Nicklas Georg*, Kraus Thomas*, Tiefenbacher Konrad**
**ESN Elastomer GmbH, Germany*
***Wassing Messtechnik GmbH, Germany*

FACTS ABOUT SPEED GLUE

Abstract

In its environmental charter, "Agenda 21 of the Olympic Movement", the IOC defines its stance on hazardous substances in sports products as follows:

"...the members of the Olympic Movement undertake ..... to avoid using products recognized as being hazardous or toxic to humans or environmentally polluting."

As a member of the Olympic Movement, the ITTF has decided to introduce a ban on the organic solvents used in speed gluing with effect from September 2007. The authors of this report have set themselves the task of presenting facts associated with the following aspects of speed gluing and the use of organic solvents: current actual speed gluing practice and the quantities of solvents used and released into the air, the statutory provisions regarding organic solvents in Europe, the actual risk potential and the hazardousness of organic solvents.

Speed gluing is currently characterised by the desire of players to "tune" their rubbers to the point of maximum performance using speed glue. To do this, more than 20g of organic solvents is needed for one rubber. 85% of this escapes into the air. Having looked at all the relevant safety datasheets, it has been established that all organic solvents are dangerous to health. They are toxicologically effective and many of them also damage the environment. In Europe, speed glues have to carry a warning notice on the packaging stating that they "must be kept out of reach of children". Under the terms of Germany's Youth Employment Protection Act, young people under the age of 18 and children may not be exposed to organic solvents at all unless it is necessary, and even then only if supervised. A factor that has so far gone largely unheeded is the tendency of organic solvents to form explosive mixtures when combined with air. Using a simple model calculation it was possible to show that, in unfavourable circumstances, it is entirely possible for explosive mixtures to form during speed gluing. Finally, data was gathered showing the extent of "glue sniffing" in Europe and the third world. The findings of one international study show that in many European countries 10-20% of schoolchildren have "sniffed" at least once. In the third world, a large proportion of homeless children are dependent on glue sniffing.

The authors consider it their task to assemble these facts. The evaluation of the facts and the requisite decisions are in the hands of the ITTF and the national associations.

Key words: *table tennis, glue, speed glue*

The purpose of this research

Speed gluing started in the 1970s, its invention being attributed to the Hungarian Tibor Klampar. It is said that this ingenious player's partners were astonished by the sound his bat made during training and, using espionage-like techniques, discovered that before every training session he secretly applied his rubber to the bat afresh, gluing it over again. Since that time the practice of speed gluing has spread widely. These days when children are being coached, the question arises as to whether they should start to play using speed glue, or whether they should first learn the basics of the technique. The reason for this radical change in our sport lies in the special sound of a "speed glued" bat and in the ceremonial aura surrounding speed gluing. Opponents of speed gluing complain about the odour pollution in the changing rooms and the risk to health. The subject is a highly emotional one.

The ITTF's Board of Directors has ruled that from September 2007 the use of organic solvents to attach the rubber to the bat will be banned. The emotion that is characteristic of speed gluing has naturally taken over the discussion about this decision. It was for this reason that the authors of this report set themselves the task of assembling only such aspects of the debate as are based on fact. Facts and data have been gathered from various groups involved with speed gluing. This information should help the decision-making body to reach a conclusion about speed gluing that is good for the future of the sport of table tennis. The authors have endeavoured to refrain from any value judgements and to report only factual information.

1. What causes the speed gluing effect in table tennis rubbers?

The speed glues currently still approved by the ITTF consist of two fundamentally different chemical components:

Main component, 85-90%:	organic solvents
Actual glue 10-15%:	natural rubber/resin mix

The organic solvents alone are responsible for the speed-enhancing and spin-enhancing effects of speed gluing. The natural rubber/resin component is neutral in terms of its effect on the rubber.

The speed gluing effect could therefore also be achieved purely through solvents, which is the case in practice to some extent already.

When speed gluing is carried out, some of the organic solvents evaporate into the air and some enter the rubber (quantitative analyses of this are shown below). This causes a change in the physical characteristics of the rubber. In practical terms, it causes the ball to rebound from the bat during play with greater speed and more spin. Since the effect does not last long, the procedure has to be repeated at regular intervals.

