

Recent problems with equipment

J. Rufford HARRISON

Former chairman, ITTF Equipment Committee, Washington NH, USA

Abstract This paper discusses several problems that currently face the Equipment Committee.

Balls: The problem of changing from the 38mm ball to the 40mm is largely behind us, but for some months, until the manufacturers perfect their changed techniques, we cannot expect the quality that we have come to expect in the 38mm ball.

Tables: We have recently received complaints about deteriorating and variable quality of tables, largely associated with friction. Of all the properties of the table, this happens to be the most difficult to measure. We shall probably have to develop dynamic tests, which will be more costly.

Racket coverings: Both the Executive Board and the Council have expressed displeasure at the large number of authorised racket coverings, and we have been asked to find a way to shorten the list. Several possible ways are presented.

Speed glue: When "speed glue" was first introduced, it contained solvents that were toxic, even possibly carcinogenic. We therefore had to devise tests to detect the offending solvents, and to place upper limits on the permissible concentrations. The resulting Dräger-tube method is fairly simple to operate, and not too costly, but it does have problems. Detecting any solvent is far easier than detecting certain specified ones. Our preferred solution is to ban the presence of any solvent.

Colour and lighting: Another task that we have been given is to prescribe the optimum colour scheme for our sport, for both TV viewers and those in the hall. Orange or white ball? Blue or green table? Red floor or some other colour? Net? Surrounds? A difficulty here is the lighting, which is always different from one event to another, and which affects the perceived shade of a colour and the amount of haze.

(Key words: equipment problems)

1 The 40mm ball

All the major manufacturers are now making the larger ball, of which more than sixty brands have now been tested and approved. Before discussing this new ball, however, let's start with some history of the 38mm ball, which was used for three quarters of a century.

In 1959, when I first became involved with the ITTF, the ball was much softer, more uneven, and more variable than in recent years. Players routinely applied two tests when selecting balls before the match: First, they squeezed the balls between finger and thumb. The only result of that today is likely to be bruised fingers, but forty years ago it revealed which balls had halves of different hardnesses – it was sometimes possible to indent the ball deeply. Second, they would spin it on the table, and would see that many of the balls would wobble; we called them eggs. These two tests resulted in many rejected balls, even though they had been approved by the ITTF. The explanation was simple: The ITTF tested only balls submitted directly by the suppliers; not surprisingly, they were always very good. Furthermore, the ITTF's tests did not include hardness, and the regularity of a property was never tested, only its conformity to regulation.

Since that time we have gradually tightened our specifications, and we have added regularity. For instance, the ball had to weigh between 2.40 and 2.53 g; if a 24-ball sample conformed to that specification, it was considered to be acceptable. The ITTF didn't mind what the weight was, provided that it was within that range. Not so today: we demand that all balls within the sample are similar; in the 38mm days we didn't want 2.40g balls to come out of the same box as 2.53g balls. We therefore established a maximum standard deviation for the weight, and did the same for size, bounce and veer. Then we added tests for sphericity and hardness. As our tests and specifications gradually became more exacting, and the manufacturers gradually improved their techniques, the quality of the balls improved over the years.

But now we have the new, 40mm ball, and the appropriate manufacturing techniques have not yet been perfected. It won't take decades, of course, but don't expect miracles. The manufacturers are making what appear to be satisfactory balls, but they still have work to do. And keep in mind that our first approval tests were done with balls sent to us by the suppliers, since there were none yet in the marketplace. I.e., they were only a few days or weeks old. But the balls that we normally test are taken randomly from the market, and the turn out to average about two years old. As I write this paper, we are in the middle of only our first set of random tests, and we don't yet know how the 40mm balls will age.

2 Tables

We have recently received complaints about the deteriorating and variable quality of approved tables, stemming, it seems, from too low a coefficient of friction (COF). One problem here is that COF is not a property of a surface; it is a property of two surfaces in contact, in our case paint and celluloid, neither of which is specified. We test it by rubbing celluloid across the table surface in a room with controlled temperature and humidity. But it is not unlikely that the same brand of table could be used this week in Oslo and next week in Lagos, with very different atmospheric conditions; some halls are air-conditioned, and some are not. Temperature and relative humidity (and dust) all have strong effects on COF. Another complication is that we measure COF (and bounce, too, which has its own problems) at low speed and with no spin. I.e., our tests do not mimic

what happens in a fast game. We are therefore considering what dynamic tests we can do in order to get better information, and where those tests can be done. Only when we have designed suitable tests shall we be able to prescribe the desired COF.

