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EFFECT OF VOC GLUE ON TABLE TENNIS PLAYERS

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Effect of VOC Glue on Table Tennis Players

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Abstract – The purpose of this technical presentation is to describe how the tournament officials may check and measure that a racket is legal and does not release volatile solvent vapours. During a tournament the umpires, the referees and racket controllers contribute to an efficient inspection of the rackets.

The volatile solvents used to prepare racket 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.

The instrument that ITTF use to detect such volatile solvents is Mini RAE Lite®, developed by RAE Systems, a worldwide known company expert in chemical and radiation detection. Mini RAE-Lite is a photoionization detector (PID) which uses ultraviolet (UV) light source of electron volts to break down chemicals to positive and negative ions (ionization) that can easily be counted with a detector.

This device shall be used together with a special cap connected by two Teflon tubes to the Mini RAE-Lite. The tolerance for VOC is 3.0 ppm. It is the responsibility of each player to ensure that racket coverings are attached to their racket blade with adhesives that do not contain harmful volatile solvents.

INTRODUCTION:-

Table Tennis is an individual game in which a various strokes are performed at high velocity. Table Tennis is known around the world as the one of the fastest ball game. With the development of table tennis equipment, modification in laws & regulations and techniques of play, ball speed and spin have increased to a great extent, which shortens the rallies for each point. This is not what table tennis was in the past.

Equipments & accessories in table tennis play an important role in enhancing the performance of a player. Rackets are much more interesting of table tennis accessory since they are more personal than other items of equipment. In 1990's, the "Gluemania" came into existence and table tennis rackets have greatly affected the speed and spin of the ball, the style of play as well as the level of performance of players. With the advent of technology, the use of table tennis rackets has become significant. Volatile Organic Compounds have been present in 'speed glues', the chemical reaction having the effect of providing greater speed and spin when contact is

made with the table tennis ball. At present, table tennis has become a fast-paced game that different proposals were being addressed by many for it to be slowed down in terms of the speed and spin of the ball.



Player applying speed glue in order to maximize speed and spin (Courtesy ITTF)

1st September 2008 is the date agreed by the ITTF Board of Directors at the 2006 Liebherr World Team

Championships in Bremen, Germany when the use of glues, which contain Volatile Organic Compounds (VOC's), will no longer be allowed for affixing racket coverings to blades. Reasons were as follows:

- 1} **Greater Health Risk:** Glues that possess Volatile Organic Compounds present a greater health risk than those that are water based. Players are exposed to Volatile Organic Compounds each time they glue and to some extent throughout training or match play, potentially this can endanger health. In the short term migraine, nausea, fatigue and a loss of co-ordination were possible results of over exposure to glues containing Volatile Organic Compounds while in the long term, the central nervous system could be affected and breathing problems may occur. The volatile solvents may harm our health in following 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.
- 2} **Excessive Rapidity:** "Gluemania" greatly affected the speed and spin of the ball, the style of play as well as the level of performance of players. Speed glues provided greater speed and spin, which decreased the number of rallies and attractiveness of table tennis.
- 3} **Doping:** Glues with organic and inorganic volatile compounds also contain some levels of toxicity, which influence the players negatively or positively. The over exposure to the use of glue made the player addicted of it.

PROCEDURE TO CONTROL RACKETS:

In order to increase the attractiveness of table tennis, the International Table Tennis Federation (ITTF) has carried out reforms which include the prohibition of glues containing harmful volatile organic compounds being controlled through racket testing.

Racket Control is the procedure to test whether a racket complies with the Laws of Table Tennis. Rackets are checked that they are legal or not. It measures the legitimacy of racket which does not release volatile solvent vapours, except water.

The process of racket testing interferes as little as possible with the preparation time of the players just before the match and it does not delay the start of a match. The instrument that ITTF use to detect such volatile solvents is MiniRAELite®, developed by RAE Systems, a worldwide known company expert in chemical and radiation detection.

MiniRAE-Lite is a photoionization detector (PID) which uses ultraviolet (UV) light source of electron volts to break down chemicals to positive and negative ions (ionization) that can easily be counted with a detector.



(Courtesy ITTF)

This device shall be used together with a special cap connected by two Teflon tubes to the MiniRAE-Lite, which reads background level initially and then after 20 seconds and attains Real Reading.

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).

Penalties Applicable For Racket Control Failure Regarding VOC

- Disqualification from the individual match for any first failure in an after-match test.
- Disqualification from the individual or team match where a player fails two times at any time.
- Disqualification from the tournament where a player fails three times at any time.
- Following 4 accumulated failures on any aspect of compulsory racket testing over a 48-month period, a player shall be suspended for 12 months from participating in ITTF events.

DISCUSSION:

Table tennis is a sport played by millions of people around the world, in more than two hundred national associations, it has got a strong and wonderful image. If we want to keep this beautiful image, the materials and substances used to play it must be totally harmless and from an ethical point of view all players must fight with the same kinds of weapons. It is the responsibility of each player to ensure that racket coverings are attached to their racket blade with adhesives that do not contain harmful volatile solvents. However, the ITTF's current "Racket Control" programme and protocols will continue controlling the amount of VOCs in a racket in order to protect the health of the players and to make the game more attractive with increasing the number of rallies. This is also supported by the study done by Michail Katsikadelis, Theofilos Pilianidis and Alexandra Misichroni of Hellenic Table Tennis Federation, Greece on "**Comparison of Rally Time in XXIX Beijing (2008) and XXVIII Athens (2004) Olympic Table Tennis Tournaments**".

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