



TTX

**EQUIPMENT
MANUFACTURING
Technical Requirements**

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1. Introduction

WELCOME TO THE WORLD OF TTX!

TTX is an exciting new game, and a new form of sport!

TTX was born from the desire to make Table Tennis an inclusive, exciting and even more energetic sport. TTX is a time bound format of Table Tennis that is played with different equipment, so that it can be played anytime, anywhere. The TTX rules are also different from conventional Table Tennis and add a dimension of unpredictability to the game. TTX is fun, exciting, unpredictable, and you control the stakes with every serve. Every second counts in a game of TTX and things could change completely even at the very last moment.

The TTX community is for the people who love not just the game of TTX but also the spirit of TTX. The TTX community is made of a wide cross-section of people, young, old, coming from different cultures and different playing styles all united by the spirit of our sport.

How is TTX equipment different from conventional TTX equipment?

TTX isn't your typical game of Table Tennis. TTX is more than a sport – it's a lifestyle brand, and every aspect of the brand is carefully considered. It's important that our equipment is more than just functional – it should look cool, be desirable, and reflect the spirit of TTX. *For more information about the brand and the sport, please refer to the TTX Brand Style Guide contained in the appendix. Here you will also find a selection of designs, which can serve as inspiration and a starting point for 'on-brand' equipment graphic designs.*

We will be building a unique brand around the sport of TTX, and the equipment produced by our partners will play a very important role in this. There will be a lot more emphasis on ensuring that the technical specifications and the graphic design of any TTX-approved equipment is of a high-standard and quality. We have set-up a responsive approval process which will look at the technical and graphic design aspect of the proposal in detail, and as a valued partner, we will work with you to develop great designs with mass appeal.

If you like what you hear so far, then we'd love to have you join our community as one of our TTX Equipment Suppliers! Please read on.

This document describes the technical requirements and guidelines for TTX Equipment.

2. TTX Ball

Material	Any material (non-harmful and non-dangerous materials only)
Weight	5.00 g (Tolerance: 4.94 to 5.15g)
Diameter	46.00 mm (Tolerance: 46.00 to 46.75g)
Sphericity Conformity	< 0.32 for any ball
Bounce Conformity	260 – 280 mm when dropped from 305 mm
Hardness Conformity	0.44 – 0.60 mm of indentation under 50N load
Veer	No more than two balls shall deviate more than 175mm more than once after rolling three times for 90 cm.
Colour	Any colour (including multi-colour balls / up to 4 colours max)

BALL - QUALITATIVE CRITERIA AND APPEARANCE:

Our qualitative criteria will ensure that we’re creating one cohesive brand across the world, which will encourage the proliferation of the sport. Meeting these qualitative criteria are just as important to TTX, as passing our technical specifications.

a. Colour

- TTX is designed to be an inclusive sport, so almost any colour is a good colour! Please refer to our TTX Brand Guidelines for more information on our brand colour palette, and inspiration for your designs. A few restrictions:
- Use of multi-colour is allowed, however any multicolour balls must only have a maximum of 4 different colours.

b. Seam

Seamless balls and balls with seam are aligned with our criteria, however a maximum of only one seam is allowed.

c. Stamp, Textures, & Patterns

We have a set of patterns, textures, and verbal statements which can be found in the TTX Brand Guidelines (see appendix). Please use these as a starting point for any stamps, patterns and textures to be used in your equipment graphic designs, and we encourage you to stay as close to these as possible. Do get creative with your ideas, but remember that any designs **MUST** look and feel like they are part of the overall TTX brand. No offensive language or images should be used – we are an inclusive brand.

d. Packaging

We encourage you to embrace the spirit of TTX, and use the awesome brand assets we’ll supply to help you create some stand-out packaging for your equipment. Graphic design of your packaging is free-form and up to you, as long as it is cool, and is aligned our overall TTX brand image.

