2.5 TRA Trampoline Gymnastics
1. Frame

1.1. Interior measurements of the frame, with bed under tension, but without frame pads:

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>505 cm +/- 6 cm</td>
</tr>
<tr>
<td>Width</td>
<td>291 cm +/- 5 cm</td>
</tr>
</tbody>
</table>

1.2. For safety reasons the profile of the frame must have rounded edges. The radius must be min 15mm. The profile of the frame may also be oval or round, but in these cases, it must be guaranteed, that coaches are able to stand on the frame safely in order to give the necessary support to the athletes. Special attention must be given to the padding of the frame.

2. Trampoline Bed

2.1. The height of the bed, measured from the floor, shall meet all of the following three specifications:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Minimum/Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>h₁, h₂, h₃ or h₄</td>
<td>115.5 cm +/- 0.5 cm</td>
</tr>
<tr>
<td>h₁, h₂, h₃ and h₄</td>
<td>115.0 cm</td>
</tr>
</tbody>
</table>

2.1.1. At least one of the heights h₁, h₂, h₃ or h₄ (see figure) ≥ 115.0 cm

2.2. Dimensions¹ of the bed under tension ready for use, excluding attachment straps:

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>428 cm +/- 6 cm</td>
</tr>
<tr>
<td>Width</td>
<td>214 cm +/- 5 cm</td>
</tr>
</tbody>
</table>

2.2.1. Web Construction:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Minimum/Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width of web under tension</td>
<td>0.55 cm +/- 0.15 cm</td>
</tr>
<tr>
<td>Distance between any two webs</td>
<td>1.6 cm (max.)</td>
</tr>
</tbody>
</table>

2.2.2. String Construction:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Minimum/Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width of strings under tension</td>
<td>0.3 cm +/- 0.1 cm</td>
</tr>
<tr>
<td>Distance between any two strings</td>
<td>up to 1 cm</td>
</tr>
</tbody>
</table>

2.3. The bed must be constructed from light coloured bands, webs, strings etc., which must be held together in such a way that they are not displaced during use.

2.2.1. (continued)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Minimum/Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Construction:</td>
<td></td>
</tr>
<tr>
<td>Width of web under tension</td>
<td>0.55 cm +/- 0.15 cm</td>
</tr>
<tr>
<td>Distance between any two webs</td>
<td>1.6 cm (max.)</td>
</tr>
</tbody>
</table>

2.2.2. (continued)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Minimum/Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>String Construction:</td>
<td></td>
</tr>
<tr>
<td>Width of strings under tension</td>
<td>0.3 cm +/- 0.1 cm</td>
</tr>
<tr>
<td>Distance between any two strings</td>
<td>up to 1 cm</td>
</tr>
</tbody>
</table>

2.4. The bed must be strong enough to withstand wear, and not tear when in use.

2.5. The jumping zone¹ must be marked out clearly in red on the middle of the bed. The lines belong to the jumping zone.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Minimum/Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length (j₁, j₂, j₃, see figure)</td>
<td>215 cm +/- 4 cm</td>
</tr>
<tr>
<td>Width (jw₁, jw₂, jw₃, see figure)</td>
<td>108 cm +/- 4 cm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specification</th>
<th>Minimum/Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>215 cm +/- 4 cm</td>
</tr>
<tr>
<td>Width</td>
<td>108 cm +/- 4 cm</td>
</tr>
</tbody>
</table>

The centre of the bed must be indicated by a red cross.

Dimensions | 70 cm +/- 3 cm

¹ Trampoline beds are subject to considerable changes in dimensions due to the high tensions. All length specifications shall be fulfilled at the following instant of times:

- Competition: At the time of the officially announced apparatus control before the competitions and thereafter.
- During other official apparatus controls (i.e. test at a FIG test institute): After a period of 24h with the trampoline unfolded, ready for use and preconditioned with 20°C ± 3°C and a humidity of < 60%.

FIG Apparatus Norms
January 2014
3. Suspension
The bed must be suspended with springs in such a way as to present no danger to users. The tension on the bed should be such that the bed stabilises within a second after contact.

4. Area free of obstruction beneath the bed
The trampoline must be constructed so that the competitor will not touch any part of the frame beneath the bed.