2. Speed gluing in practice

2.1. Peak performance of a table tennis rubber that has been "speed glued"

Tibor Klampar had noticed that a freshly glued bat was faster in play than the same bat one week later. For this reason, he tried to repeat the gluing process. It is no surprise that the performance-enhancing effect of the organic solvents is dependent on the quantity used. In practice, players know this: the more you glue, the faster the bat becomes. It is also a well-known fact that the effect does not continue indefinitely and starts to decrease at a certain point. We have investigated these assumptions scientifically and conducted the following experiment. The glue quantities were measured using a laboratory scale:

1st gluing: 1.5g of an approved, well-known European glue with fairly high adhesion (a somewhat lower proportion of solvent) was applied first (for the purposes of later adhesion on the blade). Then 4g of approved, fluid speed glue, also European, (with a high solvent content) was applied. All further gluing procedures were carried out using this glue. Once the glue ceased to draw threads when touched, another 3g of speed glue was applied. The rubber was then measured using the "Wassing Dom" device (see [1] for technical details) to determine its spin/speed performance. And a trial game was played to produce a comparison with actual practice.

2nd gluing: 3g of speed glue was applied. After ventilation, the gluing procedure using 3g was repeated. Measurements were then taken using the Wassing Dom device and a game was played.

3rd – 6th gluing: Repetitions of stage 2.

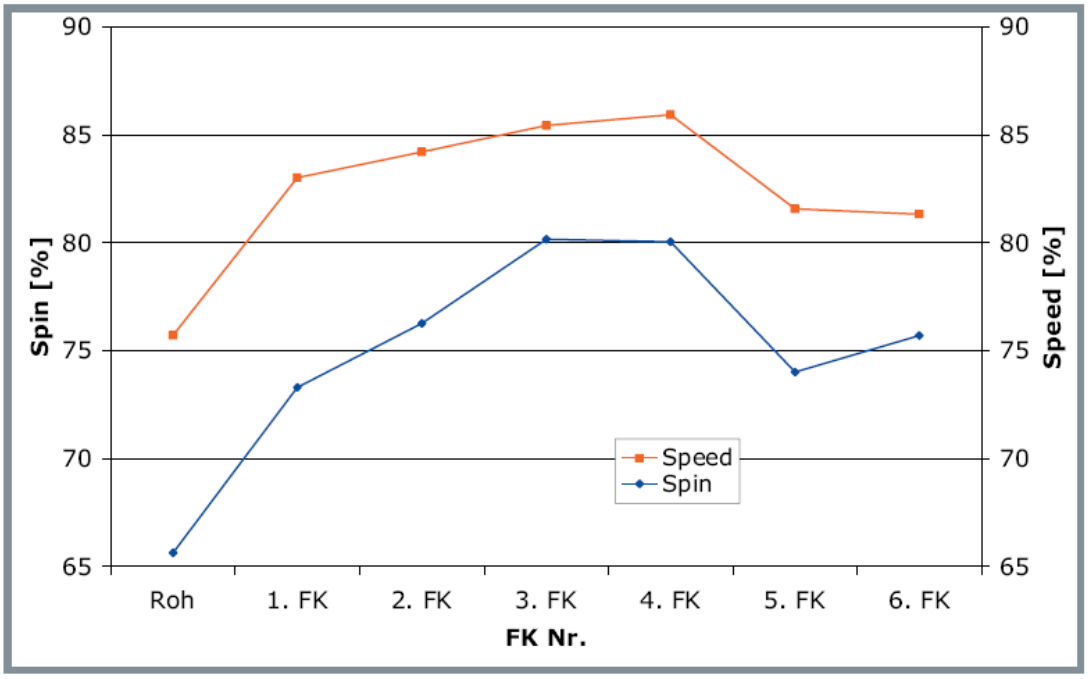

Diagram 1: Spin and speed in relation to the respective number of speed glue applications

Diagram (1) shows spin and speed in relation to the respective number of speed glue applications. It can be seen that both the speed and particularly the spin increase until the third gluing procedure, stay more or less the same with the fourth, and then decrease.

These findings are in line with the professionals' speed gluing experience. They make several applications using a large quantity of speed glue before playing for the first time. They then use only moderate quantities of glue and change the rubber after only a few training sessions. In this way they maintain the rubber at its peak during the brief period of use.

