

## Racket Coverings

### Technical Leaflet T4

Chemin de la Roche, 11 1020 Renens/Lausanne, Switzerland

Tel +41 21 340 70 90 Fax +41 21 340 70 99

E-mail: [ittf@ittf.com](mailto:ittf@ittf.com)

---

## 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.

## Laws *(as of December 2008)*

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

### **2.4 The Racket**

- 2.4.1 The racket may be of any size, shape or weight but the blade shall be flat and **rigid**.
- 2.4.2 At least 85% of the blade by thickness shall be of **natural wood**; an adhesive layer within the blade may be reinforced with fibrous material such as carbon fiber, glass fiber or compressed paper, but shall not be thicker than 7.5% of the total thickness or 0.35mm, whichever is the smaller.
- 2.4.3 A side of the blade used for striking the ball shall be covered with either ordinary pimped **rubber**, with pimples outwards having a total thickness including adhesive of not more than **2**

**mm**, or sandwich **rubber**, with pimples inwards or outwards, having a total thickness including adhesive of not more than **4 mm**.

- 2.4.3.1 Ordinary **pimpled rubber** is a single layer of non-**cellular rubber**, natural or synthetic, with pimples evenly distributed over its surface at a density of not less than 10 per sq. cm and not more than 30 per sq. cm.
- 2.4.3.2 **Sandwich rubber** is a single layer of **cellular rubber** covered with a single outer layer of ordinary pimpled **rubber**, the thickness of the pimpled **rubber** not being more than **2 mm**.
- 2.4.4 The covering material shall extend up to but not beyond the limits of the blade, except that the part nearest the handle and gripped by the fingers may be left uncovered or covered with any material.
- 2.4.5 The blade, any layer within the blade and any layer of covering material or adhesive on a side used for striking the ball shall be continuous and of even thickness.
- 2.4.6 The surface of the covering material on a side of the blade, or of a side of the blade if it is left uncovered, shall be **matt, bright red** on one side and black on the other.
- 2.4.7 The covering material should be used as it has been authorised by the ITTF without any physical, chemical or other treatment, changing or modifying playing properties, friction, outlook, colour, structure, surface etc.
- 2.4.7.1 Slight deviations from **continuity** of surface or uniformity of colour due to accidental damage or wear may be allowed provided that they do not significantly change the characteristics of the surface.
- 2.4.8 At the start of a match and whenever a he changes his racket during a match a player shall show his opponent and the umpire the racket he is about to use and shall allow them to examine it.

## **International Regulations (as of December 2008)**

Regulations for International Competitions state that:

- 3.2.1.3 The covering material on a side of the blade used for striking the ball shall be of a **brand and type** currently authorised by

the ITTF and shall be attached to the blade so that the supplier and **brand** names and the **ITTF logo** plus the ITTF number (when applied) are clearly visible near the edge of the striking surface.

*Lists of all approved and authorised equipment and materials are maintained by the ITTF Office and details are available on the ITTF web site.*

## Definitions

**"4 mm"** maximum thickness of sandwich **rubber** ([The Law 2.4.3](#)), and **"2 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 covering including any reinforcement in the **rubber** (for instance textile) and any glue / adhesive used to attach it to the blade.

**"Brand and type"** ([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 with a white background.

**"Cellular rubber"** ([The Law 2.4.3.2](#)) is also called 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 within a frame for racket coverings. See C.1.1. and D.3. below.

**"List"** 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 surface of "pimples-in" **rubber** or of either the base of "pimples-out" **rubber** or the tops of the pimples are so shiny as to permit the shape of a light-source to be distinguished in its reflection.

**"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.

**"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 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 pimples **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 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 covering.

#### **1.2. Adhesive**

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

The manufacturers should be aware that the practice of "re-gluing", i.e. removing the racket covering, adding adhesive and re-applying the 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, which is mandatory at world-title 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 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**

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 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 covering, deviation from an ideal shape is not acceptable.

#### **1.4.2 Ordinary pimped rubber**

"Ordinary pimped **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.

#### **1.4.4. Friction for pimples - out**

The minimum friction level is 25  $\mu$ N. The **rubber** surface of the racket coverings should be uniform and without coating.

## **B. Quantitative Criteria**

### **1. The racket covering**

It should be noted in particular that:

Authorisation is given to the **top sheet** alone. Red and black **top sheets** with the same supplier and **brand** name must have the same geometry, properties, wording and numbering. The surface colours must be uniform. Such red and black **top sheets** do not require separate authorisation fees.

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.

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 covering too light.