5. Safety Padding
5.1. The frame and springs must be entirely covered by a shock absorbing padding, the thickness of which must be between 3.0 cm and 5.0 cm at the edge near the bed. At the edge over the frame the thickness must not be necessarily the same: It can increase up to 10 cm, however the maximum slope between the two edges shall not be higher than 10 degrees from horizontal plane. The padding must not touch any part of the bed. The padding may extend over the bed by up to 6 cm, but the available unobstructed jumping area may not be smaller than the minimum bed size (422 cm x 209 cm).

5.2. The padding should be firmly fixed to the frame without hindering the normal action of the bed and springs. It should not cause noise through flapping.

5.3. The bottom of the padding, at the side of the bed, should not protrude above the level of the bed by more than 6 cm. The padding must be stable enough to allow for a person to stand on it without protruding into the spaces between the springs.

5.4. The foam of the safety padding shall have a density of 30 kg / m$^3$ (±/2,5 kg /m$^3$). The ultimate tensile strength of the foam shall be ≥ 260 kPa, the compression stress value 40% shall be 70 (±/- 1) kPa

6. Safety Platform
6.1. Platforms must be placed at both ends of the trampoline. The platform must be made of a framework which is firmly attached to the trampoline. The platforms must be constructed so that it is shock absorbent and the surface must be covered with a shock absorbing mat, firmly fixed to the platforms.

The mats must have the following dimensions:
- Width: 300 cm ±/2,5 cm
- Length (including wedge, 40 cm): 240 cm ±/2,5 cm
- Thickness at the bedside: 7,5 cm ±/-0,5 cm
- Thickness at the end: 20 cm ±/-2,0 cm

The platforms dimensions must be such, that the mats are sufficiently supported to ensure, that on landing, it supports the weight of the competitor without collapsing or folding. The foam of the mats shall have a density of 25 kg / m$^3$ (±2,5 kg /m$^3$). The ultimate tensile strength of the foam shall be ≥ 130 kPa, the compression stress value 40% shall be 4,0 (±/- 0.4) kPa

6.2. The mat covering the platform shall end between inner and outer edge of the frame pad. The distance to the inner edge of the frame pad shall be 5 to 8 cm. (see figure)

7. Safety mats on the ground: Mats shall rest on the ground around and between the trampolines for safety reasons. All mats shall be of the same height and type. One of the following two types shall be used:

a) Mats which satisfy the specifications of MAG11/WAG11/TRA11. (measures: Height: 20 cm, Width: 200cm, Tolerance: +=- 1 cm).

b) Mats with a core which shall have a density of 25 kg / m$^3$ (±/-2,5 kg /m$^3$). The ultimate tensile strength of the foam shall be ≥ 130 kPa, the compression stress value 40% shall be 4,0 (±/- 0.4) kPa. Ultimate tensile strength of the cover material shall be 560-600 kPa. (measures: Height: 20 cm min, Width: 200cm, Tolerance: +=- 1 cm).
Trampoline

Fig Apparatus Norms
January 2014

II
TRA 1
01.01.2014
82

vue de côte
side view
Seitenansicht

vue de face
front view
Frontansicht

vue de dessus
top view
Aufansicht

Délimitation de la toile avec des bandes de fixation
boundary for the bed includ. straps
Begrenzung Tuch inclusive Befestigungsbänder

Detail
Tapis sur la plateforme de sécurité
mat covering the platform
Matta auf Sicherheitsplattform

notes obligatoires:
dimensions: mandatory;
construction selon le gré,
design: at your discretion;
dessin au exemple
drawing: typical example
Maße bindend;
Konstruktion freigestellt,
Zeichnung als Beispiel

FIG Apparatus Norms
January 2014
Specifications:
Hauteur, longueur et largeur de la toile
Height, length and width measurements of the bed
Höhe, Länge und Breitenmessung

zones des mesures de la hauteur
areas for height measurement
Messbereiche für Höhenmessung

toile: Mesures de la longueur et de la largeur
bed: Length and width measurements
Tuch: Längen und Breitenmessungen

zone de saut: Mesures de la longueur et de la largeur
jumping zone: Length and width measurements
Sprungzone: Längen und Breitenmessungen

<table>
<thead>
<tr>
<th>construction selon le prêt</th>
<th>dimensions: mandatory, design: at your discretion, drawing: typical example</th>
<th>Maßstab bedeutend, Konstruktion frei gestellt; Zeichnung als Beispiel</th>
</tr>
</thead>
<tbody>
<tr>
<td>dessin en exemple</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Double Mini - Trampoline

1. Frame

1.1. For safety reasons no metal bars or other firm fixings are allowed across the ends of the Double Mini-Tramp other than at floor level.