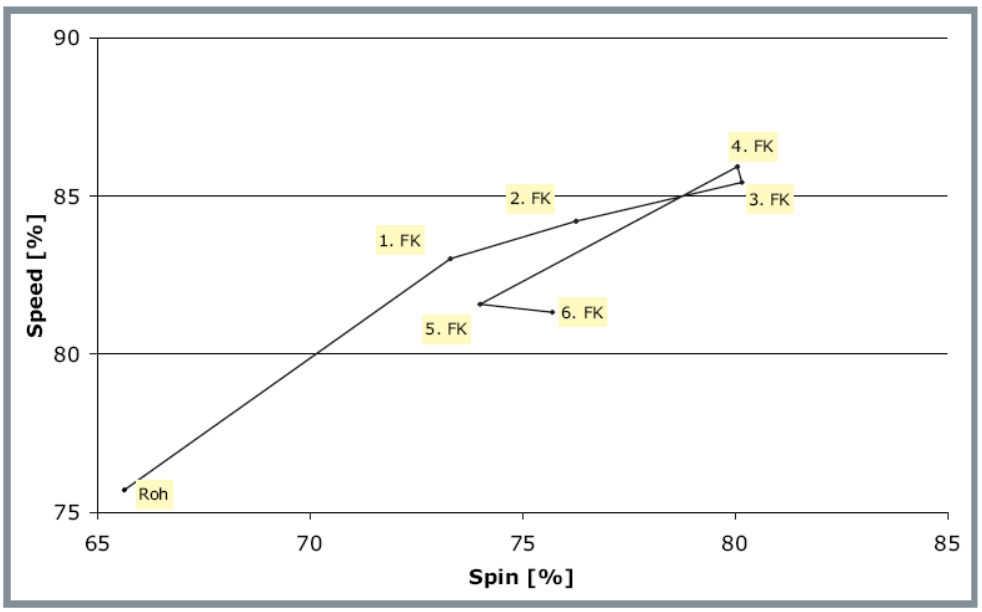

Diagram 2: Performance enhancement by speed gluing in spin/speed relationship

It is also possible to show spin in direct relation to speed as shown in the diagram (2). The enhancement of and the decrease in performance can then be seen even more clearly.

This type of measurement using exactly the same gluing procedure was carried out on all rubbers currently on the market. The behaviour of the rubbers essentially follows the same pattern. It was also repeated using different approved glues and in these cases also followed the same pattern. The measurements taken for spin and speed were regularly in line with the impressions reported by the test individuals.

It can be affirmed that a minimum quantity of 20g of speed glue is always needed in order to bring a traditional rubber backed with sponge of 2.0 – 2.2mm depth to its peak performance.

2.2. The speed gluing procedure practised by a professional

A young player at national level (amongst the top 80 male players in the world) from a leading country has described to us his personal speed gluing procedure as follows:

- I glue 2 new rubbers the night before a match
- I glue 5 coats of speed glue onto each rubber
- I leave the glue to take effect for a short while in between each coat
- After the 5th coat I apply a coat of glue onto the blade and attach the rubber to it whilst wet and allow it to soak in overnight. (A film is placed over the rubber to prevent the solvent from escaping, and the entire bat is placed in a bag).
- On the morning of a match I break in the rubber by playing, because it doesn't reach its full potential the first time you play.
- Before breaking it in, I always attach the rubber with 3 coats of speed glue, allowing the speed glue to soak in between each coat, and after the final coat I apply a coat to the blade. When it's all touch-dry, I attach the rubber to the blade.
- Before a competition I then apply a further 3 coats in the same way.
- With my style of speed gluing, the rubber reaches its optimum potential after 11 coats.

Considering the process described from a scientific perspective and from the point of view of establishing facts, this empirical procedure is unsatisfactory because no quantitative data has been gathered about the glue used. For this reason, we conducted an experiment in conjunction with Philippe Saive, a professional player, in which Saive carried out the gluing procedure in his own way and we were able to gather and document the quantitative data.

It emerged that the total quantity of speed glue used over every stage of the procedure in order to tune the rubber to its performance peak was >20g.

Based on the experiences of the professional players and our own measurements as described in 2.1, we developed a standard speed gluing procedure, using which we are able to bring rubbers to their performance peak in a reliable, reproducible manner. Using the organic solvents currently approved by the ITTF, a quantity >20g of speed glue is always necessary. The effect obtained with 11 applications by the young professional quoted above can be obtained by more or fewer coats depending on the dosage. In our standard procedure (see 2.1), we use 7 applications. It is a fact that one application does not bring the rubber to its peak and that it needs >20g speed glue to bring it to this point.

There is a further aspect of the professionals' gluing practice: where does a player actually carry out his first gluing procedure "the night before"? The DTTB has banned speed gluing in confined spaces. Does this mean that players carry out their preparation the night before in the open air? The practice of bringing the rubber up to its performance peak in several gluing phases is not confined to professionals. We know from our experience and many conversations with players that this practice has become very widespread over the years. The fact that a rubber needs >20g glue in order to develop maximum performance inevitably gives rise to the idea of pre-gluing.

The process of pre-gluing raises yet another question: where does the player store the bats that he has soaked with solvents? Since we are only dealing with facts here, we will leave this as an unanswered question.

2.3. The amount of solvent that escapes into the air

The standard gluing procedure was carried out and at each stage of the process the weight of the rubber was also measured at intervals.

