribe the material, leaving manufacturers free to experiment. We need a better material, and manufacturers are encouraged to search for one. Experience suggests, unfortunately, that the search will be a very difficult one.

The ITTF Equipment Committee will support balls with a playing performance similar or identical to that of celluloid balls. We are aware that some of the specifications given in this Technical Leaflet can be met only with difficulty by non-celluloid balls. The Committee is prepared to accept a compromise which makes an approval possible if the playing characteristics are similar or identical to those of currently approved balls. **However, the ball shall have good and stable properties, which must not change at typical use before, during and after play, except a regular ageing, which should be kept at a minimum. E.g.: Permanent indentations or stress whitening as well as a flimsy or battered appearance must be clearly avoided.**

A. Qualitative Criteria and Appearance

A.1 General Appearance

The ball shall be white or orange, and matt (see B. 12). Balls differing in colour may have the same trademark, but shall be otherwise identical in appearance.

A.2 Seam

A ball must appear to be uniform. We accept that it is generally impossible to disguise the seam, but there must appear to be only one seam. After the two halves of the ball have been jointed in manufacturing, the ball may be subsequently moulded. If the equator of the ball - i.e. the joint - is not coplanar with the line of separation of the two halves of the mould, another line will be formed, looking like a second seam. This is not acceptable.

A.3 Stamp

The stamp on a ball may cover an area no greater than 280mm². It may be printed in one or two colours, but the same colour or combination must be used for all balls of the same brand. The wording used in the stamp has to be in compliance with ITTF regulations (see chapter "C. Marking"

A.4 Packaging

The balls must be packaged appropriately, e.g. in paper or plastic boxes or in a blister pack. The wording used on this package has to contain "40" or "40mm" in order to clearly distinguish the 40mm balls from the 38mm balls. Any packing of the balls, even those for big quantities, must contain a date or a date code and must be in compliance with the ITTF regulations (see chapter "C. Marking").

B. Quantitative Criteria

Tests are conducted on groups of 24 balls; the number normally purchased is one package more than is needed to provide this number (i.e. usually 30 balls). Statistical "outliers" are ignored when calculating means and standard deviations, but all values within a normal distribution but outside the permitted limits are included.

Note: „Conformity" means compliance with a specification set down in the Laws of Table Tennis or Regulations for International Competitions, and „regularity" means degree of uniformity within a sample.

Anyone wishing to know how we analyse test results statistically is invited to contact Dr. Joachim Kuhn / GER who is the member of the Equipment Committee in charge of ball testing, or the ITTF Headquarters in Lausanne /CH.

Test Procedures

The ITTF equilibrates balls at 23^0 Celsius, 50% R.H. for at least three days (standard conditions). They are then tested as follows:

Weight is measured on an electronic analytical balance reading to 0.001g, and the results are rounded to the nearest 0.01g.

Diameter We use a calibrated electrical device with an accuracy of at least 0.001mm which measures the diameter with a precision of 0.01mm.The ball is slightly pressed by a vertical pin (diameter 10mm). For fixation the ball is supported by an annular ring whose upper inside

surface slopes at an angle of 45 degrees. The outer diameter of the ring is 40mm and the inner diameter at the bottom of this slope is 20mm. In this position the ball is placed between two lateral, horizontal flat measuring pins (diameter 6mm) which automatically adapt to the ball diameter by springs. The diameter of the ball is monitored while turning the ball with a mechanical device about the polar axis (1), an axis crossing the equator twice and comprising the center (2), and about further two arbitrary axes comprising the center of the ball (3,4). By (1) the seam line is monitored, by (2) a line including both poles and by (3) and (4) arbitrary lines on the balls surface. By rotating the ball in said directions the minimum and maximum diameters are determined. The difference between the two values gives the lack of sphericity.

Alternatively, the following procedure can be applied:
The ball is placed arbitrarily between a flat and the measuring pin, and the diameter is observed. In order to guarantee that the measuring pin is vertically above the center of the ball we use two vertical flats with angle of 90^o against which the ball is horizontally pressed during the measurement. By rotating the ball in various directions the minimum and maximum diameters can then be determined. The difference between the two gives the lack of sphericity.

Bounce is measured by releasing the ball mechanically. After its bounce on a standard steel plate the ball is monitored with a digital camera with a calibrated mm scale in the background. The photos are evaluated. The geometric mean of three determinations then permits calculation of the maximum height of bounce.
Alternatively the rebound height can be measured by other methods, which give the same results.

Veer is a measure of the total sphericity of the ball, not merely its external aspect. It is measured by rolling the ball down a slight incline onto a horizontal surface, and measuring the distance by which it deviates from a straight line as it rolls across the surface. The incline is 100mm long at 14 degree to the horizontal; on a table that is 100cm long this gives a rolling time of about 3 seconds. Each ball is measured at least three times, rolling twice on the seam, and once about an arbitrary axis. A negative result is reported if the ball fails the test twice.

Hardness is measured on a fully automated and computerised Zwick tester (or equivalent). We use a preload of 0.5 N and testing starts 10 sec after preloading. A 20mm diameter pin presses against a pole of the ball with a 50 N force loaded at 10 mm/min, and the indentation is recorded with a precision of 0.01mm. The ball is supported by an annular ring whose upper inside surface slopes at an angle of 45 degrees. The outer diameter of the ring is 40mm and the inner diameter at the bottom of this slope is 20mm. Measurements are made on each pole and once on the seam; the average for the poles provides a measure of the hardness, and the difference between that and the seam indentation is a measure of the lack of symmetry.

Colour: The ball colour is measured and calculated according to the CIE Lab system, **giving three values ΔL, Δa and Δb (Δ = greek letter "delta" meaning "difference"). These values show the differences compared to the Munsell color standards given below for white an orange.** L indicates the black/white value on a scale from 0 to 100; a indicates the green/red value; and b the blue/yellow value, both on a scale from minus to plus 100. The measurements are performed on the seam and two other points on the surface. **If no seam is available three random points of measurement have to be taken.** 4 balls are selected from different boxes. The L, a and b values of the sample are determined by averaging over all 4 balls. **We use Spectrophotometer according to ISO 7724 (D65/10° incl. gloss) with a black velvet hemisphere behind the ball as background for the measurement. Supplier of Munsell Standards: X-Rite Inc., 4300 44th Street S.E., Grand Rapids, Mi 49512 U.S.A.**

Specifications

For the calculation of the following values two digits are taken into account.

B.1 Weight Conformity

Law 2.3.2 specifies 2.7g, but any weight between 2.67 and 2.77g is acceptable for any one ball. No more than 1 ball out of the 24 sampled may be outside this range. The sample mean must be between 2.69 and 2.76g. In carrying out statistical calculations we treat any weights less than 2.60g or greater than 2.85g as outliers.

B.2 Weight Regularity

The standard deviation may not exceed 0.03g.

B.3 Size Conformity

The minimum diameter of every ball must be at least 39.50mm, and its maximum diameter must not exceed 40.50mm. The sample mean average diameter, i.e. the mean of the average of the maximum and minimum diameters for each ball, must be in the range 39.60-40.40mm.
Values below 39.25mm or above 40.75mm are considered in our calculations as outliers.

B.4 Size Regularity

The standard deviation of the average diameter may not exceed 0.06mm.

B.5 Sphericity Conformity

The sphericity of any ball must be less than 0.35mm, and the sample mean sphericity must be less than 0.25mm. (The sphericity of a ball - more correctly the lack of sphericity - is the absolute difference between its minimum and maximum diameters.) In our calculations values greater than 0.50mm are treated as outliers.

B.6 Sphericity Regularity

The standard deviation of sphericity must be less than 0.06mm.

B.7 Bounce Conformity

All 24 balls must rebound to a height of not less than 240mm or more than 260mm when dropped from a height of 305mm on to a standard steel block.

B.8 Bounce Regularity *(to be examined)*

There is no specification for this property. Dynamic tests will be investigated.

B.9 Veer

No more than two balls shall deviate by more than 175mm from the center-line.

B.10 Hardness Conformity

The geometric mean pole hardness for any ball shall be in the range **0.68 – 0.81mm**.
The geometric mean pole hardness for the sample shall be in the range **0.69 – 0.81mm**
The mean seam hardness for the sample shall be in the range **0.72 – 0.83mm**
The within-ball (uniformity) coefficient of variation of the measurements on each pole and once on the seam shall be no greater than **0.17mm**.
The sample mean within-ball (uniformity) coefficient of variation shall be no greater than **0.08mm**.

B.11 Hardness Regularity

The coefficient of variation shall be not greater than 0.06mm.