1.2. For safety reasons the profile of the frame must have rounded edges. The radius must be minimum 15mm.

1.3. Safety Padding

1.3.1. The frame and springs must be entirely covered by shock absorbing padding, the maximum Thickness of which must not be greater than 55mm. The padding must not cover any part of the bed.

1.3.2. The padding should be firmly fixed to the frame without hindering the normal action of the bed and the springs. Nor should it cause noise through flapping.

1.3.3. The bottom of the padding at the side of the bed should not protrude above the level of the bed by more than 6 cm.

1.3.4. The bars beneath the bed must be padded.

1.3.5. The frame ends on the dismount end must be covered with at least 50mm pads firmly joined together with the other padding.

2. Bed

2.1. The bed must be constructed from light coloured bands, webs, strings etc., which must be held together in such a way that they are not displaced during use.

2.2. Dimensions\(^1\) of the bed under tension

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length (b_1; b_2; b_3)</td>
<td>285 cm +/- 5 cm</td>
</tr>
<tr>
<td>Width (b_{w1}; b_{w2}; b_{w3})</td>
<td>92 cm +/- 4 cm</td>
</tr>
<tr>
<td></td>
<td>with: (\max(b_1, b_2, b_3) - \min(b_1, b_2, b_3) &lt; 10) cm</td>
</tr>
<tr>
<td></td>
<td>with: (\max(b_{w1}, b_{w2}, b_{w3}) - \min(b_{w1}, b_{w2}, b_{w3}) &lt; 2) cm</td>
</tr>
</tbody>
</table>

2.3. Height of bed, measured from the floor with bed under tension:

- Mounting End: 45 cm +/- 1.5 cm
- Dismounting End: 70 cm +/- 1.5 cm

2.4. Width of web under tension: 0.4 cm min. 1.3 cm max.

2.5. The strands of webbing (or string) must be sewn together, and the distance between any two strands must not be greater than 1.8 cm (max: 1 cm with string-construction).

2.6. The bed must be strong enough to withstand wear, and not tear when in use.

\(^1\) Double Mini Trampoline beds are subject to considerable changes in dimensions due to the high tensions. All length specifications shall be fulfilled at the following instant of times:

- Competition: At the time of the officially announced apparatus control before the competitions and thereafter.
- During other official apparatus controls (i.e. norm-control by TC members): After a period of 24h with the double mini trampoline unfolded, ready for use and preconditioned with 20° ± 3° C and a humidity of < 60%.
2.7. The Penalty Zones must be marked in red on the bed.
The dimensions of these zones are:
- End markers: 13 cm +/- 2 cm
- Centre zone: 39 cm +/- 1 cm
- Distance of the Centre Zone: 90 cm +/- 2 cm

(Measured from the mounting end)

3. Landing Area
3.1. The landing area shall be covered with a landing mat (TRA11) which is shock absorbent and which allows a stable landing on the feet.
Dimensions of the landing area must be:
- Length (landing mat, TRA11): 600 cm +/- 1 cm
- Width (landing mat, TRA11): 300 cm +/- 1 cm
- Thickness (landing mat, TRA 11): 30 cm +/- 1 cm

3.2. Additional safety mat behind the landing area
An additional safety mat with the minimum dimensions of 300 * 200 * 20 cm must be placed directly behind the landing area.

3.3. Landing Zones
Two landing zones must be marked out in the landing area, with either the whole zone in a contrasting colour or, with lines 50mm wide in a contrasting colour. If lines are used, they have to belong to their zones.

3.3.1. Landing Zone C:
The size of landing zone C is identical to the size of the Landing Area (see 3.1 above)

3.3.2. Landing Zone B:
The outer edge of the landing zone (or lines) marks the boundary of the landing zone, the dimensions of which must be:
- Length: 400 cm +/- 1 cm
- Width: 200 cm +/- 1 cm

3.3.3. Landing Zone A:
The outer edge of the landing zone (or lines) marks the boundary of the landing zone, the dimensions of which must be:
- Length: 250 cm +/- 1 cm
- Width: 100 cm +/- 1 cm

For certain events the FIG may stipulate the colours of the different zones.

