



Introduction

At present, net gauges are not applicable equipment for approval by ITTF. Nevertheless net gauges have a very important role to keep the matches fair such that:

- (i) the result of a rally should not be influenced by the net condition or
- (ii) a net gauge can indicate illegality of players' racket.

Net gauges can also be used for the detection of glossy surfaces of rubbers.

Therefore the ITTF intend to regulate the specifications or requirements of the net gauge as "Technical Guidelines". Umpires should use only a net gauge conforming to the requirements described in this "Technical Guidelines" document. The responsible person should check the capability of umpires' net gauges, not only for using as a net gauge, but also when it will be used as a tool for Racket Control, before starting the tournament.

Two types of net gauges are wholly used by umpires:

1. **Light net gauges:** They are to be used for the adjustment of the height of the net, at about 30cm from the net posts.
2. **Heavy net gauges:** They are to be used exclusively for the adjustment of the net tension, in the middle of the net. This cannot be used for adjusting the net height.

Additionally to the above functions of the net gauge, a light net gauge may often be used to check the extensions, flatness and thickness of the rubbers on a player's racket as well as the height of the cushions of the wheelchairs.

Terms of reference

A. Net height and net tension:

1. Law 2.02.03: The top of the net, along its whole length, shall be 152.5mm above the playing surface.
2. Technical Leaflet T2 - The Net Assembly:
 - 2.1. The tension of the net cord may be checked in the middle of the table either by using fingers or, preferably, by a 100g **heavy tension gauge**. The 142.5mm high part of the gauge should hang on the net; the tension is correct if the bottom of the gauge comes next to the table-top surface without touching it. Otherwise the devices to adjust the net tension must be operated.
 - 2.2. The height of the net shall be checked about 30cm from the upright posts: it shall reach the correct height. The height should preferably be adjusted with the normal **light net gauge** that does not depress the net: the bottom of the freely and vertically hanging gauge should just touch the table-top. Otherwise the devices to adjust the net height have to be operated until the 152.5mm are reached everywhere.

B. Rubber thickness, flatness and extensions

1. Law 2.04.01: The racket may be of any size, shape or weight but the blade shall be flat and rigid.
2. Law 2.04.03: A side of the blade used for striking the ball shall be covered with either ordinary pimped rubber, with pimples outwards having a total thickness including adhesive of not more than 2.0mm, or sandwich rubber, with pimples inwards or outwards, having a total thickness including adhesive of not more than 4.0mm.
3. Law 2.4.4: The covering material shall extend up to but not beyond the limits of the adhesive on a side used for striking the ball shall be continuous and of even thickness

C. Wheelchairs

The height of one or maximum two cushions is limited to 15cm in playing conditions with no other addition to the wheelchair, as indicated in the Directives for PTT Events, page 7, point 3.15.3.



The requirements for net gauges

All net gauges may have a height of about 180 mm. Their width shall be less than 48 mm (heavy gauges) and less than 42 mm (light gauges) but slimmer is better. Their thickness shall be 2.0mm so that they can be used for determining the extension of the racket covering up to or beyond the edges of the blade as recommended in HMO 7.1.1. As net gauges can also be used for the detection of glossy surfaces at an angle of about 45°, their background may be dark and letters or logos may be white. There are no rules for advertisements on the net gauges, other than **the ITTF logo shall only be used for net gauges that have been approved by the ITTF**. Along one of its edges the net gauge shall have a ruler of 15cm scaled in mm so that it may serve for measurements as the height of the cushions of wheelchairs. Figures 3 & 4 draw basic shapes for net gauges used at ITTF tournaments. Other features may be added but may not change a basic requirement as described in Table 1 and in the text.

The design of a net gauge shall allow it to hang vertically on a cord. If it does not, the centre of gravity of its plane is located outside its medium vertical axis, which may lead to incorrect measurements because the lower part of the gauge will touch the net. For the same reason, the central split may not be narrower than 7 mm.

On one side the net gauge shall have an incision of 4.0 mm with a tolerance of +/- 0.05mm, and on the other side it may have an incision of 2.0mm with a tolerance of +/- 0.05mm. The angles of the projecting part at the top of the incisions must be 90° exactly and rounding on the outside or inside corners is strictly prohibited. The height of the lateral incisions shall not be less than 152.5 mm, so that both long edges can be used for flatness checks. All relevant dimensions shall be properly indicated on the gauge.