B.12 Colour

The specifications for the L, a and b values according to the CIE Lab system are

for white balls: **Standard reference: Munsell notation: N9.5/ M**

$-6 \leq \Delta a \leq +5$

$-12 \leq \Delta b \leq +5$

$-21 \leq \Delta L$

for orange balls: **Standard reference: Munsell notation: 7,5YR 8/10M**

$-15 \leq \Delta a \leq +10$

$-15 \leq \Delta b$

$-10 \leq \Delta L$

All 4 balls tested have to meet these standards.

C. Marking

If the grade of the ball is indicated by a numbering system, no number higher than 3 may be used, e.g. „Three Star“.

C.1 The Stamp

The stamp on the ball must include the following four components:

- The ITTF Approval. This may be indicated by the initials ITTF or ITTFA, by "ITTF approved", or by the ITTF logo.
- the trademark or brand name
- the inscription “40” or “40mm”
- the name of the country where the company headquarters are registered, or the expression "made in ..." The same text must appear on all balls of an approved brand. I.e. it is not permissible to put one country name on some balls and a different one on others with the same brand name. Wrong claims will be penalized with a fine and can lead to immediate withdrawal of the ITTF approval.

No other text is permitted. The stamp may cover an area no greater than 280mm² described by a circle or a rectangle with a maximum side length of 25mm circumscribing all letters and symbols. It may be printed in one or two colours, but the same colour or combination must be used for all balls of one brand. All inscriptions must be easily readable. The trademark or brand name should be the most pronounced inscription.

C.2 Trademark or Brand Name

The Approval of the ITTF, the country or the expression “made in .....” are not considered to be part of the trademark or the brand name. The trademark or brand name must be unique and may not be used for another type of ball, especially not for an unapproved one. All balls with the same trademark or the same brand name must have an identical quality.

An ITTF approved ball may loose its approval if the supplier markets another non-ITTF-approved ball with the same or similar appearance as the ITTF approved one, with which it could be confused.

The ITTF will see as good as possible if the trademark or brand name will interfere with those of already existing ball brands. The ITTF is not responsible for any illegal use of registered trademarks. Verifying the correct and legal use of trademarks is not part of the ITTF approval procedure.

C.3 Packaging

The packaging must have the same information as is on the stamp and may also have additional information such as technical data or national approvals. The wording used on the packing may not contain false claims.

C.4 Date Code

The packaging, but not the ball itself, must be marked with a date or a date code corresponding to the date of production (month / year)**.** The date code must be readable without the need to destroy the packing. As long as the supplier uses his own datecode system the supplier must inform the ITTF Equipment Committee about the date code used and its decoding. From January 2004 on a uniform datecode system will be used.

The datecode consists of 4 characters: the first 2 for the month and the last 2 for the year. Month and year are encoded using the capital letters from A to I for the numbers 1 to 9 (A = 1; B = 2;……I = 9; X = 0).

Examples: a) ABXC means 1203, which is decoded as December 2003.
b) XEAA means 0511, which is decoded as May 2011

This datecode system will be mandatory for all ITTF approved ball brands produced from 2004 onward.

Manufacturers are strongly encouraged to clarify the design of the stamp, the packaging and the datecode before production with the ITTF Equipment Committee.

A missing datecode is penalized with a fine (see T7)

D. Administrative Items

D.1 Changes

Any change of the trademark or the brand name, the date code, the stamp, the packaging, the ball quality, the source of supply and any other changes relevant for ITTF approval must be notified to the ITTF Equipment Committee. If the stamp or box design is changed two boxes must be sent to the ITTF Headquarters in Lausanne / CH. The changes must be confirmed by the ITTF **in writing**.

The failure to announce changes to the ITTF will be penalized with a fine (see T7) **or can even lead in severe or repeated cases of failure to an end of the ITTF approval.**

D.2 Publication

A list of all ITTF approved ball brands is published in the Internet, the ITTF handbook and the ITTF Bulletin. The approval list is published in alphabetical order by trademark or brand name.

D.3 Approval Code

The ITTF uses an approval code consisting of

- a serial number according to the date of application for ITTF approval and
- the month and year of application for approval.

Example: ITTF-21–B-06/00; meaning: 21st ITTF approved ball (B), approved in June 2000.
The manufacturer is free to use the approval code in his advertisements.

The International Table Tennis Federation

Racket Coverings

Technical Leaflet T4

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Introduction

Most table tennis equipment is provided by club or competition organisers, and over the years it has remained fundamentally unchanged. Although the racket is the choice of the player himself, it too remained unchanged during the ITTF's first decades. But it then appeared that a modification in the characteristics of the racket could mean the difference between victory and defeat. The subsequent decades have accordingly seen continual development, some of it not salutary.

In order to ensure that any future changes are to the benefit and not the detriment of the sport, a system of ITTF authorisation of racket coverings has been introduced, and important changes have been made to the Laws of Table Tennis and the Regulations for International Competitions.

This leaflet sets out the current Laws and Regulations, defines some of the terms used and lists some additional criteria for ITTF authorisation of racket coverings and thereafter entering the List of Authorised Racket Coverings (LARC).

Laws

The racket must comply with paragraphs 2.4. and 3.2.1.3 in the ITTF Handbook, under the *The Laws of Table Tennis* and the *Regulations for International Competitions*, respectively.

Definitions

"4.0 mm" maximum thickness of sandwich rubber (The Law 2.4.3), and *"2.0 mm"* maximum thickness of pimpled rubber (The Law 2.4.3 and 2.4.3.2) will be interpreted statistically to mean 4.0 and 2.0 mm respectively; implying that these limits are absolute values, and on no part of the playing surface on a racket covering should these measurements be extended. These thicknesses refer to the total of the racket covering including any reinforcement in the rubber (for instance textile) and any glue / adhesive used to attach it to the blade.

"Supplier" and *"Brand"* (The Law 3.2.1.3) refers to the supplier name and brand name, respectively, as they appear in the rubber mould and the LARC.

"Bright red" (The Law 2.4.6) is defined on the Munsell system by three co-ordinates:

Hue:	4.0 - 6.5 R
Value:	min. 3.1
Chroma:	min. 7.5

measured on a white background; ref. Konica no.1864-721 (CM-A101W).

"Cellular rubber" (The Law 2.4.3.2) is also known as sponge.

"Continuity" (The Law 2.4.5) implies that each layer shall be continuous; for instance, a blade consisting of one type of plywood in the centre and another type at the edge would not be considered to be continuous. It is accepted that the veneers of plywood are normally made by edge-gluing pieces together to make a continuous sheet; the resulting joints may appear in the blade, but joints in more than one direction are not permitted, and neither are joints that extend from one face through to the other.

"ITTF logo" (The Law 3.2.1.3) is to be used on all authorised racket coverings, and within a frame for new and changed racket coverings. Ref. C. and D.4. below.

"ITTF number" (The Law 3.2.1.3) is the unique identification for new racket coverings.

"List" (The Law 3.2.1.3) is the List of Authorised Racket Coverings (LARC). It has a validity period specified in the header.

"Matt" (The Law 2.4.6) implies that the rubber will be considered to be unacceptable if the gloss of "pimples-in" rubber or of either the base of "pimples- out" rubber or the tops of the pimples are so high as to permit the shape of a light-source to be distinguished in its reflection. See B.1.4.

"Natural wood" (The Law 2.4.2) implies continuity throughout the blade; this permits plywood but not, for example, particle-board, flake-board and other composites.

"Racket covering" refers to the rubber, with or without a sponge under, used to strike a ball.

"Rigid" (The Law 2.4.1) is intended to apply to the blade and the handle taken as a whole. Flexibility is not permitted in a racket except in the racket covering.

"Rubber" (The Law 2.4.3.1 and 2.4.3.2) implies any material that can be stretched at room temperature to twice its original length, and that, after being held in the stretched state for one minute, retracts within one further minute to less than 1.5 times its original length.

"Top sheet" refers to the sheet of pimpled rubber when used over a sheet of sponge.

A. Qualitative Criteria

1. General Appearance

The racket consists of blade, adhesive, and racket covering(s) with or without sponge.

1.1. Blade

A very thin layer of lacquer is permitted on the blade, only for the purpose of anchoring wood fibers, thereby facilitating replacement of the racket covering. Anything more than this will be deemed to constitute a layer of plastic, and will not be permitted. This layer may be no more than 0.1 mm thick, and should not hide the wood from sight or touch. It is considered to be part of the blade, rather than part of the thickness of the racket covering.

1.2. Adhesive

The use of a thick layer of adhesive is NOT permitted either within the blade (The Law 2.4.2), or between the blade and the racket covering.

The manufacturers should be aware that the practice of "re-gluing", i.e. removing the racket covering, adding adhesive and re-applying the racket covering immediately before a match, might cause rubber / sponge to expand. When the resulting thickness is measured by an umpire it may be found to be illegal.