4. Run-up
Floor mats shall be used on the run-up:
- Length: 2000 cm + 250 cm
- Minimum Width: 100 cm
- Thickness: 2.5 cm +/- 0.5 cm

5. Safety mats on the ground: On the two sides of the DMT a mat shall rest on the ground for safety reasons (measures: Height: 20 cm, Width: 200cm, Tolerance: +/- 1 cm). They have to satisfy the specifications of MAG11/WAG11/TRA11.

6. No testing procedures for Double Mini-Trampolines at a test institute are available at the moment. The test must be performed by a federation who qualified with a team for the Men’s Team Final in Double Mini-Trampoline at the last held World Championships. Further Procedures for Certification see Part III, 4.1. and 4.2.
Double Mini - Trampoline

vue de face
front view
Frontansicht

vue de côté
side view
Seitenansicht

vue de dessus sur les deux surfaces, rectangulaires
top view, perpendicular to both areas
Aufansicht, rechtwinklig zu beiden Flächen

r: min 15mm

Variantes - détail profil du cadre
variants - detail profile of the frame
Varianten - Detail Rahmenprofil

<table>
<thead>
<tr>
<th>(r: \text{min } 15\text{mm})</th>
<th>(r: \text{min } 15\text{mm})</th>
<th>Maß bindend;</th>
</tr>
</thead>
<tbody>
<tr>
<td>(r: \text{min } 15\text{mm})</td>
<td>(r: \text{min } 15\text{mm})</td>
<td>Konstruktion freigestellt;</td>
</tr>
<tr>
<td>(r: \text{min } 15\text{mm})</td>
<td>(r: \text{min } 15\text{mm})</td>
<td>Zeichnung als Beispiel</td>
</tr>
</tbody>
</table>
toile: Mesures de la longueur et de la largeur
bed: Lenght and width measurements
Tuch: Längen und Breitenmessungen

délimitation de la toile
largeur: Avec des bandes de fixation
longueur: bordure à bordure des marquages des extrémités

boundary for the bed
width: Includ. straps
length: Edge to edge of the included end markers

Begrenzung Tuch
Breite: Inklusive Befestigungsbänder
Länge: Von Rand zu Rand der zugehörigen Endmarkierungen

| coses obligatoires; construction selon le gré; dessin en exemple | dimensions: mandatory; design: at your discretion; drawing: typical example | Maße bindend; Konstruktion freigestellt; Zeichnung als Beispiel |
1. Tumbling Track
   1.1. The tumbling track must be constructed with a sprung surface, which must be padded. If constructed of several units these must be firmly fixed together as so not to separate in use and showing no space between them.
   Dimension:
   - Length: 2500 cm ± 100 cm
   - Height: 30 cm max (from 1.1.2012: ± 1 cm)
   - Width of construction: 200 cm ± 5 cm
   1.2. Markings
   - Two lines, 50mm wide in a contrasting colour must mark the outer edge (boundary) of the track.
   - Distance (incl. lines): 150 cm +/- 1 cm
   - A centre line, 5 cm wide, in a contrasting colour, must mark the centre line of the tumbling track.

2. Landing Area
   2.1. The landing area shall be covered with a landing mat (TRA11) which is shock absorbent and which allows a stable landing on the feet. The height of the landing mat shall be equal to the height of the tumbling track.
   Dimensions of the landing area must be:
   - Length (landing mat TRA11): 600 cm +/- 1 cm
   - Width (landing mat TRA11): 300 cm +/- 1 cm
   - Thickness (landing mat TRA11): 30 cm +/- 1 cm

2.2. Additional safety mat behind the landing area
   - An additional safety mat with the minimum dimensions of 300 * 200 * 20 cm must be placed directly behind the landing area.