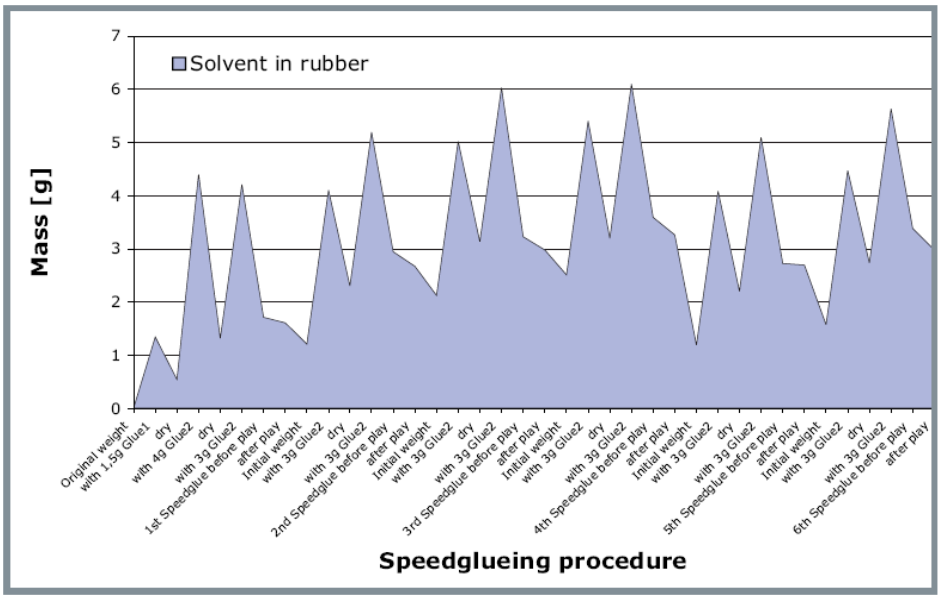

Diagram 3: Quantity of solvents in relation to individual stages of gluing procedure

This provides, first and foremost, information about the quantity of effective solvent. In diagram (3) this quantity is shown in relation to the individual stages of the procedure. It is possible to see how the solvent is absorbed by the rubber and then volatilises again. This also explains the reduction in playing characteristics after a lengthy break.

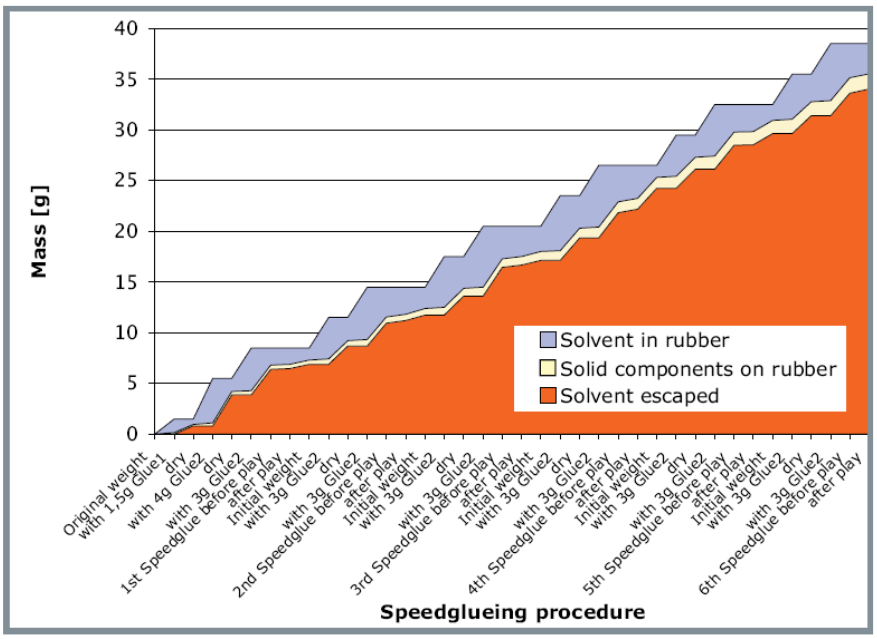

Diagram 4: Quantity of solvent remaining in the rubber and escaping into the air

In diagram (4) it is possible to see and calculate how much solvent proportionally remains in the rubber and how much escapes into the air. The latter is particularly important in terms of this study. At the start of the speed gluing procedure, a great deal of solvent is absorbed by the rubber, but the quantity absorbed becomes more or less constant later, and most escapes into the air. When a rubber has reached its performance peak, some 15-20% of the solvent has been absorbed and 80-85% has escaped into the air.

3. Organic solvents and their potential risk

In an analysis conducted by the DIK (*Deutsches Institut für Kautschuktechnologie*/German Institute of Rubber Technology) in 2001, a study was conducted on two speed glues, one from Belgium and one from Germany, The following findings were recorded:

Belgian glues: the main components of the solvent mixture are C_7-hydrocarbons (trimethylbutane, dimethylpentane, 2-methylhexane, 3-methylhexane, heptane, methylcyclohexane and ethylcyclopentane). Additionally, the C_8-alkane dimethylhexane, tetramethylbutane and octane were also found.