1.2.1. Solvents

To remove volatile solvents which the manufacturers utilise during their processes they should expose rackets or sandwich-rubber combinations to air before packing them, and players should similarly air their rackets - for up to 72 hours - that could contain some of the solvents left over from the production process or their own gluing. Refer to our Technical Leaflet T9 for Racket Control, to be applied at ITTF events.

1.2.2. PSA (Pressure-Sensitive Adhesive sheets)

Apart from adhesives, a PSA may be used for fixing the rubber to the blade. Some of these are water-based systems.

PSA may not be more than 0.1 mm thick and may not be cellular. It may consist of two layers of adhesive supported on the two sides of a plastic film or a cellulosic paper, or may be one solid layer of film. The packaging should carry the trade name and instructions for use.

1.3. Sponge

The use of sponge (i.e. cellular rubber) is governed by The Law 2.4.3.

Translucent red racket coverings may not be used over dark sponges or dark blades, and translucent black ones may not be used over light sponges or light blades.

1.4. The racket covering

The rubber surface of the racket coverings should be uniform and without coating.

In addition to the requirements of The Law 2.4.3.1:

1.4.1. Pimples

All pimples should be equal. Each pimple must have a circular symmetry, with its axis perpendicular to the plane of the base layer. At any height above the base it shall be no wider than at any point closer to the base. This permits cylinders, cones (but not inverted cones) and combinations thereof.

Pimples must be evenly spaced along three sets of parallel lines at 60 degrees to each other.

The surface of the pimple top must be parallel to the base of the sheet, but may be smooth or roughened (up to 0.1 mm), though not to an extent that would constitute hollowness in the pimple.

For pimples-in racket coverings some deviation from an ideal shape is acceptable, like irregularities on the side of the pimple, or a “hat shape” on the pimple tops – when this is not a general trend, but is found on individual pimples. For the pimples-out racket covering, deviation from an ideal shape is not acceptable.

1.4.2 Ordinary pimpled rubber

"Ordinary pimpled rubber" may carry pimples on one side only; the other side must be smooth, although it may be bonded to a thin layer of fabric,

which should not be visible on the playing side and should not add to the total thickness.

1.4.3. Sandwich rubber

More than one layer of cellular rubber (sponge) is not permitted, even if the layers are of the same composition.

However, if the top sheet is translucent, then the layer underneath must be uniformly coloured; it is not permitted for a manufacturer's logo on the lower layer, or on the blade, to show through.

B. Quantitative Criteria

1. The racket covering

It should be noted in particular that:

Authorisation is given to the top sheet plus the top sheet / sponge combination. Red and black top sheets with the same supplier and brand name must have the same geometry, properties, and text (wording and numbering). The surface colours must be uniform. Red and black top sheets of the same brand do not require separate authorisation fees.

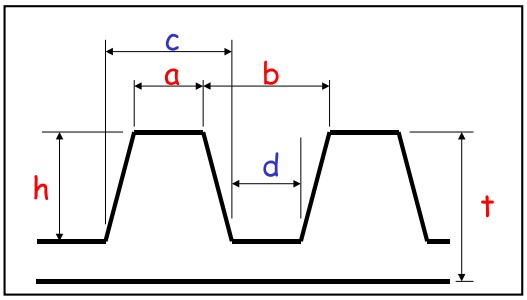
1.1. Pimple dimensions

In LARC the racket coverings are categorised in four types:

In = pimples-in (determined by the text in the mould),
Anti = pimples-in (this term may be applied on supplier demand),

Out = pimples-out (determined by the text in the mould),
Long = pimples-out (when the aspect ratio – see below - is > 0.89).

Covering type	Pimple diameter on top = A	Distance between pimple tops = B	Pimple height = H
In and Anti	min. 1.0 mm	min. 0.5 mm	min. 0.5 mm
Out and Long	1.0 – 2.2 mm	1.0 - 2.0 mm	min. 1.0 mm



Dimensions “c” and “d” are indicated here, since they may be reported in the Form which accompanies applications for new racket coverings.

1.2. Rubber thickness T = max. 2.0 mm

1.3. Aspect ratio

I.e. pimple height / pimple diameter, shall not be > 1.10.

1.4. Gloss (shininess)

An acceptable surface is one whose gloss, measured with an EEL gloss meter at 45^{o} head setting, is not > 6%; corresponding measurements of 60^{o} specular gloss using ASTM procedure D523 must give values not > 24%.

1.5. Friction for pimples - out

The minimum friction level is 25 mN (Milli Newton).

1.6. VOC (Volatile Organic Compounds) testing.

This test is performed with the maximum limits according to the latest decision by the Executive Committee.

1.7. Player’s responsibilities

It is the player’s responsibility to limit the total thickness of his racket covering to no more than 4.0 mm, including top sheet, sponge and adhesive. Without sponge, not more than 2.0 mm.

It is also his responsibility to ensure that a red top sheet does not become too dark when affixed to the sponge, or a black top sheet becoming too light.

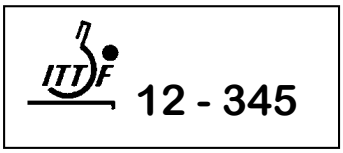
C. Rubber identification

The ITTF number or the combination of supplier name / brand name is the identification of the racket covering. Hence it must be unique and should not create confusion in relation with other racket coverings. It will found in the rubber mould as well as in the LARC.

New racket coverings submitted for authorisation, and existing rubbers that undergo changes in text design, must have the ITTF logo, an ITTF number, and a supplier and a brand name in the rubber mould.

- The ITTF logo should be min. 10 x 10 mm.
- The ITTF number should be adjacent to the ITTF logo, (over, under, or on one side), consisting of 5 or 6 digits with:
- A. 2 or 3 first digits being the supplier number - to be supplied by ITTF - followed by a dash.
- B. 3 next digits being a brand number, usually starting with 001 and in regular succession, normally without gaps - controlled by the supplier.
- All digits on same line, min. 5 mm height, font Arial normal.
- Letter height min. 0.2 mm above rubber base.
- The ITTF logo and ITTF number should be enclosed by a single frame of any shape, with nothing else inside.

Example:



SUPER SUPPLIER

MEGA BRAND

In addition a racket covering may carry the name of a country or that of the Association in that territory, or both.

All letters, logos, ornaments, etc. should all be placed in the text area i.e. extending max. 25 mm into the playing surface and positioned towards the same edge of the top sheet.

It is possible to have two pictures of the text area at any time for one brand on the ITTF web site.

The Equipment Committee will give advice on the layout of any text area when submitted.

The supplier and brand names and the frame - with the ITTF logo and ITTF number (when applied) - must be visible on the racket covering when it is mounted on the blade (The Law 3.2.1.2).

When an ITTF number is withdrawn, it cannot be used again for 10 years.

D. Administrative Procedure

1. Submitting racket coverings for testing

New suppliers interested to be included in ITTF's LARC, should first contact the ITTF Equipment Coordinator or the person in charge for racket coverings, at the address given on the ITTF web site:

www.ittf.com / Home Page / Main Page / Equipment / Racket Covering / Contact person

A new supplier will be provided with an ITTF number and, if required, be explained step by step the procedures to follow for having a racket covering authorised and included in LARC, ref. below.

Racket coverings, to be tested, should NOT be sent to the ITTF Headquarters or other ITTF addresses, but to the address given on the ITTF web site of the person in charge of racket cover authorisation procedures, after contacting this person, for example by e-mail.

The supplier should - in summary (more details below):

1. Submit samples.
2. Submit the descriptive form.
3. Submit an image file of the text area.
4. Pay the appropriate testing fee to ITTF.

As soon as the results from the laboratories are available, and after reception of the payment for the test, the results will be given to the supplier.

The received samples will be stored for future reference.

If there exists a special version for sale without sponge and equipped with a reinforcement (for instance of textile), this / these should also be submitted (these are sometimes named OX).

The use of another table tennis supplier name as part of a brand name requires a written statement from the supplier in question to be submitted to ITTF when applying for authorisation.

Any supplier / manufacturer wishing to have racket coverings measured may send them to the Equipment Committee as given above, with the testing fee to be paid when invoiced.

2. The detailed procedure of obtaining authorisation

A racket covering which is included in the LARC is considered having an authorisation for the period in given in the header.

2.1 General

The time the entire procedure may take is uncertain. A laboratory normally can use about 6 – 8 weeks; in addition the time for transport, Customs and administration, is normally covered by approximately 2 weeks. However, under special circumstances it may take longer. In general, the procedure runs smoothly, but the ITTF declines all responsibility if there are delays and other unforeseen complications.

The racket coverings that have been tested and found acceptable 2 weeks before the publishing of the LARC (see 2.2, Para. 9 below) - using either the Normal or the Simplified method - will be included.

The samples that are submitted to the ITTF for testing are taken to be representative for the normal production, and our decisions are based on that.

Any supplier / manufacturer wishing to have racket coverings tested may send them to the Equipment Committee as given below, with the testing fee to be paid when invoiced.