2.3. Landing Zone
   - A landing Zone must be marked out in the landing area, with either the whole zone in a contrasting colour or, with lines 50mm wide in a contrasting colour. The outer edge of the landing zone (or lines) marks the boundary of the landing zone, the dimensions of which must be:
   - Length: 400 cm +/- 1 cm
   - Width: 200 cm +/- 1 cm

   - A non-compulsory supplementary mat in the same dimension as the landing zone can be used (TRA13). In this case the supplementary mat must be attachable to the landing mat (i.e. using Velcro). The colour of the supplementary mat must be in contrast to the landing mat and the tumbling track or with lines according to the description above.

3. There must be a run up area (same level as tumbling track) prior to the tumbling track.
   Dimensions:
   - Length: 1000 cm +/- 100 cm
   - Minimal width: 100 cm

4. There must be a hard and a soft Vaulting Board available which meets the specifications of TRA 14.
Tumbling track

- **Tapis supplémentaire de sécurité** (additional safety mat)
- **Zone de sécurité** (safety zone)
- **Ramp**
- **Run-up area** (Anlauffläche)
- **Surface de réception** (landing area (Landefläche))

Additional safety mat

Safety zone

Run-up area

Landing area
Use

- Double Mini-Trampoline; Tumbling; Trampoline

**Construction / Description of material, measurements**

<table>
<thead>
<tr>
<th>Form</th>
<th>The surface must be horizontal, even and without gaps. To arrange the whole area several mats can be composed.</th>
</tr>
</thead>
</table>
| Measurements | Height safety mat Trampoline; DMT (TRA1, TRA2): 20 cm +/- 1 cm  
Height landing mat DMT; Tumbling (TRA2, TRA3): 30 cm +/- 1 cm |
| Functional Properties | Absorbency: The mats must absorb motion energy, in order to reduce the reaction transmitted to the body of the landing gymnast, to a tolerable proportion.  
They must respond to increased penetration with an evenly increasing resistance.  
Stability and Freedom of Movement: Absorbency of the mats must be balanced in order to guarantee standing, walking stability and freedom of movement; there must be an equal balance between elasticity and absorbency properties.  
Indentations caused by the incidence of compressive forces must not encase the body parts, thereby hindering freedom of movements mainly of rolling a part of the body.  
If a cover is used, such cover may not cause any hindering folds. The mats’ upper surface material must offer a balance between anti-slip and slippage. It must be neither slippery nor possess inhibitory resistance.  
By no means should mats be dislocated during performances. An anti-ski cover on the mats’ underside may provide this condition.  
The border zones of the mats which are pushed together should practically have the same functional properties as the remaining surface. Impacts on the border zones should not cause different indentations than on the remaining surface. For this purpose, and to bridge joints, continuous runners are permitted. |
| Colour     | Preference should be given to uniform colours.  
The upper surface must not show optically disturbing patterns or insignia.  
The FIG may designate the colour for certain events. |

Norms / Functional properties

Regarding tests carried out by FIG Tests Institutes: please see chapter IV
Use

- Trampoline; Double Mini-Trampoline;

Construction / Description of material, measurements

<table>
<thead>
<tr>
<th>Form</th>
<th>Spotter mats must be covered with a material which will slide easily. The mats must be provided with at least two handles or one long handle on the two long sides of the mat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurements</td>
<td>Length</td>
</tr>
<tr>
<td></td>
<td>Width</td>
</tr>
<tr>
<td></td>
<td>Thickness</td>
</tr>
<tr>
<td>Functional Properties</td>
<td>The foam of the spotter mats shall have a density of 20 kg / m(^3) (+/- 2 kg /m(^3)). The ultimate tensile strength of the foam shall be ≥ 90 kPa, the compression stress value 40% shall be 2,5 (+/- 0.5) kPa</td>
</tr>
<tr>
<td>Colour</td>
<td>Preference should be given to uniform colours. The upper surface must not show optically disturbing patterns or insignia. The FIG may designate the colour for certain events.</td>
</tr>
</tbody>
</table>
### Supplementary mat