German glue: this glue also contains a mixture of C_7-hydrocarbons (trimethylbutane, methylhexane, heptane, ethylcyclopentane, dimethylpentane and isopropylcyclobutane) with a high proportion of n-heptane as principal solvent. Additionally, the C_6-alkane 2-methylpentane, hexane and propylcyclopropane, the C_8-alkane dimethylhexane, and aldehyde (hexenal) and an unsaturated hydrocarbon were detected.

According to a study published by the Federal Institute for Risk Assessment dated 15.04.2004 [2], the following are currently used: cyclohexane, heptane and isomers (see above), the organic ester n-butylacetate and ethylacetate, and also hydrocarbons such

as special grades of petroleum spirit, naphtha (petroleum) hydrotreated light, and hydrocarbon solvent (aliphatic), not specified through citation of a CAS number.

1.1. Classification of organic solvents

The organic solvents can, essentially, be subdivided into four groups:

- aliphatic hydrocarbons
- esters
- aromatic hydrocarbons
- halogenated hydrocarbons

1.2. The current ITTF regulation on approved glues

According to a communication from the ITTF Equipment Committees dated 8.10.2004, the following solvents are currently not permitted:

- aromatic hydrocarbons
- halogenated hydrocarbons
- n-hexane

We do not wish to embark on any discussion about aromatic and halogenated hydrocarbons as they are already banned.

N-hexane is an aliphatic hydrocarbon and we cannot understand why it is not approved when all other aliphates are permitted. The potential risk of these substances is essentially similar. See further discussion below.

1.3. Material safety data sheets and the risk potential

Under the terms of Germany's Chemicals Act, ChemG, and the Hazardous Substances Ordinance, GefStoffV, all organic solvents belong to the category of hazardous substances. All manufacturers of such substances must enclose a so-called material safety data sheet (MSDS) when supplying such substances. A material safety data sheet must accompany every shipment. These data sheets contain every product-related notice, particularly any relating to health risks and toxicology. Material safety data sheets concerning organic solvents can be found in [3].

We have worked systematically through the material safety data sheets for organic solvents and have made the following findings:

<u>Aliphatic hydrocarbons</u>

The material safety data sheet of the principal components of n-heptane can be found in Annex (a).

Like the isomeric C_7 hydrocarbons and the C_6 and C_8 alkanes, the preparation is highly flammable and harmful, is a skin irritant, and highly toxic for aquatic organisms (dangerous for the environment).

These substances irritate the skin, the vapours irritate the mucous membranes in the nose and the respiratory tract, and they can cause drowsiness and dizziness. People exposed to higher concentrations may suffer from CNS depression, headaches, nausea, dizziness, confusion, behavioural disorders, inebriation, coordination disorders, cardiac rhythm disorders, disorders of consciousness and breathing difficulties.

Generally speaking it is true to say that aliphatic hydrocarbons containing 6-18 carbon atoms, if inhaled directly, can also cause pneumonia and sometimes even pulmonary oedema.

Details are provided about acute toxicity (LD50, LC50 values: these are values from animal experiments quoted in the MSDS's, explaining at what dosage of the respective chemical in the animal experiments 50% of the animals died a specified time

after ingestion) in relation to swallowing, inhaling and absorption through the eyes and skin. These are clearly toxic preparations. Hands and eyes must be protected when handling them (gloves, goggles). Contaminated clothing must be changed immediately.

When hydrocarbons are disposed of, certain disposal regulations have to be observed. It is special kind of refuse which falls into the "Hazardous waste" category (91/689/EG).

All these substances are subject to an "S02 notice": "Must be kept out of reach of children".

Esters

Compared with the saturated hydrocarbons, some of the organic esters also used are not directly classified as harmful in the sense of the hazard symbol X_n, but these substances also have toxicological threshold values in respect of oral and inhalational absorption above which 50% of the test animals died. Esters irritate the skin and the mucous membranes. Due to their frequently high vapour pressure (e.g. ethyl acetate), a harmful concentration in respiratory air is reached rapidly. In places where there are high concentrations (gluing rooms!), a narcotic effect can be generated. Esters also have the major disadvantage of being extreme odour pollutants, as they smell very strongly even in low concentrations.

Overall assessment of currently approved organic solvents

All organic solvents are fluids which may differ in their toxicity but, notwithstanding their actual classification, they are all toxicologically effective.

