

# Protective Equipment for Riders



THE  
MOTOR CYCLE  
INDUSTRY  
ASSOCIATION



European Safer Urban Motorcycling

# Protective Equipment for Riders



Personal Protective Equipment can help motorcycle, scooter and moped riders to reduce the effects of accidents. Nonetheless the benefits offered by motorcycling garments are still widely underestimated. Especially moped riders and commuters in countries with warm climates tend to ignore their benefits in terms of safety and comfort.

While much is being done on PTW (Powered Two-Wheeler) design and rider training, attitude and perceptions regarding protective wear still need to change if improvements in road safety are to be achieved. There is a real need to provide up-to-date and exhaustive information regarding protective equipment to moped and motorcycle riders. Knowledge about the benefits of wearing the correct apparel will help them in making their choice and contribute to their safety.

**Every PTW rider needs to be properly equipped and various stakeholders (PTW industry, dealers, city authorities, rider's organisations, others) can play an important role in informing them and raising their awareness regarding the benefits of a good motorcycling equipment.**

The goal of this guide is to provide some simple guidelines supported by scientific evidence to help increasing the number of motorcyclists equipped with appropriate protective clothing.

## Why every PTW rider should wear protective equipment ?

Fashion and “look” are important factors influencing the user in buying motorcycling apparel. Motorcycling is strongly linked to the idea of freedom, excitement, and strong identity.

Next to these emotional elements every motorcycle, scooter and moped rider should also be aware that there are important safety aspects to consider. Safety concerns should not prevent riders from having fun, riding comfortably or swiftly filtering through cities’ heavy traffic.

Unlike car drivers surrounded by a protective steel cage, motorcycle riders enjoy the feeling of riding in the open air. Unfortunately this sense of freedom has its drawbacks especially in terms of safety in the event of any kind of accident but also when riding in extremely hot or cold weather, when it’s raining, when hit by insects or by debris flung up by other vehicles. It’s for these types of situations, and possible encounters between the rider and the asphalt, that protective equipment was developed.

Protective equipment has two basic purposes: protection and comfort. [In the event of a crash, protective gear will help prevent or reduce injuries.](#)

This brochure is designed to help PTW users make the right choice in relation to: the right fit, the right protection, the right material and the right combination.

Comfortable clothing suited for each individual riding style is essential, it should:

- Offer a degree of protection in the event of an accident
- Keep riders comfortable in hot or cold or wet weather
- Help to make them visible to other road users (conspicuity).

Riding without protective gear is a risk never worth taking. Many riders, especially commuters resist wearing motorcycle clothing because of cost, inconvenience, comfort and lack of knowledge. Many scooter riders do not realize that traveling at low speeds does not mean they are not at risk of serious injury. There is no difference in coming off a scooter at 50 km/h or a motorcycle at the same speed. Scooter riders have exactly the same chances of incurring in injuries such as broken limbs and extensive skin abrasions requiring skin grafts – or worse. It is easy to find suitable protective apparel matching personal style and tastes.

# Evidence based benefits of the Protective Equipment

## > UPPER BODY AND ARMS : JACKETS



**Moped riders**



Light and medium jacket  
**Protection factor: 73%**



Heavy jacket  
**Protection factor: 93%**



**Motorcycle riders**



Light and medium jacket  
**Protection factor: 69%**



Heavy jacket  
**Protection factor: 92%**

According to evidence gathered by MAIDS\*, the most accurate in-depth motorcycle accidents investigation conducted so far, riders wearing appropriate protective gear are likely sustain less injuries if involved in an accident. MAIDS injury statistics are summarized in an indicator to illustrate the advantages of suitable protection gear and better advise riders. The «Protection Factor» indicates the percentage of MAIDS accidents, in which the protective gear has mitigated or even better prevented injuries.

