



# The Racket and Racket Covering

Technical Leaflet T4

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## Introduction

Most table tennis equipment is provided by club or competition organisers, and during 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 few decades. But it was then realised 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 (for full details see Technical Leaflet T7), 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.

## Laws

The Laws of Table Tennis relating to the racket and racket coverings 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 fibre, glass fibre 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 pimples rubber with pimples outwards having a total thickness including adhesive of not more than 2.0 mm, or sandwich rubber with pimples inwards or outwards having a total thickness including adhesive of not more than 4.0 mm.
  - 2.4.3.1 *Ordinary pimples 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 50 per sq. cm.
  - 2.4.3.2 *Sandwich rubber* is a single layer of cellular rubber covered with a single outer layer of ordinary pimples rubber, the thickness of the pimples rubber not being more than 2.0 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 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; any trimming round the edge of the blade shall be matt and no part of it shall be white.
- 2.4.7 Slight deviations from continuity of surface or uniformity of colour due to accidental damage, wear or fading 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 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.

## Additional Criteria for authorisation

### Adhesive

The use of a thick layer of adhesive is permitted neither within the blade (see 2.4.2) nor between the blade and the covering. Manufacturers should be aware that the practice of "regluing", i.e. removing the racket covering, adding adhesive and reapplying the covering immediately before a match, may cause rubber to expand. When measured by an umpire the resulting thickness may be found to be illegal.

### Pimpled rubber

In addition to the requirements of 2.4.3.1:

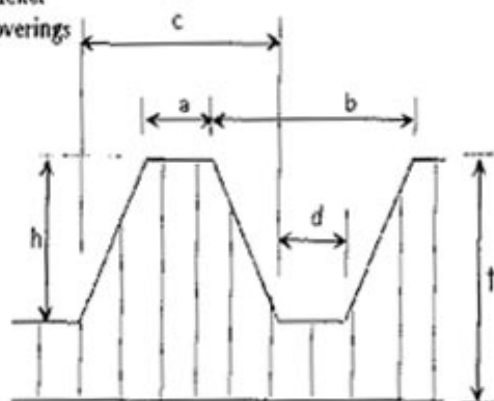
"Ordinary pimpled rubber" may carry pimples on one side only; the other side must be smooth, although it may be bonded to a thin layer of fabric, which should not be visible on the playing side.

Each pimple must have 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 roughened (up to 0.1 mm) or smooth, though not to an extent that would constitute hollowness in the pimple.

Racket coverings



Pimples	a	b	h
In	min. 1.0 mm	min. 0.5 mm	min. 0.5 mm
Out	1.0-2.2 mm	1.0-2.0mm	min. 1.0 mm

Dimensions "c" and "d" are indicated here, since they must be reported in the form which accompany applications for new coverings.

The aspect ratio, height/diameter, shall not be greater than 1.30.

The list of authorised racket coverings now omits all reference to sponge colours. Translucent red may not be used over dark sponges or dark blades, and translucent blacks may not be used over light sponges or light blades.

### 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 upper layer 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.

### Blade

A very thin layer of lacquer is permitted on the blade, only for the purpose of anchoring wood fibres, 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.

## ITTF Authorisation

The procedure is described in detail in Technical Leaflet T7, and it should be noted in particular that:

Red and black topsheets with the same supplier and brand name must have the same geometry, properties wording and numbering. They do not require separate authorisation fees.

When applying for authorisation, a descriptive form giving details of the racket covering must also be submitted. Copies may be obtained from the ITTF Administration Centre in England or from Mr. Odd Gustavsen (see last page for address).

All coverings submitted for authorisation must have the supplier and brand name in Roman letters and bear the ITTF logo as specified in T7 in the mould. The logo should be min. 10 x 10 mm. All letters and the logo should be placed towards the same edge of the sheet and should have a height above the rubber base not less than 0.1 mm for readability.

There must be a consistency between the names in the rubber in the rubber mould and in the list "Authorised Racket Coverings" (ref. 3.2.1.3).

The letters and the logo must be included in the covering when it is on the blade (see 3.2.1.2).

Authorisation is given to the topsheet alone. It is the player's responsibility to limit the total thickness of his racket covering to no more than 4.0 mm, including topsheet, sponge and adhesive.