A study carried out by Germany's Federal Institute for Risk Assessment (or BfR) [2] investigated not only esters but also alkanes and cycloalkanes in terms of potential risk if used as speed glues. The following recommendations were made as a result:

1. Gluing rooms should be equipped with ventilation devices.
2. Gluing should only be permitted in the open air.
3. Children should be banned from gluing.

When asked, the BfR confirmed to us that these recommendations apply not only to the three substances investigated (butylacetate, n-heptane, cyclohexane) but also to all other organic solvents, to which even more stringent restrictions would be applied (e.g. benzene, toluene). There are no organic solvents that are not harmful to a greater or lesser extent.

4. Statutory provisions in Europe regulating the handling of harmful substances

4.1. Speed glue must be kept out of reach of children

The Chemicals Act is harmonised throughout Europe and applies to the whole of the EU. Within the category of chemicals, organic solvents are classified as hazardous substances. The categorisation and handling of these substances is regulated in Germany by the Hazardous Substances Ordinance GefStoffV.

Speed glues are preparations based on hazardous substances. According to Section 4 Subs. 1 GefStoffV, preparations are conglomerates, mixtures and solutions comprising 2 or more substances and which display at least one of the following hazardous features. We compiled these features in the following table, taken from the MSDS's of a number of organic solvents:

	Feature	Applies to speed glues and/or organic solvents present in speed glues
1.	explosive	no
2.	oxidising	no
3.	extremely flammable	some
4.	highly inflammable	all
5.	inflammable	generally in fact highly inflammable (Class 4)
6.	highly poisonous	no
7.	poisonous	no
8.	harmful	mostly
9.	caustic	no
10.	irritant	some
11.	sensitising	no
12.	carcinogenic	no
13.	toxic to reproduction	no
14.	mutagenic	no
15.	environmentally dangerous	mostly

Table 1. Preparations displaying at least one of these 15 features are hazardous.

In Germany, a set of guidelines entitled TRGS 200 [technical guideline for hazardous substances] [4] provides information about the categorisation and labelling of such substances. The TRGS is published in Germany by the Hazardous Substances Committee of the Federal Institute for Occupational Safety and Health.

Paragraph 6.16 of TRGS 200 deals with preparations obtainable by anyone and states that preparations containing organic solvents must always bear the warning notice:

“MUST BE KEPT OUT OF REACH OF CHILDREN”.

One of the above criteria must be fulfilled in order for this to apply. We did not find a single organic solvent which failed to fulfil at least one of the hazard criteria.

The possible consequences of this for parents, trainers, table tennis dealers, clubs and associations right up to the ITTF itself do not fall within the remit of this report.

The harmful and toxic character of organic solvents has given rise to a series of statutorily prescribed notices on the packaging used for speed glues. These are known as R (risk) and S (safety) clauses.

In the case of n-heptane, taken here as an example (see MSDS in Annex (a)), the following notices must appear on the packaging:

- highly flammable
- irritates the skin
- harmful: possible lung damage if swallowed
- vapours may cause drowsiness and numbness
- highly poisonous for water organisms; may have harmful effects on water supplies in the longer term.

All organic solvents must carry a set of similar warnings on the product packaging.

4.2. The MAK value and the Youth Employment Protection Act

When the hazard levels occasioned by speed gluing need to be measured, the so-called MAK value is frequently quoted. This is a concept from the world of employment. The

MAK value indicates the maximum permissible concentration of hazardous substances in the workplace.

The MAK values of all known hazardous substances are listed in the TRGS 900 [5]. When quoting these values, it must be noted that special protection conditions are specified for children and young people in Germany's Youth Employment Protection Act JArbSchG. The permissible levels for children and young people under the age of 18 are stipulated as follows in Section 22: "Young people may not be employed.....in positions in which they would be exposed to the harmful effects of hazardous substances within the meaning of the Chemicals Act". This is the case with speed glues. According to JarbSchG Section 22, the application of MAK values is only relevant for young persons subject to the proviso that such exposure is necessary for educational purposes and then only if the supervisory services of a technical specialist are provided for their protection.

It must be asked to what extent the practice of children and youngsters playing table tennis can be equated with the exercise of a profession. The answer to this question provides an indication as to whether applying MAK values is helpful and whether or not the provisions of Section 22 JArbSchG are relevant. A further question must also be answered: the question of whether it is necessary for young people to use speed glue and whether it can be ensured that speed gluing is always carried out under the supervision of an expert. Providing answers to these questions falls outside the remit of this report.

5. Estimated formation of explosive solvent-gas mixtures through the use of speed glues

During speed gluing, quantities of solvent vapour are released, which are sometimes quite considerable. The question arises as to whether such mixing with air can produce an explosive gas mixture. The so-called lower explosive limit indicates how much solvent must be mixed with air in order to produce an explosive mix. In this part of the study, consideration was given to the circumstances in which solvent-air mixtures causing an explosion can be produced through the use of speed glue. The problem associated with exceeding the lower explosive limit is well known in the glue industry. In the past it has resulted in serious accidents.