Definitions: Light jacket= thin cotton | Medium jacket= denim, light leather or nylon | Heavy jacket= Kevlar®, imitation or heavy leather

## > LOWER BODY AND LEGS:TROUSERS



**Moped riders**



Light and medium trousers  
**Protection factor: 54%**



Heavy trousers  
**Statistics are not indicative**



**Motorcycle riders**



Light and medium trousers  
**Protection factor: 65%**



Heavy trousers  
**Protection factor: 96%**

**Definitions:** Light trousers = thin cotton | Medium trousers = denim, light leather or nylon  
 Heavy trousers = Kevlar®, imitation or heavy leather

# Evidence based benefits of the Protective Equipment

## > FOOTWEAR



**Moped riders**



Light footwear  
**Protection factor: 50%**



Motorcycle boots  
**Protection factor: 89%**



**Motorcycle riders**



Light footwear  
**Protection factor: 46%**



Motorcycle boots  
**Protection factor: 93%**

Definitions : Light footwear = street shoe, sneaker, training shoe

## > GLOVES



**Moped riders**



Medium gloves  
**Protection factor: 77%**



Heavy gloves  
**Protection factor: 87%**



**Motorcycle riders**



Medium gloves  
**Protection factor: 93%**



Heavy gloves  
**Protection factor: 95%**

**Definitions:** Medium gloves = denim, light leather or nylon | Heavy gloves = Kevlar®, imitation or heavy leather



#### Helmet checklist:

- It bears a clearly visible label indicating ECE type approval.
- It covers rider's forehead and brow
- It doesn't move, slip over rider's eyes or put pressure on his forehead
- Rider's peripheral vision should not be obstructed
- The helmet mustn't cause pressure or impede vision to riders wearing glasses
- Most importantly, it must be comfortable and be correctly fastened.

## Head and face protection

**According to statistics head injuries are the main cause of death and disability amongst PTW riders.**

### Helmets

Helmets are the most important piece of safety equipment, so choosing the right one is essential. Helmets reduce the incidence of fatal head injuries by 50% (source: World Health Organisation).

Helmet usage is compulsory in EU Member States, however in serious accidents almost 20 % of all helmets actually come off when the rider has an accident. There are two main reasons for this:

- The helmet does not fit properly;
- The helmet was not fastened at all, or only very loosely.

**Fastening the helmet correctly must never be forgotten before undertaking any journey.**

Helmets help protect rider's head in many ways. The outer shell resists penetration and abrasion. The equally important impact absorbing liner inside the shell absorbs the shock by slowly collapsing under impact. The soft cloth liner next to the head keeps riders comfortable and the helmet fitting snugly.

**A helmet that has sustained a violent impact should always be replaced.**

Riders should also consider how a full-face helmet makes riding more comfortable. It cuts down on wind noise in the ears and windblast on the face and eyes. It deflects bugs and other objects that fly through the air. A helmet even adds protection from inclement weather and reduces rider fatigue.

### Visors and Goggles

A good quality visor, or goggles, is also essential equipment for the motorcyclist. It is important that the rider maintains a good field of view in all weather and lighting conditions. Riders should also make sure that their visors or goggles match the environmental conditions (daylight, night, rain).

A common problem for motorcyclists is visor misting/fogging. This can be reduced and eliminated in various ways. Helmet ventilation around the visor area is the most common feature to look for and some helmets come provided with anti-mist visor coatings and/or visor inserts that act like double glazing. In many cases, visor inserts are available as an accessory as well as other anti-mist products such as aerosols and other visor treatments.

Riders wearing goggles receive eye protection, but they are not protected from possible injury to other parts of the face.

Goggles, if worn, should be securely fastened over the helmet so they are not blown off. As has been emphasized before, full-face helmets and face shields provide better protection for the entire face.

### Ear plugs

Motorcyclists are subject to many different noises, not just traffic and engine noise. While the helmet will reduce the sound levels produced by the rush of air around them, if they ride for any extended period without adequate further protection they may be putting themselves at risk of hearing damage, which can be prevented with a wide range of ear protections.

Ear plugs offer excellent protection but must be regularly replaced. There are many different makes with different sizes and noise ratings but it is recommended that the rider only buy plugs that are manufactured specifically for motorcycle use.





