

# BUYER BEWARE

## Quick Facts

Note: this should be read in conjunction with the articles: 'THE TECHNICAL STANDARDS' and 'TESTING – THEORY & MEASUREMENT'.

This is a **checklist** of phrases and impressions culled from recent advertisements or brochures for combat/judo mats. **All the references below are or could be suspect.**

With each of the examples below **either** the seller is in ignorance of technical Standards currently applicable **or** the seller (in spite of the technical Standards) is seeking market share by offering alternatives which sound acceptable but could in fact leave the user in an embarrassing situation if there is an accident with subsequent legal consequences. This can take many forms e.g.:

- i. Stating a specification which is not applicable, is wrong or implying merit which in reality is unjustified e.g. one supplier has referred to 'international density requirements'! There is absolutely no such requirement and the statement is total nonsense.
- ii. Stating or implying that the mats are 'approved' by some organisation which in fact has no technical capacity to so approve.
- iii. Stating that mats or the Company are approved by an organisation when this is simply not true.

Searching the web, advertisements and manufacturers brochures, the following examples were found. The list is not exhaustive.

1. **Club mats.** One could think that if mats are being purchased for a club, then these would be suitable. **NO!** This is the usual coded language for a mat which is **too soft**. A softer mat is cheaper to produce but from the users point of view has many problems:
  - a) The mats are **less durable** since they experience excessive flexing both in use and in handling.
  - b) A soft mat allows '**bottoming**' resulting in high peak g – a common cause of impact injury.
  - c) A soft mat causes **excessive gripping** of the foot which can result in severe rotational leg injuries, especially to the knee. In addition, the technical requirement for rapid foot movement is compromised.
  - d) The mats will probably not meet the current technical Standards with resultant **risk of legal liability**.
2. **Childrens'/Junior Mats.** This is normally coded language for a **thin** and/or **cheap** mat. All the problems that are indicated under 'club mats' apply equally here.

Apart from problems as for 'club mats', it is natural perhaps to feel that children need a softer mat. **NOT SO!** In fact, there is little evidence that they suffer from **impact** injuries since children have more flexible tissues than adults and they fall from lower heights thus experiencing a lower peak g (refer to the mat impacter tests in article **Testing – Theory & Measurement**). The Standards make no reference whatsoever to a modified specification for children.

The rationale for having a 'junior' mat is negated by the near necessity for adult instruction **on** the mat and misuse (in ignorance or otherwise) by adult groups. Such a distinction is impractical and has legal and insurance aspects which can be insurmountable. (What is the defining distinction between a child and an adult?)

One supplier even goes so far as to specify (presumably an ad hoc opinion?) a limiting athlete weight of 65kg for a particular specification of mat. In spite of spending more than 25 years on both the British and European Standards Committees, I have never once come across any research which would justify such a claim. I wait to be advised otherwise!

3. **Lightweight/portable mats** – an alternative description commonly used for either childrens'/junior mats (see above) or for jigsaw type linking mats. There are serious concerns about the top friction which can lead to mat burns and excessive foot gripping.

No matter what the thickness or specification otherwise, there is no solution to the fact that hygiene is a serious problem with linking mats. The surface and cut foam of the mat cannot be properly cleaned, let alone sterilised in the case of a blood spill or other source of infection (e.g. HIV, hepatitis). Vinyl covered mats with sealed corners and no exposed foam can be wet sterilised rapidly and with certainty.

4. **Statement of 'Density'** e.g. 14lb/cu ft or 230kg/cu m. This is a common occurrence and unfortunately the tendency to state the 'density' is **increasing** as some companies are belatedly realising that there **are** technical standards but are not sure what exactly they are!! Perhaps such companies feel that quoting a 'density' gives the impression that they are on the ball. It is a fact that **the density of a mat is entirely irrelevant to the Technical Standards**. What **is** relevant is **hardness** and is measured by the mat's **deflection** (refer to the mat impact tests in article **Testing – Theory & Measurement**).

Density is defined by the relationship of mass (weight) and volume viz,

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

Density will have some relationship to hardness **for a given material**. Mats however can be made from different materials and therefore valid comparisons of hardness **cannot be made by reference to density**. It is quite possible for an 80 kg/cu metre in one material to be harder than a mat three times as dense at 240kg/cu metre.

This is not the only complication. The **hardness** of the mat will be **dramatically changed** depending on the base material of the covering vinyl. If the base material is knitted and therefore highly flexible it will offer little resistance to impact. However if the base material is woven and very strong, it will not allow the upper vinyl to stretch easily. This causes a 'trampolining' effect and a decrease in deflection thereby causing the mat to be much firmer than otherwise.