In order to be able to carry out a model flashover calculation, various facts were assembled and one or two assumptions made.

Explosive concentration:
The material safety data sheets applicable to the solvents used in the speed glues show that a risk of explosion exists where there is a weight proportion of solvent to air of between 1% and 2%, depending on the substance involved. For our purposes, for the sake of simplicity, we used a figure of 1%.

Air density:
The density of air is 1.29 kg/m^3 or 1.29g/l.

With solvent quantities released during speed gluing:
In a strong speed gluing process, standardised for laboratory purposes, 8.5g of glue is applied to the reverse side of the rubber; before it is applied to the blade, 6.5g of this evaporates and can still be found in the ambient air in the vapour phase.

Usual container sizes:
Table tennis players normally use glue containers with a capacity of 275ml and therefore a content of some 200g.

Volume of a car interior:
The interior volume of a car is estimated to be $3m^3$. Even though speed gluing in cars could theoretically be banned immediately in Germany by the DTTB, the model calculation for speed gluing in a car was still carried out, by way of a worst-case-scenario. Since such an explosion would constitute a very serious accident, a scenario where the rules are ignored must also be investigated.

Results of the flashover calculation for speed gluing in a car:

6.5g of solvent evaporates. A volume of 500 litres would be explosive.

If evenly distributed within a car interior, there will be a solvent concentration of 0.17%.

The quantity of speed glue needed to produce a 1% explosive air-solvent vapour mixture in a car interior, given even distribution, is 40g. This quantity corresponds roughly to the simultaneous speed gluing of 6 rubbers, in other words 3 bats, inside the car.

40g of glue corresponds to 20% of the contents of one speed glue container.

Conclusions:

In a one-off standard speed gluing procedure carried out on one side of the bat in a small space such as a car interior, the concentration of solvent released, given even distribution of the vapours in the car interior, is not sufficient by a factor of 6 to produce an explosive mixture.

However, these circumstances can easily change if several rubbers are glued at the same time. If 6 rubbers are treated simultaneously (a finished bat comprising two rubbers), the total quantity of gas in the interior can be transformed into an explosive mixture. This scenario may appear to be an unlikely one. However, this is a worst-case-scenario in terms of explosion. Even in such unlikely conditions, no such explosion may occur.

But there is a further danger since an even mix cannot be expected to form immediately in the car interior. An explosive mixture may form in a particular area, and an explosion might be caused there through contact with an ignition source (e.g. a cigarette).

There is also a danger that carelessness (e.g. tipping the glue container over) may result in enough solvent being released to change the air in the car interior into an explosive mixture. The leakage of 40g, or 1/5 of the content of a glue container, would be enough to produce an explosion if there were to be contact with a spark.

This scenario illustrates that, when speed gluing in restricted spaces, there is a potential risk in exceeding the lower explosive limit that has hitherto been virtually ignored and which deserves more investigation.

6. Glue sniffing and speed gluing

In its issue dated 1.3.2000, the magazine "*Phänomen Farbe*" reported: "Roland Schulz, Human Resources Director of Henkel KgaA, signalled recently that ethical responsibility would become a central theme in the years to come. Rules and self-regulation, would be needed, as free economic forces would otherwise produce distortions. A practical example of this new orientation, he said, was the replacement of solvent-based glues with water-based products. This decision was also taken because children were getting hold of glue in order to sniff solvent."

The North Rhine Westphalian Regional Co-ordination Office for Addiction Prevention describes the procedure for glue sniffing like this: "Addicts pour the liquid into a plastic bag or onto a handkerchief and inhale the gas. In this way the solvent gets into the bloodstream very quickly. After just a few seconds a brief inebriation period starts. If this process is repeated frequently *(sniffing, inhalation)*, the inebriation periods can be maintained for hours at a time."

Intake of these substances directly through injection *(intravenously)* or swallowing *(orally)* would result in life-threatening poisoning. Because of their chemical composition, the substances that have entered the body are deposited primarily in the fatty brain tissues and in the nerve fibres.

Since there is no data available regarding any direct connection between speed gluing and glue sniffing, the topic lies outside the ambit of this study. The authors were concerned only to look at some of the literature written about glue sniffing in order to establish whether this is a negligible phenomenon or one which is relevant to the current practice of speed gluing in table tennis and must be considered seriously.

Glue sniffing in Europe
In 1999, ESPAD (European School Survey Project on Alcohol and other Drugs) [5] presented a study in which children attending European Schools in 30 countries were systematically questioned about their use of drugs. The study included inhalants and sniffing. The respondents were asked whether they had ever sniffed inhalants. The answers can be seen in Table 2.