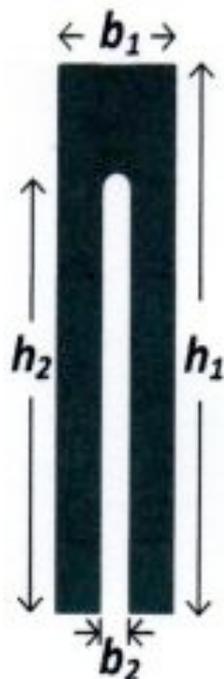


Figure 3: Basic net **tension** gauge

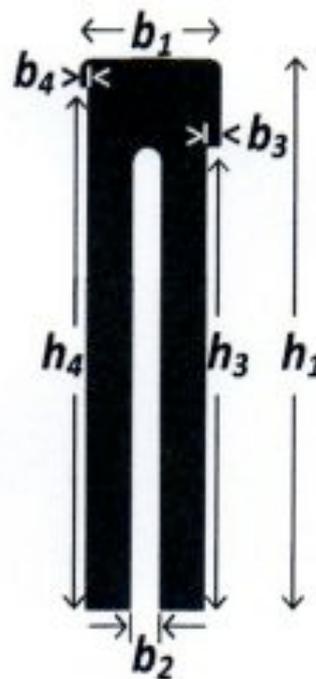


Figure 4: Basic net **height** gauge



Table 1. Requirements for features, dimensions and design of net gauges

Net gauges		Figure	Heavy gauge	Light gauge
Functions			net tension & racket covering	net height & racket covering
Lateral incisions for racket covering thickness		4	optional	compulsory (both incisions)
Overall maximum width		3 & 4	$b_1 = 48$ mm	$b_1 = 42$ mm
Overall height		3 & 4	$h_1 =$ approximate 180 mm	
Overall thickness			2.0mm +/- 0.1mm	
Weight			100.0 ± 0.5 g	< 15 g
Height of central split (exactly!)		3 & 4	$h_2 = 142.5$ mm	$h_3 = 152.5$ mm
Width of central split		3 & 4	$b_2 < 12$ mm, preferred b_2 7- 8 mm	
Depth of lateral incisions if any		4	$b_3 = 4.0$ mm and $b_4 = 2.0$ mm	
Height of lateral incision	for 2 mm depth	4	$h_4 = 152.5$ mm or 172.5 mm	
	for 4 mm depth	4	$h_3 = 152.5$ mm	
Roundness of	central split top	3 & 4	rounded	straight
	lateral incision top	4	straight	straight
	corners on top of the lateral incision	4	90° sharply, strictly no rounding	90° sharply, strictly no rounding
Sides of	lateral incision	4	straight, strictly no convexity or concavity	
Recommended colour			background: dark; lettering: white	

If the responsible person confirms that a net gauge satisfies all the requirements shown in table 1, he/she gives the approval to the supplier to use the ITTF logo and the manufacturing date on the net gauges. The approval is only valid for the specific manufacturing series and any changes for future manufacturing series should first be approved by the ITTF.

The market presently provides heavy gauges with a central split, open up to 15 mm, for the height. As long as the heavy gauge can hang vertically and safely on the net for the height of 142.5 mm, its central split is acceptable for the tension adjustment (but should not be used for the height adjustment). Lateral incisions are not made for tension adjustment; height adjustments are possible but they are fussy and questionable. Therefore, lateral incisions may not be used for adjusting the tension or the height of the nets. Lateral edges must be straight because gauges are used for the check of thickness and flatness of the rackets.

Example of the heavy net gauges in the market

142.5 mm and 152.5 mm or



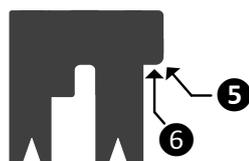
142.5 mm and 162.5 mm.



