

Adhesives

Technical Leaflet T4B

Edition from 1st January 2006

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Chapter 1: Introduction

Adhesives have been widely used in many applications in nature as well as industry for thousands of years.

In table tennis rackets, adhesives are used:

- To join the handle to the blade,
- To join the layers of wood and reinforcing fibre within the blade,
- To join the rubber to the sponge,

and more importantly,

- To join the racket covering to the blade.

Chapter 2: International Regulations

The International Regulations of Table Tennis relating to the adhesives are:

3.2 EQUIPMENT AND PLAYING CONDITIONS

3.2.1 Approved and Authorised Equipment

3.2.1.1 The approval and authorisation of playing equipment shall be conducted on behalf of the Board of Directors by the Equipment Committee; approval or authorisation may be withdrawn by the Board of Directors at any time if its continuation is found to be detrimental to the sport.

From 1st January 2006 new glues will only receive the ITTF authorisation if they are based on not volatile organic solvents.

3.2.4 Gluing

3.2.4.1 Coverings may be attached to racket blades only by means of pressure-sensitive adhesive sheets or adhesives that do not contain a prohibited solvent; a list of prohibited solvents is available from the Secretariat.

3.2.4.1.1 Adhesives containing volatile organic solvents shall not be used at the playing venue from 1st September 2006 on and shall not be used at all from 1st September 2007 on.

3.2.4.2 Tests for prohibited solvents will be carried out at World and Olympic title competitions and major Pro-Tour tournaments and a player whose racket

is found to contain such a solvent is liable to be disqualified from the competition and reported to his Association.

- 3.2.4.3 A properly ventilated area shall be provided for the attachment of racket coverings to rackets and liquid adhesives shall not be used anywhere else in the playing hall.

Chapter 3: Definition and composition

There are several ways to define an adhesive. Here are two of them:

- A material that is capable of joining bodies together by surface adhesion and internal cohesion without the structure of the bodies undergoing significant changes.
- Substance capable of joining two surfaces in a strong and permanent way.

Table tennis adhesives usually have elastomeric or thermoplastics resins as the base or binder. This resin is put into liquid form by adding a solvent, and adding plasticizers, tackifiers, fillers and other components to modify the properties of the resulting adhesives.

Those adhesives that table tennis players use for holding the rubber to the blade are classified as contact adhesives by loss of solvents: the main function of the solvent is to lower the viscosity of the resin so that it can be easily applied to the substrates. Once the adhesive is applied to both substrates, the solvents are largely removed by evaporation into the air, and the virtually dry substrates are mated under pressure so that the adhesive coatings knit together.

Chapter 4: Volatile organic solvents: risks

The solvents may harm our health in three ways, depending how they get into the body:

- ♦ By inhalation: the most important way, the vapours of the solvents in the air are breathed and go easily through the lungs to the blood.
- ♦ By contact: the solvents go directly through the skin to the blood.
- ♦ By ingestion: the solvents may be ingested through the mouth by contact with the hands, etc...

Another important factor influencing the health of those who use solvents is the time of exposure.

Most of the solvents are also highly flammable, and their mixture with air can explode on the contact with a flame or static spark. They also may cause long-term adverse effects in the environment.

International safety laws regulate very strictly the conditions of composition, packaging, labelling, transport, sale and use of organic solvents.

Chapter 5: ITTF Approval Procedure

Because of the hazards mentioned in the previous section, the International Table Tennis Federation prohibits the use of volatile organic solvents in the composition of adhesives to be used in table tennis.

Any solvent with a vapour pressure even or above 0,3 milibars (0,004 psi) shall be considered as volatile.

Any substance considered or suspected to be carcinogenic, mutagenic or teratogenic – whether or not a volatile organic solvent – shall also be prohibited in the composition of the adhesive.

The ITTF Equipment Committee has therefore elaborated a procedure for authorising adhesives that guarantees that none of these banned substances is present. A supplier wishing to obtain the authorisation of a new adhesive should proceed as follows:

1. Contacts with the adhesive specialist of the ITTF Equipment Committee by e-mail (the e-mail address of this person appears in the ITTF website “www.ittf.com”).
2. Pay the testing fee to the ITTF Headquarters.
3. Send a sample of the adhesive in its original package , and with the original labels to be marketed, to the adhesive specialist in the ITTF Equipment Committee (see ITTF website). Send the following data together with this sample:
 - 3.1. Exact name of the glue.
 - 3.2. Name of distributor.
 - 3.3. Address of distributor.
 - 3.4. Name of responsible person of the distributor.
 - 3.5. Fax, telephone and e-mail of distributor and the responsible person.
 - 3.6. Name of manufacturer.
 - 3.7. Address of manufacturer.
 - 3.8. Fax, telephone and e-mail of manufacturer.
 - 3.9. Copy of an analysis of the composition of the adhesive done by an accredited laboratory.

The sample will be sent to an accredited laboratory identified by the ITTF Equipment Committee for testing.

The laboratory will make a Headspace Gas Liquid Chromatography (GLC) quantitative analysis of the sample and will submit a written report to the ITTF Equipment Committee. The method will consist, roughly, in heating 0.1g-1.0g of the adhesive at 80°C for 30 minutes and injecting the vapour phase containing a part of the solvents in the chromatograph where the individual compounds are separated and identified by the means of their mass spectra. If this GLC shows any concentration of the ITTF banned substances, the adhesive will not receive the ITTF authorisation.

If this analysis is negative (absence of any of the forbidden substances), and the label of the adhesive contains the relevant information, the ITTF specialist will send a report to the ITTF Headquarters, who will send to the supplier the relevant invoice for the authorisation fee. Once this fee has been paid, the adhesive will be authorised and the supplier may use the ITTF logo in the label of the adhesive as long as the yearly fees are paid.

Re-testing

The ITTF'S adhesive specialist may make random tests of adhesives bought in the market. If a result of a re-test is positive, he shall so report to the supplier and to the ITTF Headquarters, recommending removal of the ITTF authorisation.

If the result of the test is positive (contains any of the forbidden substances), the ITTF specialist shall send a report to the supplier, as well as the ITTF Headquarter, for removing the ITTF Authorisation.

The suppliers shall pay the costs of these tests as testing fee.