2.2 Normal procedure

1. The supplier should submit the following:

   one top sheet sample of each colour- with no sponge,
   one complete racket covering – any colour - with the thickest sponge to be marketed; packed as it will appear in the market (for VOC test, ref. C.10),
   one extra sample for pimples-out (to save time, ref. Para. 11 below) any colour, with no sponge,

   to the address given under “Contact Person” on ITTF web site.
   Please ensure that all charges are paid before shipment.

2. Include a Form duly filled for each supplier / brand combination. This Form and the instructions for this are available on our website.

3. Include an image file (preferably in .jpg format) showing the text area for each supplier / brand combination - for the ITTF web site. A black & white version is recommended.

4. Ship the samples, free of any charge and declared as “sample for inspection, no commercial value”. If a value must be stated, do not set it to more than $20, nor less than $1 on the paperwork which follows. If any additional costs must be paid, which is rare, the supplier will be charged.

5. After the samples have been received, unless other agreements, they will be sent to a laboratory for testing. The supplier will be informed and given a reference number.

6. A testing fee invoice carrying the reference number will be sent from the Lausanne headquarters to the supplier. Each new required test will generate a new fee invoice.

7. When the test results are available, the supplier will be informed about the result, provided the test fee has been paid.

8. If the racket covering is according to our Technical Leaflet T4 and therefore can be authorised, it will be included in the next issue of the LARC. A fee per year will be invoiced from our Lausanne office.

9. LARC is updated 1. October (valid from 1. January) and 1. April (valid from 1. July) only. New racket coverings are valid from the publishing date; see information in the LARC header.

10. When submitting racket coverings for repeated tests or the ten year re-test, paragraphs 2 and 3 above are not required.

11. For pimples-out only: Racket coverings will be subject to the special friction test which may take additional time and will be invoiced additionally. An extra sample may then reduce time. An authorisation is not valid before also this test is passed.

2.3 Simplified procedure

When time is short, this procedure may help.

A. Submit according to paragraphs 2 and 3 in the Normal procedure to the address given under “Contact Person” on ITTF web site.

B. Attach a message with a promise not to do any marketing of this brand before the racket covering has been authorised.

C. The brand will be included in the next LARC, and the fee will be invoiced.

D. A complete sample set equipped with text in the rubber mould should be submitted by the supplier within 4 months after the

printing of the LARC following paragraph 4 in the Normal procedure. If not, the brand will be omitted.

E. Paragraphs 5 – 7 and 11 in the Normal procedure to be followed.

2.4. Further remarks

Parcels with racket coverings arrive via ordinary mail, by delivery companies, or as registered letters to be collected at the post office. Sometimes the Customs Clearance withholds a parcel, asking for invoice or the content, and then also charging fees and value added tax. Such fees may be paid back if applied for, but taxes are not, so then a refund will be invoiced to the supplier.

If the suppliers submit parcels with "ITTF" - or the full name - in front of the address given, the Customs tends to treat the parcel in a - for the receiver - simpler and better way, thereby helping to avoid a delay.

However, time cannot be guaranteed in this process, so it is advisable to be early. Remember that all such incidents may require extra time. If time is essential, please consider the Simplified procedure.

All racket coverings received will be regarded and tested as new ones and any reference to other similar and previously authorised racket coverings is of limited interest.

The received samples will be stored for future reference.

3. The List of Authorised Racket Coverings (LARC)

LARC is issued only twice per year. The publication / printing is normally 1. April and 1. October. New racket coverings in LARC – marked as ***bold*** - are valid from that day. The other racket coverings are valid half a year from 1. July and 1. January, respectively.

The authorised racket coverings at any time are those in the valid version of the LARC, for the specified period, see header. The Internet version may be corrected for errors during the season. Information will be given on the ITTF web site. It is not permitted to use racket covering outside the valid periods given in the LARC.

It is recommended that new samples for testing should be submitted at least two months ahead of the publication date in order to be in time for the coming season's LARC. The ITTF may not be held responsible for any delays occurring at customs, during transport or in the laboratory.

There should be no marketing of new racket coverings before the authorisation has been published. If a racket covering is marketed before

the racket covering appears in LARC, the authorisation is void. However, the racket covering may appear in sales brochures etc. provided the validity date is clearly mentioned.

The LARC now omits all reference to sponge colours.

4. The use of ITTF logo

This logo is the property of the ITTF. Hence, the suppliers may use the ITTF logo only on equipment that is properly authorised, i.e. here only the racket covering itself. It is considered illegal to use the main ITTF logo in connection with an assembled product like an assembled racket etc. However, the ITTF has made some logos that may be utilised for assembled rackets.

See also "Guidelines for ITTF logo" at the ITTF web site, also under Equipment, or *http://www.tmsin.com*

5. Fees

There is a testing fee, which must be paid before the results of any actual tests are published. The testing fees are subject to changes year by year. The ITTF Equipment Coordinator may be contacted for information about testing fees. This is also the case for any extra tests made for suppliers and for the retesting of racket coverings after a period of ten years. If more frequent testing is considered necessary by the Equipment Committee, the supplier will have to pay the fee. The fees will be invoiced from the ITTF Headquarters in Lausanne.

An authorisation fee is paid for being included in the LARC (on the paper version and on Internet, including the image files). Lack of payment will mean withdrawal from the next LARC.

The authorisation fees are paid for LARC, which are published in April. In October only new racket coverings entering LARC for the first time are subject to the additional fee / racket covering.

When a new supplier is entering LARC in October for the first time, it is subject to the authorisation fee, half the amount for the first racket covering and full amount for each additional racket covering, according to the list of fees, and will be invoiced again in April next year.

If a racket covering is removed from the LARC for technical or financial reasons, there will be no refund.

If it is desired to re-authorise a known racket covering that has been removed from the LARC for whatever reason, it will be treated as a new brand with new test and authorisation fees.

6. Changes in racket coverings

The ITTF authorisation applies to a racket covering as originally submitted and tested; its subsequent alteration, by a supplier, a player or anyone else, is not permitted (The Law 2.4.7).

Changes from the original design will normally not be permitted. However, changes to the text area only may be allowed, and must be confirmed with samples and image files submitted.

7. Supplier's responsibilities

It is the responsibility of the suppliers to keep their brands on the LARC by paying the fees and maintaining the original properties of the racket covering as authorised, without alterations. In addition a Contract with ITTF must be adhered to.

8. Withdrawal of authorisation of racket coverings

It should be noted:

1. that the Equipment Committee has been instructed to deny authorisation to any racket covering that it deems detrimental to the sport,
2. that Board of Directors (BoD) has the right to withdraw the authorisation of any racket covering at any time, if it finds it detrimental to the sport (The Law 3.2.1.1),
3. that not paying the yearly fee or requested test fees will result in a deletion from the LARC and a notice on the ITTF web site if required.

Only red and black racket coverings are permitted in ITTF events and have the right to carry the ITTF logo. All other racket coverings of any other colour are illegal.

9. Re-testing of racket coverings

Racket coverings will be re-tested approximately every ten years after having been included on the LARC. The suppliers will be notified to submit samples, and there is no additional information required. The test fee will be invoiced from the ITTF Headquarters.

When comparing two rubbers of the same brand at different times – for instance when making the 10-year test - the sum of the pimple diameter on top (A) plus the distance between the pimple tops (B) must be the same within 20% for these to be accepted to be the same brand. If not, they will be considered to be different brands.

10. Extended testing of racket coverings.

ITTF's is making an effort to reduce the use of VOC (volatile organic components) due to the health risqué involved. This work is also fully supported by IOC and United Nations.

The Law 2.4.7. says "*The racket covering shall be used without any physical, chemical of other treatment.*" Our reference point here is the authorisation. However, there have been criticisms that ITTF does not authorise the complete racket covering, only the rubber itself (top sheet). Hence, to remove any doubts, we are enlarging the testing.

We are doing racket controls at ITTF events, and this testing will be increased. By collecting the information from these events we will be able to compare with data from this testing. We will start concentrating on VOC and thickness which have shown to be the most important areas here. These will then be our main reference points for comparison.

We are asking for one thing here: one complete racket covering (a complete racket covering of any colour) with the thickest available sponge of each brand on LARC, in a parcel as it is presented to the market – in a plastic bag or similar. This will be our reference sample for our testing of VOC and thickness.

End of T4

The **I**nternational **T**able **T**ennis **F**ederation

RACKET CONTROL
Technical Leaflet T9

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Effective 1 September 2010

Section 1: Introduction

This Technical Leaflet describes how the umpires and/or racket controllers may check and measure that a racket is legal and does not release volatile solvent vapours, except water.

During a world title competition or ITTF sanctioned event as well as during a regional or continental championship, the umpires and racket controllers check the rackets and report to the referee under whose jurisdiction racket control resides. Before the event starts, the tournament organisers provide and equip the necessary facilities, for use, at the latest, one day before the competition starts.