#### Tumbling

**Use**

- **Tumbling:**

**Construction / Description of material, measurements**

<table>
<thead>
<tr>
<th><strong>Use</strong></th>
<th>A supplementary mat must be available for the landing area in Tumbling. The usage is not compulsory.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Form</strong></td>
<td>Their upper surface must be horizontal, even and without gaps. It shall have the size of the landing zone. The supplementary mat can be laid on the landing mats (TRA11), if used it must be attachable to the landing mat (i.e. using Velcro).</td>
</tr>
</tbody>
</table>
| **Measurements** | **Height of the supplementary mat:** 10 cm * 1 cm  
**Surface:** 400 x 200 cm * 1 cm  
* Tolerance +/- |
| **Functional Properties** | The foam of the supplementary mats shall have a density of 25 kg / m$^3$ (*/- 2 kg /m$^3$). The ultimate tensile strength of the foam shall be ≥ 115 kPa, the compression stress value 40% shall be 4,0 (*/- 0.5) kPa  
Their upper surface must be horizontal, even and without gaps. The supplementary mats have to be laid on the landing mats. The supplementary mat shall be attachable (i.e. using Velcro). |
| **Colour** | The colour of the supplementary mat must be in contrast to the landing mat and the tumbling track or with lines according to the description of the landing zone (see TRA3).  
The upper surface must not show optically disturbing patterns or insignia.  
The FIG may designate the colour for certain events. |
# Vaulting Board

Use  •  Tumbling “hard” and “soft”

## Construction / Description of material, measurements

<table>
<thead>
<tr>
<th>Form</th>
<th>The profile of the vaulting board must adhere exactly to the respective blueprint. Its upper surface rises in an arched form, approaching the horizontal between 75 cm and 95 cm, measured from the frontal angle. The height reached at this point, may not be exceeded. After this point, the upper surface may continue horizontally or slope downward. The rise of the arch is 3.5 cm +/- 0.5 cm. For competitions a “soft” and a “hard” vaulting board shall be available. The “hard” board shall be marked with a dot on the surface.</th>
</tr>
</thead>
</table>
| Measurements | - Length 120 cm +/- 1 cm  
- Width 60 cm +/- 1 cm  
- Height 20 cm +/- 1 cm  
- Height (run-up side) max 3 cm  
- Cushion Cover 2 cm +/- 0.5 cm  
- Total height with cushion cover 22 cm +/- 1.5 cm  
- Free space between floor and the lower edge of the vaulting board at the run-up side max. 1 cm  
*Tolerance +/-  
The stipulated length and height refers to the vertical projection of the upper plate, i.e. the take-off plate. The base may be larger, but cannot extend more than 2 cm beyond the projection of the board.  
Labelling of the “hard” vaulting board on the surface by a dot with clear contrast on the longitudinal midline:  
Distance to the side of run up 5 cm  
Diameter 8 cm  |
| Functional Properties | The functional properties of the vaulting board (hardness, damping, elasticity) shall not be adjustable (i.e. springs must be fixed so that they cannot be easily removed by hand).  
The elasticity of the vaulting board must be most effective in the area between 75 cm and 95 cm, measured horizontally from the frontal angle.  
The vaulting-board must dampen the counter pressure, i.e. reduce motion energy.  
Elasticity and absorbency must be evenly distributed, so that the effect of the vaulting board differs only slightly, regardless whether the force of the impact is at the middle axis, or away from it.  
The upper surface of the vaulting board must offer slip resistance. |
The board must not produce disturbing sounds during its use.

The board must not dislodge during use.

The vaulting board and its base may not have any sharp corners, edges and no protruding parts. Mainly the upper and under edge of the upper part of the vaulting board towards the apparatus side (Vaulting Table, Balance Beam of Uneven Parallel Bars) shall be cushioned and rounded.

The choice of colour is left to the discretion of the manufacturer.

With exception of the dot for “hard” vaulting boards optically disturbing patterns, stripes or insignia on the upper surface are not permitted.

The FIG may designate the colour for certain events.
Vaulting Board

Plan
profile
Schnitt

vue de dessus
top view
Aufsicht

variant d'abaissment
lowering variant
Absenkungsvariante

Marcage pour tremplin dur
mark for the hard board
Markierung für hartes Brett
Use

• Helping device for judging individual and synchronized competitions

Construction / Description of material

General Requirements

The device must be able to measure deductions due to asynchronous landing in synchronized competitions as well as a sum of the flight times for the skills in individual competitions.