## International Regulations

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 in such a way that the trademark and the ITTF logo are clearly visible near the edge of the striking surface.
- 3.2.1.4 Coverings may be attached to racket blades only by means of pressure-sensitive adhesive sheets or authorised adhesives; a player whose racket is found to contain a prohibited adhesive shall be disqualified from the competition in which he is taking part and reported to his parent Association.

### Solvent Vapours

Three classes of volatile organic solvents are strictly controlled in the racket: Aromatic (benzenoid), especially toluene; halogenated, especially trichloroethylene; and n-hexane. If these are used at any stage in the manufacture or assembly of the racket (e.g. manufacture of rubber, gluing of topsheet to sponge, gluing racket covering to blade, or using rubber-cleaning formulation) the racket must be exposed to air for a sufficient time before use in play so that the solvent has essentially all evaporated.

Manufacturers should expose rackets or sandwich-rubber combinations to air before packing them, and players should similarly air their rackets after use of anything that could contain one of the banned solvents. The permissible residuals are given in our instructions for glue testing, which is mandatory at world-title events.

Suitable glues include PSA (pressure-sensitive adhesive sheets), water-based systems, and those based on volatile organic solvents not in the above three classes. Lists of those approved are published in the ITTF Bulletin.

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 tradename and instructions for use.

All containers of liquid organic-based adhesives, including small tubes, should carry appropriate hazard warnings, including for flammability, and the caution: "Not to be used by children". All warnings must be in the language of the country in which the product is sold.

None of the above should be taken to preclude other types of adhesive, such as heat-sealable types, that do not contain volatile solvents. The only purpose in the above limitations is to eliminate the toxicity hazard of certain organic solvents.

## Definitions

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

"Rubber" 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.

"Continuity" 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.

"4.0 mm" maximum thickness of sandwich rubber (2.4.3) and "2.0 mm" maximum thickness of pimples rubber (2.4.3, 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. Both of these thicknesses refer to the total of the covering and any adhesive used to attach it to the blade.

"Matt" surface (2.4.6) is one whose gloss, measured with an EEL glossometer at 45° head setting, is not more than 6%; corresponding measurements of 60° specular gloss using ASTM procedure D523 must give values no greater than 24%. Regardless of this overall degree of gloss, however, 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 is so shiny as to permit the shape of a light-source to be distinguished in its reflection.

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

Hue: 4.0-6.5R  
Value: 3.1 minimum  
Chroma: 7.5 minimum

"Rigid" in 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.

"Topsheet" refers to the sheet of pimples rubber when used over a sheet of sponge.

Any manufacturer wishing to have racket coverings measured may send them to Mr. Odd Gustavsen (see last page for address)

In addition to the supplier and brand names and the ITTF logo, a covering may carry the name of a country or that of the Association in that territory, or both.

Although only red and black coverings are permitted in ITTF-approved events, coverings of other colours are available still bearing the ITTF logo. The use of such coverings in any event is unacceptable use of the logo, which is ITTF property.

New authorisations are listed only once per year (see T7). New samples should be submitted during the first half of June at the latest in order to be on time for the coming season's list. They should consist of the topsheet only, in both colours, with no sponge.

If it is desired to reauthorise a covering that has been removed from the list, it will be treated as a new covering and a new fee will be payable.

It should be noted :

(a) that the Equipment Committee has been instructed to deny authorisation to any racket covering that it deems detrimental to the sport, and

(b) that Council has the right to withdraw the authorisation of any racket covering at any time, if it finds it detrimental to the sport.

Furthermore, 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.

## Address

Samples of racket coverings should NOT be sent to the ITTF Administration Centre or other ITTF addresses, but should be sent both to the Chairman and Secretary of the Equipment Committee.

*Chairman* Dr J. Rufford Harrison  
Box 462  
Washington, NH03280, USA  
Fax: 1 603 4951093  
e-mail: r\_harrison@conknet.com

*Secretary* Mr Odd Gustavsen  
Sørlistien 22  
N-1473 Skårer  
NORWAY  
Fax: 47 22 638347  
e-mail: odd.gustavsen@alcatel.no

Samples of Adhesives for approval (including PSA and liquid glues) should be sent to:

Dr Keith Powell  
3 Mosspark Road  
Dumfries  
DG1 4EG  
Scotland  
Fax: +44 1387 266552