### 1.1. Pimple dimensions:

In the **LARC** the racket coverings are categorised in four **types**:

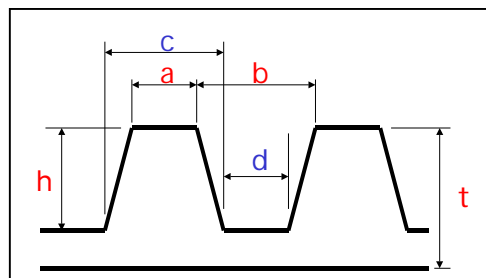
In = pimples-in (determined by the text in the mould),

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 <b>type</b>	Pimple diameter on top = A	Distance between pimple tops = B	Pimple height = H
<b>In and Anti</b>	min. 1.0 mm	min. 0.5 mm	min. 0.5 mm
<b>Out and Long</b>	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 New Form 1 which accompanies applications for new coverings.

**1.2. Rubber thickness:**  $T = \text{max. } 2.0 \text{ mm}$

**1.3. Aspect ratio;** i.e. pimple height / pimple diameter, shall not be greater than 1.10.

### 1.4. Gloss

An acceptable surface is one whose gloss, measured with an EEL gloss meter at  $45^\circ$  head setting, is not more than 6%; corresponding measurements of  $60^\circ$  specular gloss using ASTM procedure D523 must give values no greater than 24%.

## C. Rubber identification

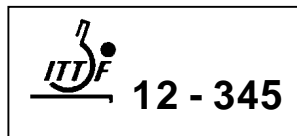
The combination of ITTF number / supplier name / **brand** name (in [The Law 3.2.1.3](#) called **brand** and **type**) is the identification of the covering, hence it must be unique and should not create confusion in relation with

other coverings. It must be the same number, supplier and **brand** names in the **rubber** mould 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, 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, 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 logo and number should be enclosed by a single frame of any shape, with nothing else inside.

Example:



**SUPER SUPPLIER**  
**MEGA BRAND**

When such a 5 or 6 digit **rubber** is withdrawn, that number cannot be used for at least 10 years.

In addition a 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 more than one picture 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 logo must be visible on the covering when it is mounted on the blade (see [The Law 3.2.1.2](#)).

## D. Administrative Procedure

### 1. *Submitting racket coverings for testing*

Racket coverings should be sent to the address given on the ITTF web site ([www.ittf.com](http://www.ittf.com) / Home Page / Main Page / Equipment / Racket Covering / Contact person), for the person in charge of racket cover authorisation procedures.

Full instructions are available there; however, the supplier should:

1. Submit racket covering samples, one of each colour, with no sponge. For pimples-out it may be required to make a friction test, and one extra sample may then be useful.
2. Submit the descriptive form (New Form 1) duly filled giving details of the racket covering. Copies of the Form may be obtained from the ITTF Headquarters in Lausanne, Switzerland or from the ITTF web site, which also contains instructions for filling out the Form.
3. Submit an image file of the text area - for the Internet version.
4. Pay the appropriate test fee to ITTF after an invoice is received.

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 List of Authorised Racket Coverings (LARC)*

New authorisations are listed only twice per year. The publication / printing of the **LARC** is normally 1. April and 1. October (both valid from that day). Those coverings which are leaving the LARC, are marked as still valid for 3 months.

The authorised racket coverings at any time are those in the valid version of the **LARC**, for the specified period. 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. Furthermore, there is a simplified method available to shorten the time, ref. the ITTF web site.

There should be no marketing of new racket coverings before the **LARC** has been published. If a covering is marketed before the covering appears in the **LARC**, the authorisation is void. However, the covering may appear in sales brochures etc. provided the validity date is clearly mentioned.

The **LARC** now omits all reference to sponge colours.

### ***3. 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 web site, under Equipment.

### ***4. Fees***

There is a **testing** fee, which must be paid before any actual tests are made. This is also the case for any extra tests made for suppliers and for the retesting of racket coverings after a period off 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). Lack of payment will mean withdrawal from the **LARC**.

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.

### ***5. 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.

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

### ***6. 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 covering as authorised, without alterations.

### ***7. 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 coverings are permitted in ITTF-authorized events and have the right to carry the **ITTF logo**. All other coverings of any other colour are illegal.

### ***8. Re-testing of racket coverings***

Racket coverings will be re-tested approximately every ten years after having been on the **LARC**. The suppliers will be notified, 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 - we will expect the sum of the pimple diameter on top (A) plus the distance between the pimple tops (B) to 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**.