For regulations, please ensure you include a datecode of the production date on all packaging. The date code consists of 4 characters: the first 2 for the month and the last 2 for the year. Month and year are encoded using the capital letters from A to I for the numbers 1 to 9 (A = 1; B = 2; etc. up to I = 9; X = 0).

TTX EQUIPMENT MANUFACTURING - TECHNICAL REQUIREMENTS**Qualitative Assessment Method**

All submissions of graphic designs for TTX equipment will be assessed by the TTX Communications and Marketing Team. Submissions will be broadly assessed against the following criteria:

- Do the designs feel inclusive, open, and bold; do they appropriately reflect the spirit of the TTX brand?
- If using TTX Brand Assets, are the assets applied correctly as per the Brand Guidelines?
- Are the graphics well-designed, and visually appealing?

BALL - QUANTITATIVE CRITERIA:

We want to create a sport that will encourage mass participation. So like all great sports, we've got to standardize some things. Here come the numbers!

e. Number of balls for testing

Please send 30 balls, from which 24 balls are selected randomly for the testing purposes.

f. Conditioning

Consistency is key! We equilibrate balls at 23° ($\pm 1^\circ$) Celsius, 50% ($\pm 5\%$) R.H. for at least three days (standard conditions according to Class 1 EN ISO 291).

g. Weight

TTX balls have been specially designed to be heavier than conventional Table Tennis balls, thus ensuring that TTX can be played anywhere, anytime. This is super important, to ensure that the sport is enjoyed across the world.

Any one ball shall weigh 4.94 and 5.15 g.

h. Diameter

Any one ball shall have a diameter between 46.00 and 46.75 mm.

i. Sphericity Conformity

Any one ball shall show a (lack of) sphericity < 0.32 , and the sample mean shall show a (lack of) sphericity of < 0.25 .

j. Bounce Conformity

Keep our players' hopes up! All 24 balls must rebound to a height of not less than 260mm and not more than 280mm when dropped from a height of 305mm on to a standard steel block.

k. Hardness Conformity

The geometric mean hardness for any ball shall be in the range 0.44 – 0.60mm.

l. Veer

Oh dear! No more than two balls shall deviate more than 175mm from the center line after a rolling distance of 0.9 meters.

TTX EQUIPMENT MANUFACTURING - TECHNICAL REQUIREMENTS**BALL - TESTING METHODS**

Here's how we'll test future TTX balls to make sure that they're up-to-scratch.

m. Weight

Measured on an electronic analytical balance reading to 0.01g.

n. Diameter

Measured with a calibrated electronic device with a precision of at least 0.001mm which measures the diameter with a precision of 0.01mm.

o. Sphericity Conformity

By rotating the ball its minimum and maximum diameters are determined. The difference between the two values gives the lack of sphericity

p. Bounce Conformity

Measured by releasing the ball mechanically without spin. After its bounce on a standard steel plate the ball is monitored with a digital camera with a calibrated mm scale in the background. The photos are evaluated. The geometric mean of three determinations then permits calculation of the maximum height of bounce of the "south pole" of the ball. A standard steel plate is made of Steel S235 with a surface roughness of $R_a \leq 1.0 \mu\text{m}$ and $R_{\text{max}} \leq 7.5 \mu\text{m}$.

q. Hardness Conformity

The geometric mean hardness of two measurements for any ball shall be in the range 0.44 – 0.60mm. For balls with seam the measurements are made on the two poles, for seamless balls they are made on two random spots which are antipodes to each other. The values reflect the indentation (higher value = softer).