What the mat density tells you however, is roughly how heavy the mat will be to carry around!! Not what the supplier is trying to tell you, presumably?

**As a rough guide** to suitable hardness for judo, a person of average build standing with bare feet, weight equally distributed and feet about 30cm apart should not give rise to any noticeable depression in the mat surface. When the weight is moved entirely onto one foot a **slight** depression should be seen. For karate, even with the weight on just one foot, almost no change in the mat surface is acceptable. **The important characteristic is that a mat should be firm to stand on and progressively collapse with increasing severity of impact.**

*N.B. Yes, even Shogun ([www.shoguninternational.com](http://www.shoguninternational.com)) used to refer to density but that was before technical standards were established. It now only appears on any outdated literature which has managed to escape attention!!*

5. **Rubber/Rubberised Antislip**. There are generally 2 types of antislip in use for combat mats (or they may have none at all).

The only effective antislip has a **cellular structure** and is at least 2–3mm thick including the base material. It is quite common to find however that many so called 'antislip backings' are in fact just a scrolled layer of rubber paint. **After they have been laid a few times, what little effectiveness there was in the first place, almost totally disappears.** Commonly,

the high points become glazed (especially from polished floors) after which time, they slide easily. Slipping mats are a common source of injury.

6. **Fire Resistant** – totally meaningless without qualification as to which ignition source they are certified. (Ignition sources are defined between 0 and 7). There is only one relevant fire test to assess ignition source resistance - BS 1892 Part 3 published in 2003.

If CMHR (combustion modified high resilience) foam is used and attains ignition resistance to either source 3 or source 5 (commonly accepted for 'low' and 'high' hazard storage areas respectively), it is fairly certain that the mat will not meet the current technical performance standards. No combat/judo mat, to the best of my knowledge, has ever been produced which meets both the standards of performance and ignition resistance.

7. **International Judo Federation approved** – this has limited or no added value to the European Standard because from a technical standpoint, the IJF rely on the European Standard (BS EN 12503 Parts 3-7) and also (for some inexplicable reason) either of two French Standards which can only be met by weighty 50mm mats used almost exclusively for permanent installations.

There is considerable room for ambiguity in IJF approval. A company having different specifications of mats may have one of them 'approved' but could be advertising or supplying one of the other models. You have to consider, is it the Company or is it the mat which is approved?

The IJF is currently (Dec 2005) confirming that there are **no 'approved' companies in the UK.**

8. **Tatami** – this is for light relief and the pedantic amongst us! A tatami is defined by the Oxford English dictionary as 'a matting made of rice straw'. Judo/combat mats conforming to the established technical standards today do not begin to resemble tatami and therefore the use of this word should be deprecated. (Incidentally since this word is both singular and plural, there is no such word as 'tatamis'!!)

Do not confuse tatami with tatami **pattern** vinyl which is often used for mat covering.

9. **Crash mat** – this is unwise terminology in view of an event which had legal consequences resulting from the use of the word 'crash' and its implied meaning. The term encouraged by the British Standards is **fall mattress**.

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**SUPERMAT**, the only mat produced by **Shogun International Ltd** conforms to **both** the only two established technical Standards in the UK for combat performance – judo or otherwise. **Shogun** does not subscribe to **any** of the above incorrect or misleading practices.

## CAUTIONS

1. **Buying from abroad?** Yes, you can do this – it is easier these days but will the mat conform to the British Standard? How safe is your payment? Who from the Company would come to your help in the event that you require legal support?
2. **Samples.** Yes, it is a good idea to ask for a sample. **Shogun** will send an exactly true representation from the production line on request.

From a sample, you can **only** see the materials used. What you cannot check **from any supplier** is:

- i. whether the materials will age rapidly or gracefully and especially whether the foam will harden or lose resilience due to the addition of chemical hardeners.
- ii. whether the tolerance on dimensions is fine enough to allow substantial areas to be formed without gaps appearing (**tip**: lay mats **from the centre outwards** for the best fit at any tolerance level).
- iii. whether the mat will lie flat or curl.
- iv. whether the core material is of even specification throughout and indeed whether all the mats have a reasonably even match.
- v. whether the corner is properly sealed (in the case of a sample which does not include a corner).
- vi. the exact hardness since almost certainly you will be squeezing an edge unsupported by surrounding material. Samples therefore tend to feel softer than the same specification of mat in use.

## AND FINALLY

If you have any contrary opinion, questions or can contribute to this article you are welcome to [contact us](#). We look forward to receiving your comments.

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No adverse or dissenting comments have been received regarding this article (Jan 2010).