How strong is a Schmool?

As one of the Schmoolz inventors, I've been hanging on them from day one. Granted, some of the early models were less than perfect and we did pop off a few times. A crash mat became an important part of our test equipment, sticking it just under the holds we were swinging from!!

I've been surprised at just how often people will pick up a Schmool and look at them questionably before asking me "just how strong are they?" It's probably testimony to the fact that we're all climbers and have to trust our safety with equipment manufactured by others. Today, wood isn't a material commonly used in climbing equipment – we're used to steel wire nuts, drop-forged cams and heat-treated krabs. Having said that, I'm still amazed that we all happily trust a 10mm Dynema sling – I still look at them suspiciously just before abseiling off a stance.

And that is essentially the essence of the climbing equipment quandary – what looks strong, and what is strong are often very different things. Nature will never fail to inspire man in his goal to go lighter and stronger.

So, today we put the tools to the test. "Destruction Testing" (the process of loading a product until it fails) is an integral part of any comprehensive manufacturing process. Some product designers will attempt to simulate this test using a mathematical technique called "finite element analysis". Nothing replaces real world testing so we thought that was a good place to start. Essentially, we had already undertaken a degree of destruction testing – using the Schmoolz in a live environment and hanging a 14 stone climber from them without any sign of failure or problems.

However, for the benefit of legislation, certification and simple piece of mind, the Schmoolz needed to be pushed to the point of failure.

Passing up the opportunity for some winter climbing in the Lakes, we arrived at IPB TESTING in Washington, Tyne and Wear. The Lab Manager welcomed us in and discussed the various tests that he could conduct and the relative merit of each one.

Most climbing equipment (classified as Personal Protective Equipment in Directive 89/686/EEC) is designed to withstand huge loads. A standard karabiner is usually rated at around 22kN which vastly exceeds our weight and the static loading we might apply to it. However, in a fall (which is where most equipment is used, relied upon and tested for) the climber is accelerating towards earth, as a result of gravity, and this acceleration acts as a component of the force exerted on the equipment. This has the effect of producing a much greater force for which the equipment must be able to withstand. This is commonly referred to as shock-loading and PPE climbing equipment is tested by shock-loading it with a falling mass.

Since Schmoolz are not classified as PPE, and are not designed or intended to be used as climbing protection, this type of shock-loading test isn't applicable. A more practical test would be to position the tool in a static fashion and slowly increase the load being applied until reaching a failure point – this is commonly referred to as a tensile test. We used a "gradual severe pull" which accurately simulated the effect of a climber hooking the Schmool and pulling their body weight up on a hold.

A number of Schmoolz (we were advised to test 10) were selected at random and each was connected to a Maves hydraulic loading machine.

The handle of the tool was clamped into a vice grip and an attachment was selected for the sling that best simulated a climbing wall handhold. The computer controlled machine then subjected the Schmool to a steady load of 50kN per second, increasing until the tool failed.

The samples failed in and around the same point, which was averaged out to produce a failure load rating of 4.63kN. A little bit of basic physics here:

1 Newton = 0.101971621298 Kilograms
4630 * 0.101971621298 = **472.1286 Kg**

472.13kgs – just short of a half a metric tonne! To say we were surprised would be an understatement – we knew the tools were strong but had no idea they were that strong. This effectively meant that by using two Schmoolz (which is the suggested technique) you could support nearly 940 kg's – more than enough to hang a mini-metro!

It is standard practice to half your failure load to give a maximum safe load and maximum safe weight (MSW), which based on our tests, rated the Schmoolz thus:

Maximum Safe Load: **2.31 kN**
Maximum Safe Weight: **235.55 kg**
(518.2 lbs / 37.09 st)

So the simple answer to the question "*Just how strong are the Schmoolz?*" is that Schmoolz really are plenty strong. If you're under 35 stone you have nothing to worry about – if you're a mini-metro, you had best follow the recommended technique and use two Schmoolz just for extra piece of mind.

Remember: Only a fool would tool without a Schmool!

		Product Type
Component	**Item**	**D10**
Complete Tool	Failure Load*	4.63 kN
	Maximum Safe Load	**2.31 kN**
	Maximum Safe Weight (MSW)	**235.55 kg**

* Failure load rating is based on tensile test, subjecting the complete tool to a load of 50 kN per second producing a 'gradually severe pull', increasing it until failure occurs.