Section 2: The Laws of Table Tennis

Racket control is the procedure to test whether a racket complies with the Laws of Table Tennis, which can be found in the ITTF Handbook, Section 2.

Section 3: Regulations for International Competitions

The Regulations for International Competitions of Table Tennis relating to racket control can be found in the ITTF Handbook, Section 3.

Section 4: Racket Coverings

It is the responsibility of racket controllers and umpires to check whether the racket coverings of the players are authorised and included on the current List(s) of Authorised Racket Coverings (LARC), at the time of the racket control.

Section 5: Racket Control facilities and equipment

Racket control takes place in a facility with specific requirements, which are sent to the organizers in advance. Players are obliged to go to the Racket Control Centre, if they are

selected to have their racket tested. The Racket Control Centre is identified by several signs in the competition venue.

Racket Control will be established at all ITTF World Title and Olympic events, as well as at a select number of ITTF Pro Tour and Junior Circuit events and may be established at Continental and Regional competitions.

Section 6: The Racket Control panel

At events including the World Championships, Olympic or Paralympic Games, the ITTF Equipment Committee shall recommend up to 3 people as racket controllers, and one shall be appointed as Chief Racket Controller.

The referee is responsible for deciding the acceptability of playing equipment, including any allowable tolerances, and must advise the Chief Racket Controller prior to the start of competition. However any rackets that exceed the values listed in the Laws or Regulations must be referred to the referee for approval, even if they are within any agreed tolerance. The ITTF Executive Committee is responsible for setting the allowable level of harmful volatile substances.

The Chief Racket Controller:

- reports to the referee;
- agrees with the referee the confidential schedule and random choice of match-controls, written reports about racket failures and other activities;
- prepares and checks the documents and forms in advance for racket preparation and control to be distributed to the officials, players and umpires once approved by the referee;
- liaises with the organizer before the start of the tournament;
- inspects, as soon as possible after his/her arrival, the racket preparation and racket control areas and meets the referee and the tournament director to discuss arrangements;
- attends, if possible, the umpires' and the coaches' briefing and answers all relevant questions;
- actively tests and coordinates the work of the panel;
- plans the duty-roster of the members of the panel;
- is considered as a match official, and the results of his/her measurements are a matter of fact;
- watches that the tests are conducted with care and accuracy, and that the results are correctly recorded, kept confidential, and are submitted only to the referee;
- submits, after the tournament, a report to the ITTF Equipment Committee (number of the tests, failures and their reasons, reports to the referee, other problems). Statistics about the test results may be published.

The detailed inspection of the racket remains the duty of the umpires, who may ask the referee for a racket control, before the match starts, if they consider a racket may be illegal.

The racket control panel may detect manufacturing imperfections or illegalities (such as pimple geometry) that are not included in the Laws or International Regulations but are against the specifications of the Technical Leaflet; these items are not referred to the referee but to the ITTF Equipment Committee.

Section 7: Practical organisation of Racket Control

Every day, the Chief Racket Controller does the draw and schedule for racket controls for the next day, and reports to the referee and the competition manager of the competition. The referee must endorse the schedule and may, at any time, change this schedule by adding or removing matches to be checked.

Section 8: Voluntary and compulsory racket control and racket inspections

Before the tournament the referee or nominee will inform all delegations and officials, including umpires, the details of the racket control procedure. This information includes voluntary and compulsory controls, procedure for the tests, the necessity to air new rubbers correctly, the location of the racket preparation area and the racket control centre, sanctions encountered in case of a racket failure, and procedures for appeal at World Championships, Olympic and Paralympic Games.

Voluntary racket control

- Voluntary control is available on the day before the tournament, as well as during the tournament, without interupting the compulsory racket controls. Players can ask the Chief Racket Controller, when there is free time so they can have a voluntary control;
- Each player may bring only two rackets for one test each or have the same racket tested twice at one tournamnent;
- The rackets submitted will be examined carefully;
- All measurements or observations during a voluntary test will be recorded in the normal “Racket Test Report” form;
- All defaults identified will be recorded on a special form, which must be signed by the player as a record that the player was informed about the irregularity found (the specific test failed without an indication of the actual measurement), and which will be submitted to the referee for action if necessary;
- The member of the racket control team will then encourage the player to seek the referee’s advice about the consequences of a failed test, prior to compulsory testing;
- No disciplinary action will be taken against a player whose racket fails in a voluntary test. If requested, the forms for voluntary testing are handed to the jury; otherwise they remain confidential.

Compulsory racket control

Racket control is compulsory during the tournament and may include before-match and after-match examination of the authorization and the playing properties of the racket, as well as tests of the prohibited solvents, which will be carried out according to the regulations, and also other tests which may be found useful.

A. Racket Control tests will be carried out **after-match** at random. In the case where rackets do not pass a random Racket Control after-match test, the offending player will be **liable to penalties** as implemented at the 2010 World Championships (refer below).

B. However, from the quarter-finals on, Racket Control tests will be **before-match** for selected matches of individual events and randomly selected individual matches in team matches. Rackets that do not pass the Racket Control tests before the match cannot be used in the above-mentioned events.

Team events – before-match

- In team events, a member of the racket control panel will inform the captains during the draw for the selection of letters and sequence of play;
- The players who have to play the first individual match must submit their rackets to the racket contol centre at least 20 minutes before the scheduled match time;
- The players who have to play the second individual match must submit their rackets to the racket control room before the previous individual match starts. The same procedure should be followed for subsequent individual matches;
- The rackets tested will be given directly by the racket controller to the match umpires, who will give them back to players in paper bags, keeping the rackets separate when they come into the playing area;
- If it is necessary for a player to change their racket during play due to it being accidentally damaged, the umpires must collect the replacement racket used, which will then be subject to an after-match test;
- If a player brings the racket late, his/her racket will be tested after the match.

Team events – after-match

- For an after-match test, the match umpires will be informed in advance, and they must collect the rackets of both players or pairs, immediately when the match finishes. Rackets will be submitted to the racket control panel for testing and players may collect their rackets at the racket control centre ten minutes later.

Individual events

- For a **before-match** test, players will be informed in advance, and they have to submit their rackets to the racket control centre at least 20 minutes before the scheduled match time;
- When the rackets for a match have been tested, they should be kept separately in paper bags. They are then given to the match umpires, who will give them back to players when they come into the playing area to start the match;
- If it is necessary for a player to change his/her racket during play due to it being accidentally damaged, the umpires must collect the replacement used, which will then be subject to an after-match test;
- If a player brings the racket late, his/her racket will be tested after the match;
- For an **after-match** test, the match umpires will be informed in advance, and they must collect the rackets of both players or pairs immediately when the match finishes. Rackets will be submitted to the racket control panel for testing and players may collect their rackets at the racket control centre later.

When collecting rackets, racket controllers or umpires must cautiously take the rackets by the handle, add a note with the name of the player, and take them in separate paper bags to the racket control centre.

If the player has covered the side of the blade and the sponge with trimming, the controller may carefully remove half of the trimming, if necessary for him/her to perform the tests, while remembering that he/she will have to attach it correctly afterwards.

All data about the racket covers are recorded on the racket control report form.

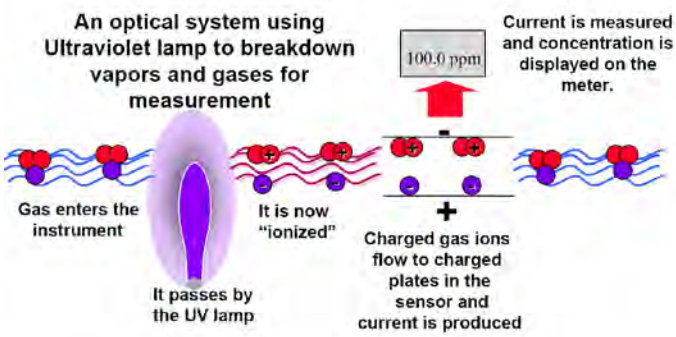
Section 9: Racket tests

9.1 Harmful volatile solvents measurement with MiniRAE-Lite®

The ITTF has banned volatile solvents from use on the racket. The limit has been decided by the ITTF Executive Committee as follows:

- from September 2009 to August 2010: maximum reading of 4,0 (4,0 is accepted);
- from September 2010 to August 2011: maximum reading of 3,0 (3,0 is accepted);;
- from September 2011 to August 2012: maximum reading of 2,0 (2,0 is accepted);.