General Functions

1. Mode for synchronized competitions:
The device is attached to the two trampolines which are used for the competition. It has to be administrated by a specialized judge who is responsible for the evaluation of the score of synchronization (S). After a “Start” during the flight phase of the first element the device shall register all time intervals between the landings of the gymnasts. After the end of the routine the device has to calculate, to indicate and to memorize the deductions for each skill and the total score for synchronization according to a conversion ratio between time intervals and deductions (TRA Code of Points).

2. Mode for individual competitions:
The device is attached to the trampoline which is used for the competition. It has to be administrated by a specialized judge. After a “Start” during the flight phase of the first element the device shall register all time intervals between take-offs and the landings of the gymnast (flight times) including the flight time of the first element. At the end of the routine the device has to calculate, to indicate and to memorize the flight times of the elements as well as their sum (up to 10 skills).

Definitions

Measurement Lines: At least three parallel lines along the longitudinal side of the trampoline’s bed. The lines are arranged ≤ 100 mm below the under surface of the unloaded bed built-in a trampoline which is ready for use. One line shall be exactly below the middle of the jumping zone and at least two others are running in a distance of 540 (±5) mm from the middle line of the bed directly below the lateral boundaries of the jumping zone (see drawing).

Starting Point at Foot Contact: The point in time of the first contact of the gymnast with at least one of the Measurement Lines by impacting on the trampoline’s bed. At that time a measurable signal for the TMD shall be provoked.

Ending Point at Foot Contact: The point in time of the release of the gymnast from all Measurement Lines by taking off from the trampoline’s bed. At that time a measurable signal for the TMD shall be provoked.

Time Difference in Landing: Time interval at the landing after the same synchronous jump between the Starting Point at Foot Contact of the first athlete and the Starting Point at Foot Contact of the partner, expressed in seconds rounded down to the next lower multiple of 0.005 s (e.g.: All values less than 0.005 s are rounded to 0.000 s, all values equal or higher than 0.005 s and less than 0.01 s are rounded to 0.005 s).

Time of Flight: Time interval during the flight phase of a jump between an Ending Point at Foot Contact and a succeeding Starting Point at Foot Contact, expressed in seconds rounded down to the next lower multiple of 0.005 s. (e.g.: All values less than 0.005 s are rounded to 0.000 s, all values equal or higher than 0.005 s and less than 0.01 s are rounded to 0.005 s).

Total Time of Flight: Sum of all measured Time of Flights during an exercise.
Time measurement device for trampoline competitions
- TMD

of an individual competition beginning with the first skill, expressed in seconds. This value in seconds is equivalent to the score for the total time of flight in points.

Start: The point in time fixed by a switch-key to be pressed by a specialized judge during the flight phase of the first element; from this time on the TMD records signals at landings of the athlete on the trampolines bed. For individual competitions the device has to remember the preceding Ending Point at Foot Contact to register the Time of Flight of the first element.

Stop: The point in time fixed by a switch-key to be pressed by a specialized judge, from this time on the TMD records no more signals at landings of the athlete on the trampoline’s bed.

Deduction for unsynchronized Landing: Deduction in points for the synchronization of each element according to a conversion from the Time Difference in Landing according to the TRA Code of Points.

Example 1: Calculation for the Deduction for an unsynchronized Landing with a factor of 2.5, rounded to 1/10 and a special treatment for less than 0.01 s (*) and more than 0.20 s (**) (TRA Code if points 2009):

<table>
<thead>
<tr>
<th>Time difference in landing (s)</th>
<th>Deduction (pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 ≤ x &lt; 0.01</td>
<td>0.0 pts (*)</td>
</tr>
<tr>
<td>0.01 ≤ x &lt; 0.06</td>
<td>0.1 pts</td>
</tr>
<tr>
<td>0.06 ≤ x &lt; 0.10</td>
<td>0.2 pts</td>
</tr>
<tr>
<td>0.10 ≤ x &lt; 0.14</td>
<td>0.3 pts</td>
</tr>
<tr>
<td>0.14 ≤ x &lt; 0.18</td>
<td>0.4 pts</td>
</tr>
<tr>
<td>0.18 ≤ x ≤ 0.20</td>
<td>0.5 pts</td>
</tr>
</tbody>
</table>

if x > 0.2 then x:= 0.2 and deduction:= 0.5 pts (**)

(*) special treatment for less than 0.01 s.
(**) special treatment for more than 0.20 s.

