

Biker-Mate; a motorcyclist crash cushion for roadside objects

Accident statistics supplied by the UK Department for Transport show that in the 5 years between 2003 – 2007 there were 250 fatalities in motorcyclists colliding with traffic signs, signal poles, lighting columns and telegraph poles and a further 880 serious injuries.

Whilst road conditions, road design or excess speed may be contributory factors we believe an error of judgement, a vehicle malfunction or the wrong ticket in the atmospheric lottery should not lead to a potential death sentence for motorcyclists – but what can be done?

Passively safe structures to prevent serious and fatal injuries to motor car drivers have been available in Scandinavia for 25 years and in the UK since 1995 and there are now over a dozen manufacturers supplying passively safe (break away) sign posts, lighting columns and signal poles.

However, these passive products are designed specifically for car impacts and whilst the huge number of reported non injury road traffic accidents show that these products are extremely successful they do not provide any benefits to the most venerable of road users - motorcyclists.

Signpost Solutions, the company that introduced and spearheaded passively safe structures in the UK with the Lattix mast over 14 years ago have now picked up the baton for motorcyclists and introduced a crash cushion for roadside objects called Biker-Mate.

Biker-Mate, a conceptual idea by Alan Nicholas of Signpost Solutions is manufactured by ERS a division of Encocam Ltd. ERS worked closely with another division within Encocam called Cellbond who are the leading manufacturer of deformable crash test barriers and energy absorbers supplied to car manufacturers worldwide so the expertise to design and produce a mini crash cushion specifically for roadside street furniture was already on tap.

Although originally designed for attachment to quadrangular Lattix passively safe sign masts, it soon became clear that the Biker-Mate structure could be easily adapted for round posts, square posts – in fact almost any shape.

Nicholas comments “the current design which is an ‘L shaped’ construction for fitting to the post for ‘front on traffic flow’ impacts is the obvious use for the product but it could theoretically be deployed on any dangerous free standing roadside structure and there is no reason why in further developments a flat version cannot be designed for fitting to other vulnerable sites such as bridges, brick walls or even the most dangerous of roadside objects – trees”.

Biker-Mate is made up of several layers of pressload sections (imagine an egg carton made out of plastic) inside a polypropylene case which is fitted to the structure by special brackets and steel banding. The pressload layers are ultrasonically welded to ensure maximum interface connectivity which would be an important factor during impact.

Paul Tattersall, Engineering Manager at ERS explains the design process; “Biker-Mate took some significant clues from the automotive safety industry and its years of experience and technological research.

Head injury criteria (HIC) is a recognised injury measure for evaluating the severity of injury for pedestrians and vehicle occupants during an impact. It is also the same measure used to evaluate the effectiveness of motorcycle helmets. In short, the higher the HIC, the higher the chance of severe injury or death.

Specialised headform impactors representing the unprotected human head have been used for years; these can be fired at objects, produce readings and enable HIC to be measured. The same device was used to verify the performance of Biker-Mate.

The following results show significant improvement over the unprotected post/column which would almost certainly have resulted in serious or fatal injuries (in fact these results even exceeded the requirement for pedestrian head protection!).”

Unprotected rigid steel posts/column	4500 – 10300 HIC
Motorcycle helmet (to meet ECE 22.05)	2400 HIC
Biker-Mate Energy absorber	500-1000 HIC

Tattersall concludes “static crush tests and dynamic impact tests were also used to predict the energy absorbing capacity of a modular unit. We found that Biker-Mate is capable of absorbing around 6000J of energy, equivalent to 100% absorption of a 75kg person travelling at over 45kph. This is a significant proportion of energy expected during most collisions taking into account road conditions, typical accident kinematics and typical braking prior to the accident etc”.

Biker-Mate is a patented design, has a large radius impact face, has no sharp edges, comes in modular form for stacking to any height, is extremely light and easy to install and can be fitted with any highly visible reflective material as the photographs (courtesy of Durham CC) show.