Measured on a Zwick tester (or equivalent). We use a preload of 0.5 N and testing starts 10 sec after preloading. A 20mm diameter pin presses against the ball with a 50 N force loaded at 10 mm/min, and the indentation is recorded with a precision of 0.01mm. The ball is supported by an annular ring whose upper inside surface slopes at an angle of 45 degrees. The outer diameter of the ring is 40mm and the inner diameter at the bottom of this slope is 20mm.

r. Veer

Measured by rolling the ball down a slight incline onto a horizontal surface, and measuring the distance by which it deviates from a straight line, the "centre line", as it rolls across the surface. The incline is 100mm long at 14 degree to the horizontal; on a table that is 100cm long this gives a rolling time of about 3 seconds. Each ball is measured three times. A negative result is reported if the ball fails the test twice. A "failure" is defined as the event that the ball is hitting one of the two "side lines" which run parallel to the center line in a distance of 175mm to the left and 175mm to the right.

The rolling surface is at least 20mm thick with a roughness of $R_a \leq 1.0 \mu\text{m}$ and $R_z \leq 7.5 \mu\text{m}$.

3. TTX Racket

TTX rackets are a super important part of the new game! These new rackets are specially designed to remove any spin from conventional rubber rackets, and it's where our players can feel the most difference between TTX and conventional Table Tennis. The rackets are intentionally designed to be lighter, and more affordable. We want our players to be able to personalize their equipment and reflect the diversity of the freestyle spirit behind our brand.

Material	Any (Single thermoplastic polymer recommended)
Racket coverings	Not applicable
Weight	Any
Size	Any
Shape	Any
Construction	Any
Hardness	Shore A hardness of >95 on the ball hitting surface
Deformation	Sufficient stiffness to withstand knocks and collisions during play without significant deformation or structural failure.
Static Coefficient of Friction	Maximum of 0.50, under a Normal Force of 1.39 N and a testing speed of 100mm/min, with a TTX ball as specified above.
Dynamic Coefficient of Friction	Maximum of 0.29, under a Normal Force of 1.39 N and a testing speed of 100mm/min, with a TTX ball as specified above.
Colour	Any colour (including multicolour rackets)*

RACKET - QUALITATIVE CRITERIA AND APPEARANCE:

Skaters, snowboarders, and surfers get pretty fanatical about the design of their boards, right? That's how we want TTX players to feel about their racquets. Like those other sports, TTX is a lifestyle and it's important that our equipment is more than just functional – it should look cool, be desirable, and reflect the spirit of TTX.

a. Modularity & Personalization

We encourage all our Preferred Partners to think about how their designs can be made to be modular and/or allow for personalization by the consumer. Examples include designs on the racket, different handle designs, clip-on covers, etc.

b. Colour

TTX is designed to be an inclusive sport, so almost any colour is a good colour! Please refer to our TTX Brand Guidelines for more information and inspiration on our brand colour palette.

c. Stamps, Textures, and Patterns

We have a set of patterns, textures, and statements which can be found in the TTX Brand Guidelines. These are a good starting point for any stamps, patterns and textures to be used in your equipment designs for production, and we encourage you to stay as close to these as possible. Do get creative with your ideas, but remember that any designs **MUST** look and feel like they are part of the overall TTX brand. No offensive language or images should be used. Stickers are also not encouraged as it may interfere with the performance of the equipment.

TTX EQUIPMENT MANUFACTURING - TECHNICAL REQUIREMENTS**d. Packaging**

We encourage you to embrace the spirit of TTX, and use the awesome brand assets we'll supply to help you create some stand-out packaging for your equipment. Graphic design of your packaging is free-form and up to you, as long as it is cool, and is aligned to our overall TTX brand image. Consider ideas such as re-usable packaging, and printed fabric drawstring/tote bags – anything that offers more of an 'experience' is a bonus!

RACKET - TESTING METHODS

Here's how we'll assess and test future TTX rackets to make sure that they're up-to-scratch.