3 Racket coverings

Lots of sports use what one might call a weapon. Ours, as in tennis, squash and badminton, is a racket. Fencing uses various types of sword. Boxers use gloves. Does any other sport have weapons with 670 types of approved coverings? We think not, and we have been requested to find a way to reduce that number. Several possibilities each have their pros and cons:

1. We could limit the suppliers to a maximum number of racket coverings (RC), say ten, thus reducing the number from 670 to about 350. But would it be fair to tell someone with, say, forty types of RC that he has to reduce this number by three quarters, while someone with ten coverings would be unaffected?

2. We could delete those that are not much used. For instance, in the Olympic Games and the Paralympic Games only about one hundred types of RC were used, and in the Pro Tour finals there were only about one quarter of that number. But the suppliers would have a ready way to circumvent such a restriction, simply by paying a player to use a particular type of RC.

3. We could limit certain properties of the RC, such as resilience (bounce), COF or elasticity. Simple tests can be developed that a referee could use. This would certainly achieve the objective, but it could be argued that these tests do not correspond with the conditions of play, since they would be essentially static. Furthermore, we'd have to measure every one of the 670 types of RC first, in order to determine suitable limits.

4. We could increase the authorisation fees for RCs. We currently charge a small fee for up to ten types, a larger fee for up to twenty, and a still larger fee for more than twenty. We could easily make that gradient steeper, but recent experience suggests that the steepness would have to be very much more than it is now.

The Committee is still considering these various possibilities.

4 Glue

Roughly a decade ago we warned the glue manufacturers that some of their products contained solvents that were toxic, but the manufacturers largely ignored our suggestion that they reformulate. Eventually, however, a Japanese table-tennis shop was raided by police, and their glues confiscated, forcing us to act more positively. The result is the current prohibition of three classes of solvent: aromatic (benzenoid) solvents such as benzene, toluene and xylene; halogenated solvents such as trichloroethylene; and n-hexane. This means that we have to test for each of these groups separately. The tests, using Dräger tubes, are fairly simple and not overly expensive, but the results are difficult to interpret,

and we invariably have a shortage of trained operators. Furthermore the test is complicated by solvent emitted by the RC itself; players are enjoined to air out their RCs but they do not always do it sufficiently early. A further complication is that the test gives false results if the ambient temperature is too high.

There is a simple solution to all these problems: We could ban all solvents. It is far easier to test for any and all solvents than it is to test for the three groups of banned ones. The device is fairly inexpensive, and is similar to the "breathalyser" used by police for measuring alcohol concentration. Council has asked the Committee to study this method further.

It should be noted that banning all solvents would not necessarily eliminate the effect obtained by "fresh gluing". The RC manufacturers are constantly developing products that yield more spin and speed. And the glue manufacturers are developing new products that could be applied to the racket several hours before play, resulting in a racket that exudes far less solvent than at present.

5 Colour and lighting

Although videos of recent Pro Tour events show good colour and contrast, this is not always the situation. For instance, viewers in some of the more preferred seats in Kuala Lumpur saw so much haze that the colour of the table was not identifiable.

Our goal is an attractive scene, both via TV and when viewed in the playing hall. Yet many events use green tables on the red floor, regardless of the fact that 8% of all human males, of all races, are red/green colour-blind — they see both red and green as shades of grey. This certainly cannot be very attractive.

Another problem is that, say, orange, blue and red may look wonderful in one hall, yet in another hall with perhaps mercury lights instead of halogen the colours may look quite different. We are giving thought to finding a good optical laboratory that can prescribe the optimum colour scheme for us.

These are just a few of the problems facing equipment today. They face us now only because conditions generally have improved over the years, and in addition we are more exacting. We want the best for our players, and we have to compete for air time against all the other sports. The Equipment Committee is becoming ever more technical and ever more busy.

6 Acknowledgements

I have had no assistance in writing this paper, but I do wish to record the invaluable help that members of the Committee have provided in particular Odd Gustavsen (the new chairman), whose home is largely devoted to the storing, cataloguing and measuring our hundreds of racket coverings; Dr. Joachim Kuhn who, after learning all about the 38mm ball, has worked with the manufacturers to develop the specifications for the 40mm ball; Dr. Keith Powell, who handles the analysis and resulting authorisation of the various types of glue; Paul Schiltz,

our man with three hats: he is in charge of tables, floors, and racket control at tournaments; and Nobuyuki Shirakawa, who has been doing much of that racket control. Without the selfless work by these people, there would be many more complaints about inferior equipment.