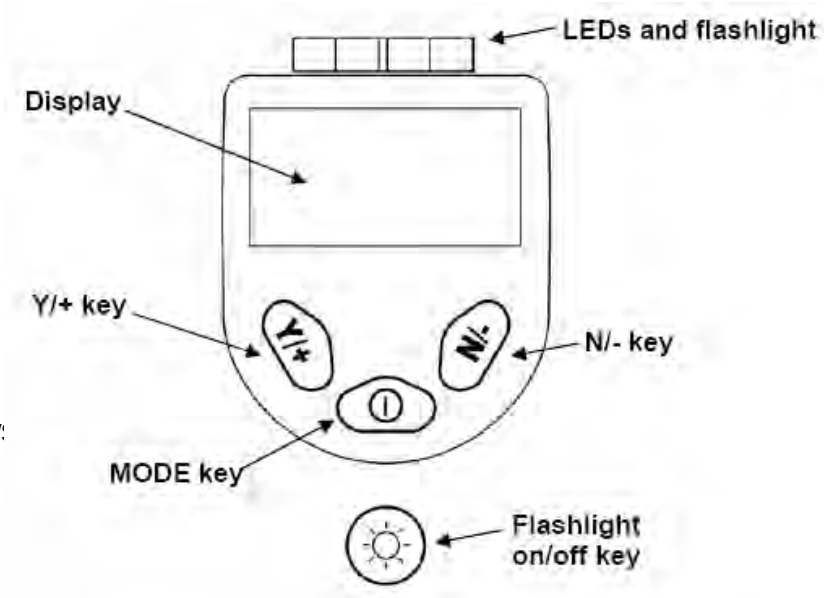
MiniRAE-Lite is currently used by the ITTF and is a photoionization detector (PID) which uses ultraviolet (UV) light (*photo* = light) source of 10.6 eV (electron volts) to break down chemicals to positive and negative ions (*ionization*) that can easily be counted with a *detector*.

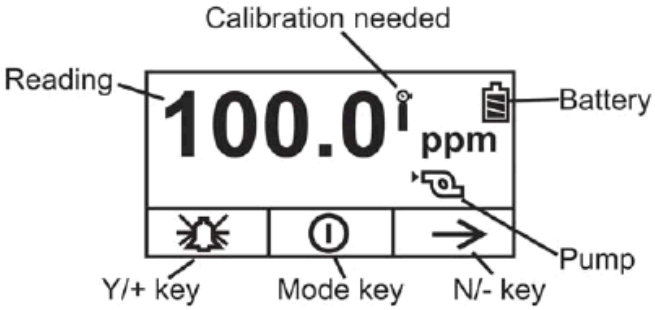


The instrument's user interface consists of the display, LED's, an alarm transducer, and four keys. The keys are:

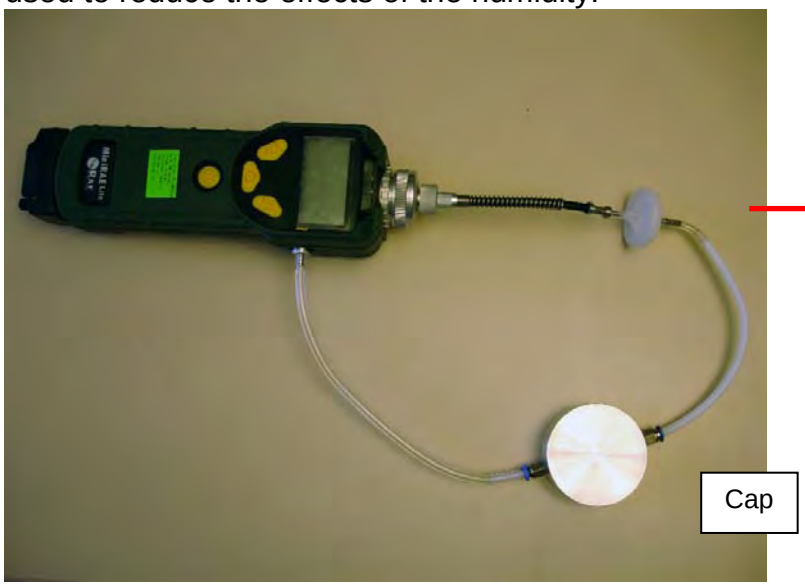
- Y/+
- MODE
- N/-
- Flashlight On/Off

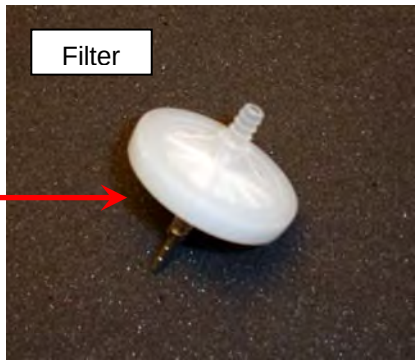
The display shows





For proper measurement on the surface of the coverings of the racket, the device is used together with a special cap connected by two Teflon tubes to the MiniRAE-Lite. A filter is used to reduce the effects of the humidity.





Steps to be followed to ensure correct measurement:

1. Connect the air outlet tube, which is with the device, to the threaded hole in the right side of the instrument.
2. Connect the flexible tube to the top part of the device and then the filter to this tube.
3. Once all accessories have been connected, each one has to be attached to the Teflon tubes of the cap.
4. To turn on the instrument press and hold the MODE key.
5. When the display turns on, release the MODE key.

6. When the display shows “Ready … Start sampling?” press the Y/+ key to start the measurement.
7. To start with a measurement of the gases released by a racket, read the background level on the display and write this reading in the Racket Testing Form 3a.
8. Then apply the cap to the middle of the racket for 20 seconds. After that, write the reading in the same form. The difference between the reading after 20 seconds and the background reading is the “real reading”.

RED SIDE	**BLACK** SIDE
Background level reading (A): _____ Reading after 20 seconds (B): _____ Real reading (B - A): _____	Background level reading (A): _____ Reading after 20 seconds (B): _____ Real reading (B - A): _____

9. Repeat the same procedure with the other side of the racket. But to do so, the device must be separated from the racket until the display displays its previous background level.
10. In those competitions where second RAE equipment is available, and when a racket is found with a reading over the allowed limit, the second device shall be used to confirm the result of the first measurement. If the second device also gives readings above the acceptable level then it is clear that the racket has failed the test. However, if the second device gives readings below the defined level then the racket is deemed to be within acceptable limits.
11. To turn off the instrument press and hold the MODE key for 3 seconds, and a 5 seconds countdown to shut off begins. Once the countdown stops and the display show "Unit off…" release the MODE key, and the instrument is now switched off.

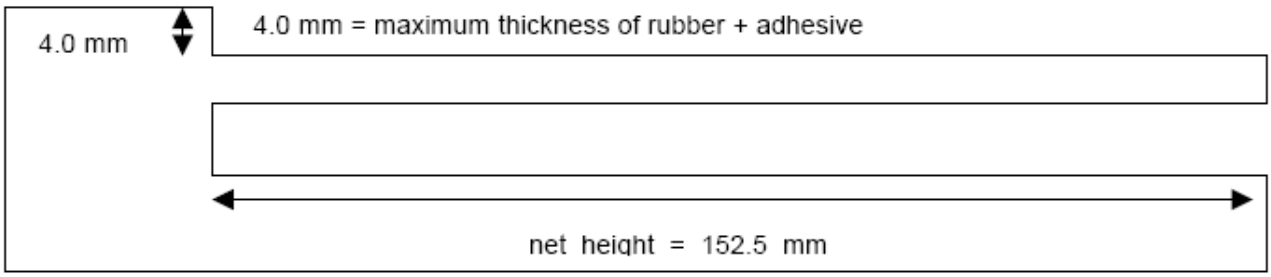
9.2 Thickness measurement

The thickness of a:

- ***sandwich rubber*** including the adhesive layer may not be more than 4.0 mm;
- ***pimpled rubber*** including the adhesive layer may not be more than 2.0 mm.

These values should not be exceeded on any part of the playing surface of a racket covering. This thickness refers to the total covering, including any reinforcement in the rubber (for instance textile) and any glue/adhesive used to attach it to the blade.