- e.** Balls and rackets shall be tested in a clean state. Manufacturers and lab shall take care that no residuals of glue are left on the equipment.
- f.** Every ball in the sample of 24 shall be slidden once on each side of a racket.
- g.** For each and every of these measurements, Dynamic CoF shall not exceed 0.29 and Static CoF shall not exceed 0.50.
- h.** Important: Testing speed of 100 mm / min and Normal Force of 1.39 (or 1.4) Newton.
- i. Graphic designs for Limited Edition Equipment**

Should there be a desire to manufacture limited edition equipment for an event or licensed partnership deal (i.e. a full racket design), then the full approval process and testing methods do not apply if the limited-edition equipment meets the following criteria exactly:

 - i. NO MORE THAN 200 UNITS will be manufactured
 - ii. If producing a full racket, you are using a previously approved racket model that has already passed the technical specifications. The only change is the graphic design – all other specifications remain the same.
 - iii. As a Preferred TTX Equipment Partner, you are confident that the designs do not contravene the TTX brand, and accept full responsibility and fines for any issues arising from the design.

TTX EQUIPMENT MANUFACTURING - TECHNICAL REQUIREMENTS**4. TTX Table**

TTX is designed to be as fun to watch, as it is to play. The new rules make it a much faster paced game, and we hope that it will become as popular as conventional Table Tennis (if not more!). We want people to be able to play on any surface for the game (e.g. outdoor concrete tables), in the spirit of playing anytime, anywhere! For official TTX tables, the technical specifications remain the same as those for conventional Table Tennis, with more personality through the graphic designs.

TABLE – QUALITATIVE CRITERIA AND APPEARANCE:

We have a set of patterns, textures, and statements which can be found in the TTX Brand Guidelines. These are a good starting point for any stamps, patterns and textures to be used in your table designs, and we encourage you to stay as close to these as possible. Do get creative with your ideas, including neon lighting for play in dark, but remember that any designs **MUST** look and feel like they are part of the overall TTX brand. No offensive language or images should be used.

a. Colour

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b. Stamps, Textures, Patterns, and Stickers

We have a set of patterns, textures, and statements which can be found in the TTX Brand Guidelines. These are a good starting point for any stamps, patterns and textures to be used in your equipment designs, and we encourage you to stay as close to these as possible. Do get creative with your ideas, but remember that any designs **MUST** look and feel like they are part of the overall TTX brand. No offensive language or images should be used.

TABLE – QUANTITATIVE CRITERIA

- c.** The upper surface of the table, known as the playing surface shall be rectangular, approximately 2.74m long and 1.525m wide, and shall lie in a horizontal plane approximately 76cm above the floor.
- d.** The playing surface shall not include the vertical sides of the tabletop.

TTX EQUIPMENT MANUFACTURING - TECHNICAL REQUIREMENTS**5. TTX Net****NET – QUALITATIVE CRITERIA & APPEARANCE**

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a. Colour

- TTX is designed to be an inclusive sport, so almost any colour is a good colour! Please refer to our TTX Brand Guidelines for more information on our brand colour palette, and inspiration for your designs. A few restrictions:

b. Stamp, Textures, & Patterns

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NET – QUANTITATIVE CRITERIA

- d. The net assembly shall consist of a net, or any other material, which helps to separate the table into two halves.
- e. The top of the net or wall, along its whole length, shall be 15.25cm above the playing surface.
- f. The bottom of the net or wall, along its whole length, shall be as close as possible or connected to the playing surface and the ends of the net shall be attached to the supporting posts from top to bottom.

NET - TESTING METHODS

For nets we will only have a basic check of quantitative criteria.

TTX EQUIPMENT MANUFACTURING - TECHNICAL REQUIREMENTS**6. TTX Approval Levels****TTX Balls – STELLAR**

Balls which meet all requirements fully.

TTX Balls – SOLID

Balls, which all samples tested pass minimum the X2 = 50 – 75 cm in veer test.

TTX Rackets – STELLAR

Rackets which meet all requirements fully.

TTX Tables – STELLAR

All currently ITTF Approved Tables are immediately eligible for TTX Approval, but a separate approval is required and approval may be refused under certain conditions.

TTX Nets - STELLAR

Nets which meet all requirements fully.