Sum of Deduction: Accumulation of the Time Differences in Landing after each landing multiplied by 2.5 to give a total deduction rounded to 0.1 pts for all skills. As long as the unrounded sum is below 0.05 the corresponding sum of deduction shall be 0.0 pts. (***) (see example 2)

Synchronization Score: The Synchronization Score should be shown as maximum 10.0 pts minus the Sum of deductions in case of 10 skills (see example 2). Otherwise the maximum score equals the number of the counted skills (for example 5.0 pts for 5 skills).

Example 2: Calculation for the Sum of deduction and the Synchronization Score for a full exercise with 10 skills.

<table>
<thead>
<tr>
<th>Time differences in landing (s)</th>
<th>Acc.[rounded down] (s)</th>
<th>Sum of Deduction (pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 ≤ x ≤ 0.05</td>
<td>0.005</td>
<td>0.0 pts (***)</td>
</tr>
<tr>
<td>1st skill x:= 0.015</td>
<td>0.015</td>
<td>0.0375</td>
</tr>
<tr>
<td>2nd skill x:= 0.035</td>
<td>0.050</td>
<td>0.125</td>
</tr>
<tr>
<td>3rd skill x:= 0.120</td>
<td>0.170</td>
<td>0.425</td>
</tr>
<tr>
<td>4th skill x:= 0.295</td>
<td>0.370 (***)</td>
<td>0.925</td>
</tr>
<tr>
<td>5th skill x:= 0.430</td>
<td>0.570 (***)</td>
<td>1.425</td>
</tr>
<tr>
<td>6th skill x:= 0.030</td>
<td>0.600</td>
<td>1.500</td>
</tr>
<tr>
<td>7th skill x:= 0.005</td>
<td>0.600 (*)</td>
<td>1.500</td>
</tr>
<tr>
<td>8th skill x:= 0.115</td>
<td>0.715</td>
<td>1.7875</td>
</tr>
<tr>
<td>9th skill x:= 0.005</td>
<td>0.715 (*)</td>
<td>1.7875</td>
</tr>
<tr>
<td>10th skill x:= 0.010</td>
<td>0.725</td>
<td>1.8125</td>
</tr>
</tbody>
</table>

Sum of deduction := 1.8 pts
Synchronization Score := 8.2 pts

(*) special treatment for less than 0.01 s.
(**) special treatment for more than 0.20 s.
(***) Deduction := 0.0 pts as long as the unrounded sum is below 0.05

The device shall not interfere with the performance of the athletes nor shall it
**Technical Features**

- SELECT MODE – individual or synchronized competition
- RESET – Preparation for a new measurement
- START – start the measurement of an exercise, indicated by a sound
- STOP – stop the measurement of an exercise
- VIEW – MODE – with the following possibilities:
  
  **Synchronized competition mode**: Selection for each skill (from 1 to 10) with the calculated Deductions for unsynchronized Landing as well as the Synchronization Score for the whole exercise.
  
  **Individual competition mode**: Selection for each skill (from 1 to 10) with the registered Times of Flight as well as the Total Time of Flight for the whole exercise.
  
- Possibilities for a manual change of the Preliminary Synchronization Score with an increment of 0.2 points.
- Components to ensure proper function of the sensors.
- Components to indicate proper function of the power supply.
- Connection devices and software to transfer all data to a personal computer using a standard method of data transmission (USB, Firewire etc.).
- Software to memorize and print all data on a personal computer with the following details:
  - Time Differences in Landing and corresponding Deductions for unsynchronized Landing for all skills (from 1 to 10) as well as the Synchronization Score for the whole exercise for synchronized competitions.
  - Times of Flight for all skills (from 1 to 10) as well as the Total Time of Flight for the whole exercise for individual competitions.
### Approval

The approval of a TMD shall include the following steps:

- Confirmation by a member federation of the FIG (operation at a competition without technical problems; see: FIG Apparatus Norms Part III, clause 4.1).
- Presentation at a testing institute (forwarding a full technical documentation written in English and the complete equipment, if necessary with a special adapter according to: FIG Apparatus Norms Part IV TRA15 - TMD)
- Documented report by a TC member ordered by the FIG-TC-TRA-President about the functional status during a FIG competition

With successful fulfilment of all procedures the certification shall be given by the General Secretary.