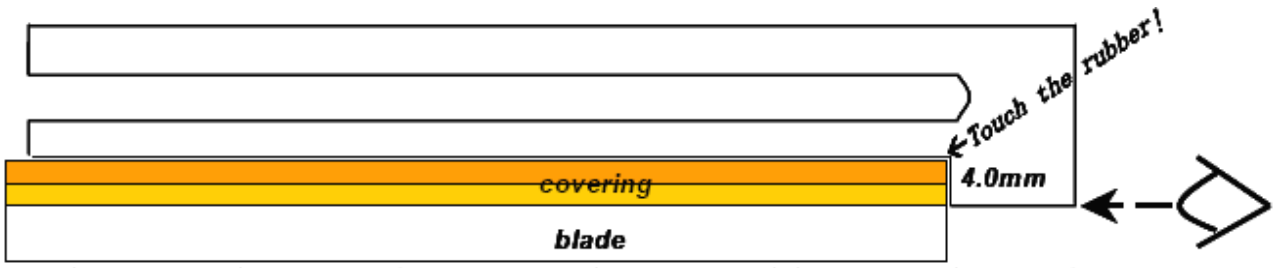
Umpires can make an intial thickness measurement with the net gauge. The net-gauge measures the height of the net (= 152.5mm) and the thickness of the rubber (≤ 4.0mm)



The umpire should check the thickness of the racket covering by:

- placing the net gauge on the rubber without indenting the covering;
- the edge of the gauge must touch the rubber at the measuring point;
- if the wider part reaches the bottom of the racket covering so that the observer, looking along the edge of this part in the direction of the side of the blade, does not see any sponge, the thickness of the rubber is not more than 4.0 mm;
- if the umpire suspects the rubber is too thick, he/she can report it to the referee, who may decide by testing with the rectangular indentation of the net measure, or a magnifying

glass with an integrated 0.1 mm scale, or refer the racket to the racket testing panel for a thickness test.



net gauge or net measure with a 4.0 mm rectangular indentation lying on the racket covering

Thickness measurement with electronic devices

These devices, in a support, are placed on the rubber with a dial and a pin which touches the bare zone of the blade between the handle and the end of the rubbers as shown in the figure below.

The diameter of the pin touching the blade shall be between 04.5 and 05.0 mm.

When a racket tester uses this device he/she must do 4 measurements on each side of the racket as follows:

- Firstly by placing the pin in each bare zone of the blade with the support placed along the racket parallel to the direction of the handle and making 2 measurements;
- Secondly by placing the pin in each bare zone of the blade with the support placed crossing the racket diagonal to the direction of the handle and making 2 measurements.

The final result of the thickness measurement shall be calculated by the average of these four measurements. An average of 4.04 mm or below should be recorded. An average above 4.04 mm should be recorded and must be referred to the referee.

Attention: it is important to note that, when a side of the racket has a convex shape, the result of the flatness test has to be added to the final thickness average of this side of the racket (see page 12).

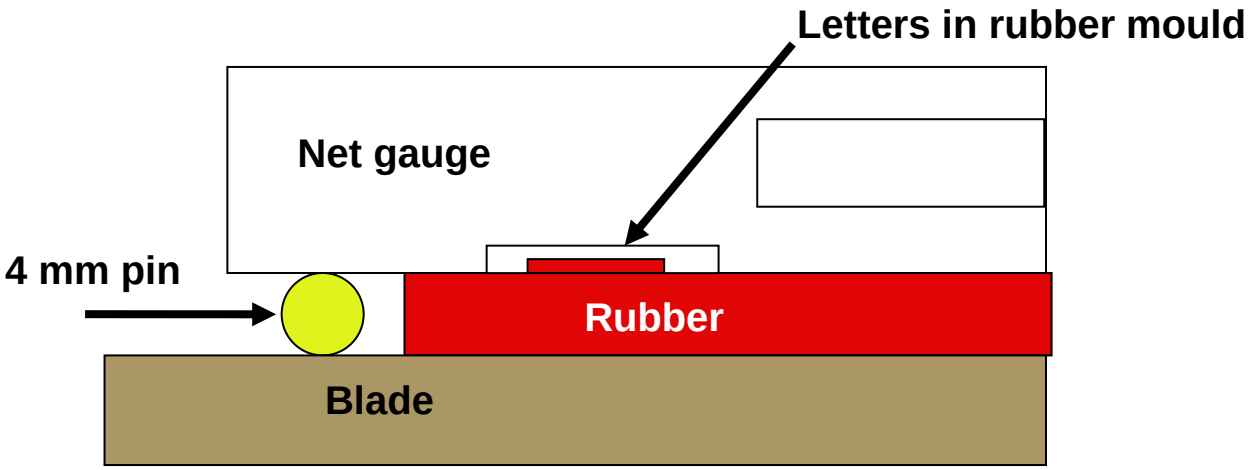
Thickness measurement with manual devices

The racket tester shall proceed as follows to measure the thickness of the rubbers:

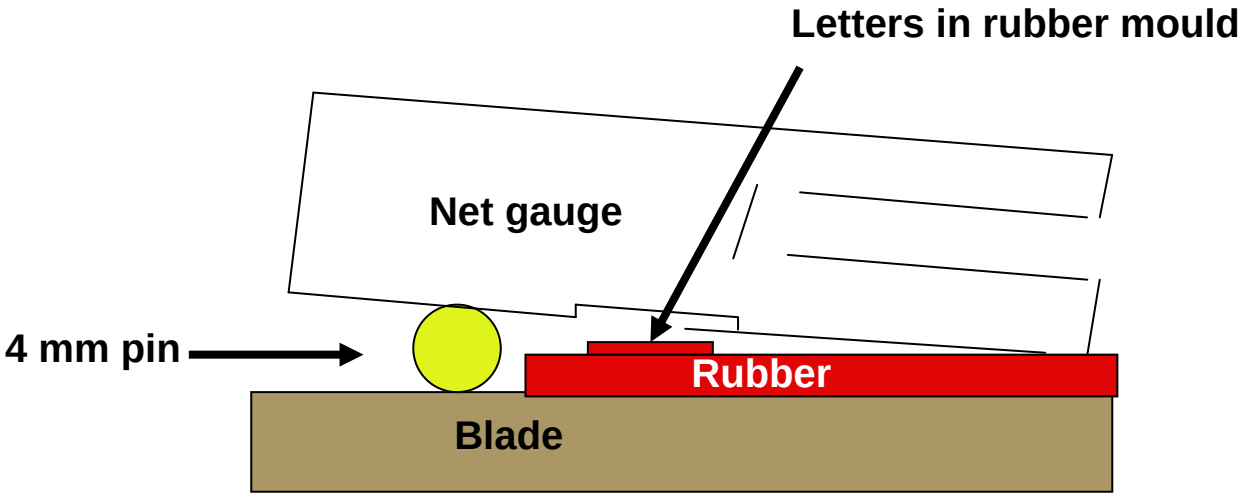
a) Place a metallic piece of a pin with a diameter of 4.0 mm in the zone of the blade between the handle and the end of the rubber.
b) Then across the rubber, place a ruler (which could be a net gauge) with a slot avoiding the height of the letters in the rubber mould (as shown below).

There are several possible results:

a) If the ruler touches the rubber and the pin at the same time the rubber is 4.0 mm thick and the result should be recorded.

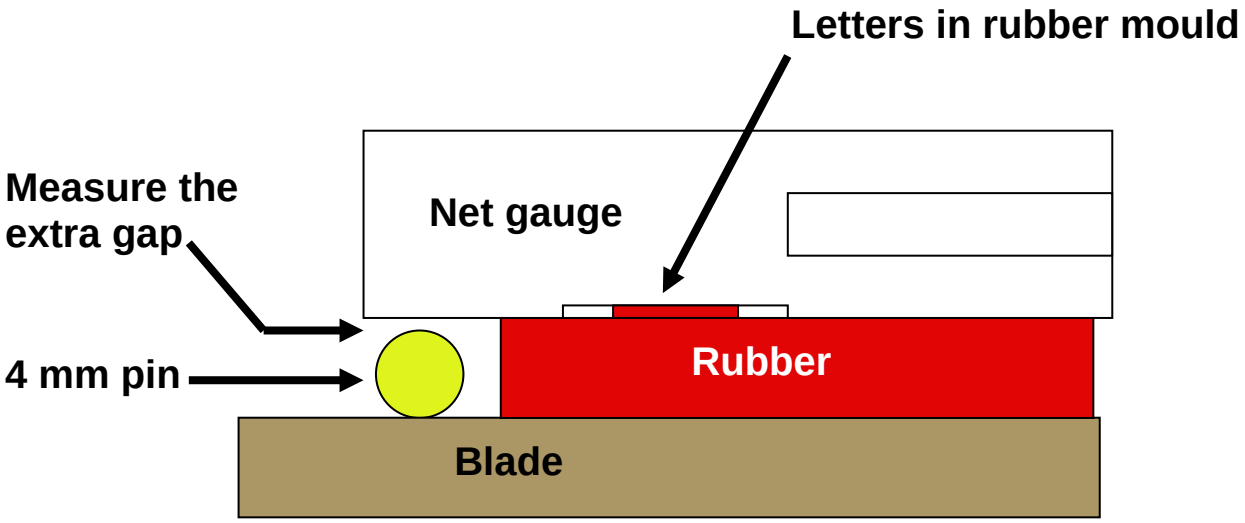


b) If the ruler touches the pin and the far side of the rubber (as shown below), it is less than 4.0 mm thick and the result should be recorded.