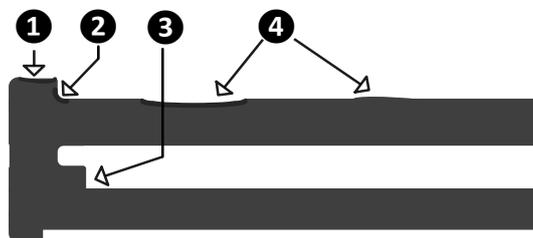
Figure 5: Gauge hanging vertical on a cord

Gauges showing any of the following defects shall not be used, because they do not allow:

- correct, safe or quick determinations of the tension of the net: ③
- reliable checks of the thickness of racket coverings: ① ② ⑤ ⑥
- correct checks of the flatness of racket sides: ② ④



Strictly prohibited defects
 ⑤ = rounded outside corner at the top of a lateral incision
 ⑥ = lateral incision depths different to 4.0 or 2.0 mm



Defects which are not acceptable
 ① = edge not straight
 ② = inside corner rounded
 ③ = top of the tension split straight
 ④ = edge not straight

Figure 6: Strictly prohibited defects of net gauges

Figure 7: Prohibited defects of net gauges

How to check the correctness of net gauges based on the requirements

1. A vernier caliper, a large size, 200 mm, is recommended for checking each dimension of a net gauge.
You can buy it at any tools shop. You don't need to select a high precision one.
2. Easy method for checking the net gauge by using metal pins.
The accuracy of the diameter of the metal pins should be 3.95 mm ~ 4.00mm.

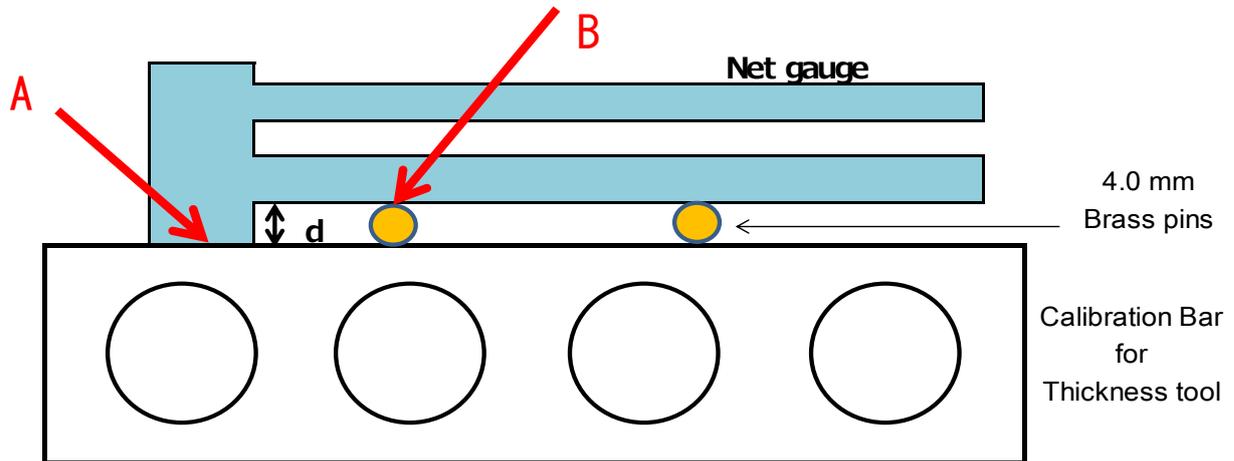


Figure 8: Easy Method for checking the net gauge, by using metal pins

- 1) d of net gauge ≤ 4.0 mm → any gap will be found at A (tolerance ≤ 0.1 mm)
 - 2) d of net gauge ≥ 4.0 mm → any gap will be found at B (no tolerance)
3. The easy method for checking the net gauge is by using the digital thickness device for racket coverings. This method is suitable to check the heavy net gauge, but not the light net gauge because of bending under the weight of the digital device.



Figure 9: Easy method for checking the net gauge by using the digital thickness device

How to check or adjust the tension and the height of the net by using net gauge

Those are concretely described in Technical Leaflet T2 - The Net Assembly.
It is strongly recommended to first adjust for tension and then for height.

How to check the thickness of rubbers with net gauge

It is described in detail in Technical Leaflet T9 - Racket Control.

End of T5