Country	% of respondents
Bulgaria	3
Croatia	13
Czech Republic	7
Denmark	7
Estonia	7
Faroe Islands	5
Finland	5
France ..	11
FYROM	4
Greece	14
Greenland	19
Hungary	4
Iceland	11
Ireland	22
Italy	6
Latvia	6
Lithuania	10
Malta	16
Norway	6
Poland	9
Portugal	3
Romania	1
Russia (Moscow)	9
Slovak Republic	7
Slovenia	14
Sweden	8
Ukraine	8
United Kingdom	15

Table 2 The table gives the percentage of students in the respective countries who admitted, when asked, that they had taken inhalants at least once.

In Croatia, France, Greece, Greenland, Iceland, Ireland, Lithuania, Malta, Slovenia and England an average of over 10% had sniffed inhalants at least once.

Glue sniffing in the Third World

The South American website disinfo.com [6] estimates that of the 40 million homeless children in South America, 50%, or 20 million, are dependent on glue sniffing.

The website of CWIN [7], a Nepalese children's rights organisation cites a similar figure of 52% for Nepal. It describes glue sniffing as a beginner's drug, which often leads on to hardcore drugs.

The Asian Human Rights Commission [8] does not cite any specific figures, but describes glue sniffing as an ever-increasing problem in Thailand, Indonesia, Cambodia, Malaysia, Pakistan, India and the Philippines.

We found similar comments regarding Pakistan and Afghanistan. See list of websites [9] [10].

As stated at the outset, the authors do not believe it to be their task to evaluate the facts found. This is up to the ITTF and the national associations.

7. Speed gluing and the environmental charter of the IOC, the International Olympic Committees

Table tennis is part of the Olympic Movement. It is no longer possible to imagine the sport without such Olympic Movement participation.

On the occasion of the 3rd World Conference on Sport and the Environment in Rio de Janeiro in October 1999, the Olympic Movement's Agenda 21 [11] came into force. This regulates the position of the Olympic Movement on sport and environmental issues.

One of the sections in Agenda 21 concerns itself directly with the position of the Olympic Movement on the use of harmful products. Here is the original text:

3.2.9 Management of hazardous products, waste and pollution

In most human activities, potentially hazardous products may be used and waste and, sometimes, pollutants, are produced. This is equally true of activities associated with sport. In order to avoid the lasting harmful effects which potentially hazardous products and wastes may have on the environment and human health, the members of the Olympic Movement undertake:

- *to avoid using products recognized as being hazardous or toxic to humans or environmentally polluting;*
- *not to encourage practices, manufacturing or agricultural techniques which require the use of such products;*
- *to minimize all forms of pollution, particularly noise pollution;*

Members of the Olympic Movement do not use any hazardous or toxic or environmentally harmful products. Speed glues based on organic solvents are damaging to health, toxicologically effective and environmentally harmful.

At this point, we wish to reiterate that it is not our task to make any evaluation. It is important for us to elaborate further the Olympic Movement's view on the use in sport of products that are damaging to health. It is the task of the ITTF and the national associations to draw the correct conclusions from these facts.

Annex:
(a) N-heptane material safety data sheet

References:

[1] Tiefenbacher, Konrad & Durey, Alain
The Impact of the Table Tennis Ball on the Racket (Backside Coverings)
International Journal of Table Tennis Sciences No. 2 (August 1994), ITTF, ISSN 0966-9256
[2] Lösemittel in Frischklebern für Tischtennisschläger [*Solvents in speed glues for table tennis bats*]
www.bfr.bund.de/cm/252/loesemittel_in_frischklebern_fuer_tischtennisschlaeger.3550.pdf
[3] http://chemdat.merck.de/mda/de/index.html
[4] TRGS 200, Einstufung und Kennzeichnung von Stoffen, Zubereitungen und Erzeugnissen [*Classification and labelling of substances, preparations and products*]
http://www.baua.de/prax/ags/
[5] TRGS 900, Grenzwerte in der Luft am Arbeitsplatz "Luftgrenzwerte" [*Threshold limit values in workplace air "Air threshold limit values"*]
http://www.baua.de/prax/ags/
[6] http://www.espad.org/key_uk.html
[7] www.disinfo.com/archive/pages/dossier/id20/pg1/
[8] http://www.cwin-nepal.org/press_room/factsheet/glue_sniffing.htm
[9] http://acr.hrschool.org/mainfile.php/0106/28/
[10] http://www.dawn.com/2002/02/14/local3.htm
[11] http://www.cyc-net.org/today2003/today030728.html
[12] www.olympic.org/uk/organisation/commissions/environment/agenda_uk.asp