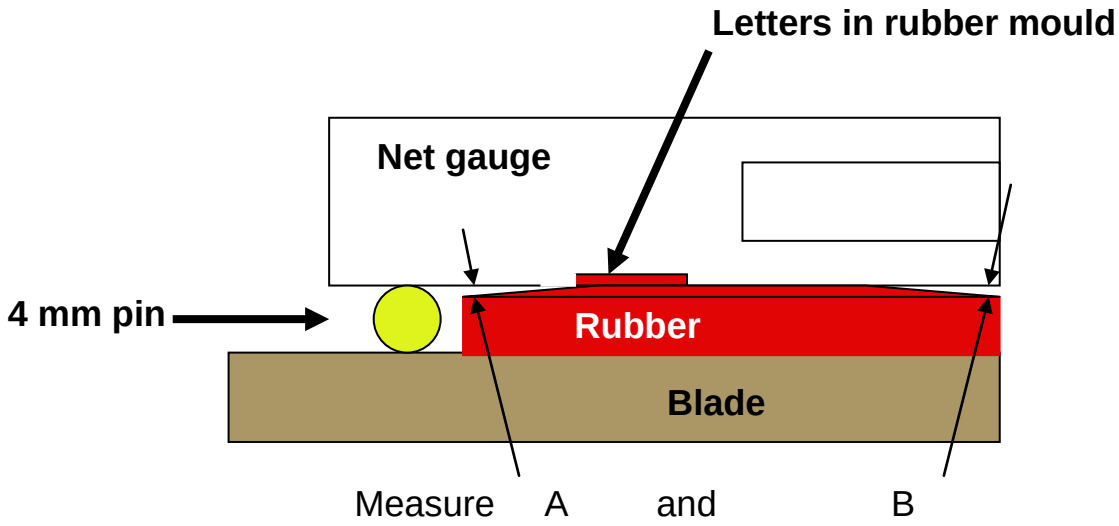


c) If the ruler touches the rubber, but not the pin, the rubber is too thick (as shown below). The gap between the ruler and the pin can be measured using a thickness gauge. The

maximum thickness which can be introduced between the pin and the ruler (without pushing up the ruler) will determine the value of the extra thickness of the rubber. The result should be recorded and must be referred to the referee.



d) If the ruler touches the rubber and the pin, but the rubber is not perfectly flat (i.e. the rubber has a convex shape up to a maximum of 0.2 mm as shown on page 11), the tester has to measure the remaining gap nearest the pin and at the end of the rubber (see picture below). If the gap near the pin is equal to or larger than the gap at the far end of the rubber, and this gap is less than 0.2 mm, the result should be recorded. If the gap at the end of the rubber is larger than the gap nearest the pin and larger than 0.2 mm, the result should be recorded and must be referred to the referee. To avoid any misunderstanding, the ruler has to always be in contact with the rubber and the pin when measuring this way.



A = B, max 0.2 mm A > B, OK A < B > 0.2 mm refer to referee

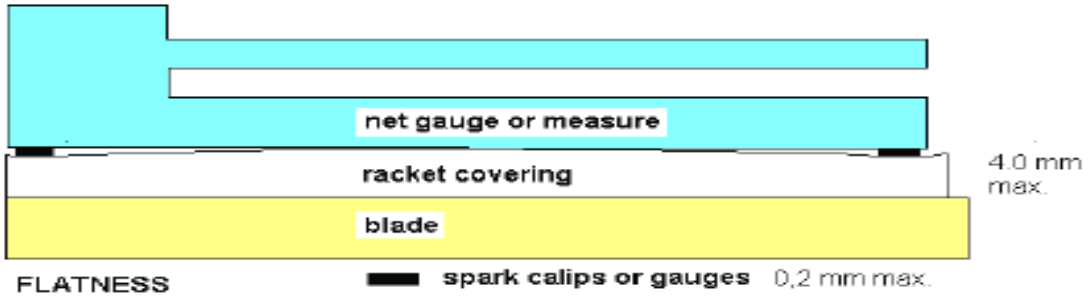
9.3 Powdering

Powdering can be detected with the naked eye and can be confirmed with a magnifying glass.

9.4 Concave vs. convex

The contours of the zones of different sponges under a top sheet are sometimes seen under a strong light. A glue pocket or a bent blade may render the racket centre convex*; a net gauge laid down as a ruler with its straight edge on the rubber and observed against the light should not show a gap between its ends and the rubber of more than 0.2 mm when the shape is convex, and no more than 0.5 mm when the shape is concave.

Any excessive height of the bump can be determined by using standardized steel blades (callipers or gauges for sparks), 0.2 mm thick for convex shapes, and 0.5 mm for concave shapes, that are laid under the ends of the net measure, but at a distance of about 2 mm from the side of the covering.



9.5 Flatness measurement

Flatness measurement with electronic devices

As in thickness measuring, these devices are in a support with a dial in the middle with a pin. The support is placed across the racket in different positions and the pin is placed on the rubber as well. If the rubber is not flat, the dial displays the difference as shown in the figure below.

The diameter of the pin touching the rubber shall be between 08.0 and 010.0 mm, and the pressure of the spring inside the dial shall be between 40 and 50 grams.

For convex rubbers, the dial shows readings over 0.00 mm (> 0.00), and for concave rubbers the dial shows readings below 0.00 mm (< 0.00). The maximum deviation for convex rubbers is + 0.2 mm, while for concave rubbers the maximum deviation is – 0.5 mm.

*To determine the reason of the bad flatness of a racket, 2 quick checks are available:

a) if a side of the racket is concave and the other side of the racket is convex, the blade is *bent* (with pimple-out rubbers this is not visible);
b) if the flatness at the convex side as well as in the prolongation of the handle (without including the area with the raised rubber name), if there is no gap, the blade is *warped*.

Steps for flatness measurement:

1. Check with a net gauge to determine the profile of both sides of the racket;
2. Check the flatness of both sides and fill in the results on the form;
3. Check the thickness of both sides, taking into account that, in case one of the sides has been found to be convex (a bubble) in the previous tests, the reading of the flatness test must be added to the final result of the thickness reading for this side of the racket, to determine the final thickness of this side. For concave sides, the reading with the thickness device shall be final.

9.6 Gloss measurement

Both sides of the racket should be matt in order not to distract the opponent, to dazzle the spectators or the TV cameras. The umpire must check the gloss of a racket covering or its base and report to the referee if a rubber is so shiny as to permit the shape of a light-source to be distinguished in its reflection or if the white big letters on a dark coloured net gauge held perpendicularly to the covering can easily be read at an angle of about 45°.

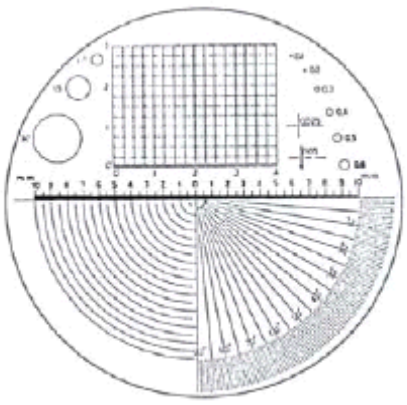
Gloss measurement by ASTM procedure D523:

1. The referee or the racket tester may measure the gloss of pimples-in rubbers by using ASTM procedure D523:
2. A 60° gloss-checker must give values less than 24%.
3. The gloss checker cannot measure the gloss of pimples-out rubbers.

9.7 Other Measurements

The racket covering may not be post-treated, for instance coated; otherwise it must be reported to the referee. However it is very difficult to determine if the rubber has been post-treated. The lack of friction, fine fissures in the top sheet, a special sound or bounce may be indicators, or a comparison with a standard authorized rubber sheet may be helpful.

With an 8x or 10x magnifying glass including a 0.1 mm scale it is possible, but difficult, to measure the height and the diameter of the pimples.



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Proposition to amend section 8.2 of Technical Leaflet T13

8.2 Registered testing pool

8.2.1. ITTF has identified a Registered Testing Pool of those players who are more specifically subject to out-of-competition testing. This pool includes:

a) **the top 20** players **on each of** the men's and women's ITTF world ranking list **issued in December each year** with a maximum of 5 men and 5 women per National Association
b) the **top** 10 players **on each of** the boys' and girls' ITTF under 18 world ranking list **issued in December each year**
c) at random, 10 men and 10 women from Para Table Tennis from the ranking list

8.2.2. ITTF may revise its Registered Testing Pool from time to time as appropriate.

8.3.2. The list of the players included in the Registered Testing Pool will be updated on ~~a quarterly~~ **an annual** basis starting on 1 January, and will be published on the ITTF website.

8.3.3. After 1 February, if a player no longer fulfils any of the above criteria, he or she will remain in the Registered Testing Pool until the end of the ~~current~~ **respective calendar** year **(31 December)**.

Note: these amendments will come into effect from 1 June 2011 if approved, using the May 2011 ranking list and from 2012, with effect from 1 January 2012 using the December 2011 world ranking list.