

We have had to invent an entirely new unit of measurement, to accurately quantify impacts in sport. we call this the franklin (f), a compound unit of power and energy, a quantification of 'human force'

## The Past.

For years scientists, under clinical conditions, have measured Boxer's punches. Not with a view to creating a new generation of training equipment, more to satisfy their own curiosity along with boxing fans generally and to determine who has the biggest punch. Well I am sorry to disappoint, but all these studies have been in vain. As force is the common unit of measurement, no two studies are comparable as the rigs used are not standardised. Force is entirely subjective which means the harder the surface the higher the force. The scientist with the hardest rig will produce the biggest number, for the same fighter! Here are two quotes:

*Ricky Hatton study of 5 punches by MACE <http://news.bbc.co.uk/1/hi/6228040.stm> 'following 5 punches Mr Hatton broke the equipment'. After weeks of deliberation and reference to previous studies **the team of scientists** concluded the punch measured was 880lb. The punch bag used was 66lb in weight, had they had used a 100lb bag they would have got a bigger number, fill the bag with sand and the numbers will go up again and so on. Maximum force is only achievable when an immovable object (like a brick wall) is struck, because maximum deceleration is achieved. Which study then is correct? This exercise cost around £12500+VAT. These numbers (880lbs) could not be achieved when punching another fighter anyway, because unlike a punch bag they are not anchored!*

So it's all rather academic.

A martial artist on the other hand could exceed these numbers during Breaking, of an appropriately hard surface like concrete!

*Amir Khan (magazine quote from 2011). I've never measured how powerful my punch is. I've broken punching machines. I've beaten guys ten times my size but I haven't measured my punch **because it's not worth smashing my hands up.***

This was the background to me forming Strike Research and creating StrikeMate as a standardised commercial product for impact measurement and power training in the gym, ring or at a tournament. Primarily for Boxers and Martial Artists it is as an accessible science based training aid, with four clear objectives:

- **To fine tune power techniques, illuminating and testing the differences between the various theories that surround power generation.**
- **To discover weaknesses in a professional fighters repertoire, through the establishment of performance norms and then training them out.**
- **To make valid comparisons not only between techniques but other individuals of similar stature and similar discipline anywhere in the world, with the same equipment.**
- **To establish healthy impact norms in order to provide advanced warning signs of unknown health problems (for example, shoulder and back strains, torn or damaged muscles, bruised wrists and hands) and further to establish full recovery following a known health problem (through regular monitoring).**

StrikeMate does however have similar applications in Rugby and American football for physiotherapists also wishing to establish healthy impact norms following injury.

## The future with new science.

StrikeMate reads data instantly into a PC and is purpose designed to be hand held. It is compressible and tactile making it suitable for training for all ages and levels of competency (under 18's require supervision). Alternatively we have wall mounting systems, for scientific studies and training alone.

**It is my conclusion that an impact in the Fighting Arts is too complex to be expressed as a single unit, like the Newton (unit of force) or Pressure (PSI or pounds per square inch).**

**There are only two component parts that determine the magnitude of this type of impact.**

**They are, *Speed Power*, which is related to the speed of the technique and the *Compressive Energy*, which is the moving weight component (kinetic energy) behind the technique, (which gives the impact its' penetrative characteristic).**

**All the parameters of a technique, namely, breathing, stance, hip and shoulder movement, and weight dropping simply contribute to these two parameters; only StrikeMate can quantify both:**

**By differentiating between these two we can now see how each contributes to the overall impact of any strike, irrespective of whether this is a fast light technique or a heavy relatively slow one. We call this combination 'franklins (f)' a quantification of human force.**

***Compressive Energy* (of the technique) is calibrated in calories X10 and *Speed Power* calibrated in foot pounds /weight per second.**

**A franklins(f) is derived from a combination of cross calibration and original wave form analysis involving over 1000 athletes. This includes data gathered from testing experienced TAGB Breakers and world class professional Boxers. By weighting the energy and power components based on this data we have a compound unit that universally all athletes agree, the harder you hit it the bigger the number.**

**By quantifying both components, weaknesses in training become immediately apparent and fine tuning, for more power, becomes possible for the first time.**

*Speed Power* (speed related) is normally associated with rotational techniques and *Compressive Energy* (weight shifting) with linear techniques. The *Compressive Energy* in a rotational technique is simply related to the weight of the limb.

Techniques with large amounts of *Compressive Energy* have far more of a penetrative characteristic (and tend to push the opponent backwards) than snappy faster ones. **These techniques then are perfect for body shots but at the expense of burning considerably more calories during a fight.**

Techniques with a large element of *Compressive Energy* go a long way to explain the mysteries of certain oriental arts that describe techniques as 'heavy' (hand, leg, arm)' or 'iron' (hand, leg, arm).

Techniques based on *speed* produce high levels of *impact without the penetrative component* and are perfect for head shots where the desired effect is to drop someone on the spot.

Techniques without the energy component will not penetrate the body core.

**Given the same hand *speed*, the heaviest fighter will always be the most effective at delivering damage.**

Longer limbs on the other hand will produce more speed and thus more *Speed Power* than a shorter limbed person.



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