#### Jacket checklist:

- Bright colours for best visibility to other road users
- It is loose enough to be comfortable but tight enough to keep impact protectors in place
- It keeps the rider comfortable, depending on the conditions the garment is designed for.
- There are wrist fastenings to prevent the sleeves from riding up (56% of injuries occurs to the arms).
- It fits over normal clothing

## 10 Protective Equipment for Riders

### Body protection

#### Clothing

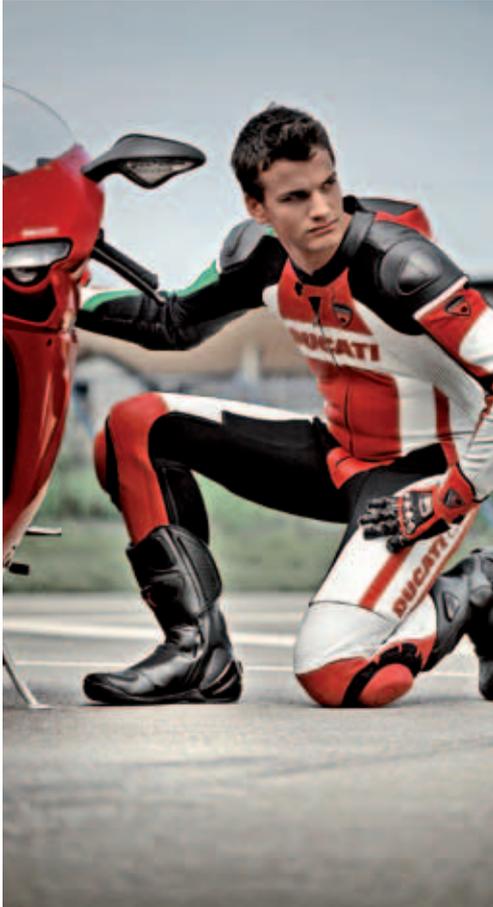
Riders should be encouraged to buy clothing that incorporates fluorescent and/or reflective materials. Reflective clothing shows up well at night when caught in headlamps and on busy motorways in heavy rains fluorescent clothing can really make riders stand out. For the safety of the riders it is important to favour colours providing contrast with the road environment over plain black and camouflage clothing. Alternatively, high visibility reflective over-jackets achieve the same purpose.

#### Jackets

Motorcycle jackets are important in defining a rider's image but are of even greater importance in the event of a crash. When selecting a jacket riders should be persuaded that safety does not come after fashion and look.

#### Gloves

Motorcycle gloves are available in many styles, weights and thicknesses. Lightweight gloves with no padding and possibly some ventilation are more comfortable during the summer or in warm climates while heavier, lined and/or insulated gloves are available for additional protection from winter cold. Motorcycle gloves need to protect riders' hands and wrists without reducing their ability to operate the vehicle. Full-fingered motorcycle gloves protect hands from blisters, wind, sun and cold and will help prevent cuts, bruises and abrasions in a crash.



### Boots

Motorcycle boots protect feet, toes and ankles without affecting the rider's manoeuvring ability. 'Trainers' may be quick and easy but even a minor fall has the potential for serious injury. Riders should consider whether they need to spend more on waterproof boots or to look for additional features such as toe and ankle protectors (replaceable when worn out).

### Gloves checklist:

- Hands and wrists are covered entirely
- The gloves fit snugly
- The gloves are waterproof to ensure hands don't get dangerously cold
- Gloves specifically designed for motorcycling ensure full control over the vehicle

### Boots checklist:

- Entire foot, ankle and lower shin are covered
- The boots are waterproof to ensure rider's feet don't get uncomfortably – and dangerously – cold
- Boots with plastic or metal guards offer more protection in case of accidents.



### Trousers checklist :

- Trousers are loose enough to be comfortable but tight enough to keep rider's impact protectors in place.
- It keeps the rider comfortable, depending on the conditions the garment is designed for.
- They allow for comfortable walking when not riding
- For enhanced safety some models feature removable CE-marked protectors.



## Trousers

Rider's legs are the part of the body most likely to sustain an impact in a crash.

### Body Protectors

Impact protectors are designed for use in motorcycle clothing and may be purchased separately or can be included as original equipment forming part of a garment. The protectors provide protection against injuries caused by impacts with the ground or road surface in motorcycle accidents. Protectors must be CE marked as a proof of compliance with EU standards.

### Benefits of impact protectors :

- In case of accident they prevent some laceration and abrasion that occur when hitting the ground or road surface after falling from a PTW
- They prevent and reduce in the severity of contusions, fractures, muscle stripping and joint damage

### Types of protectors :

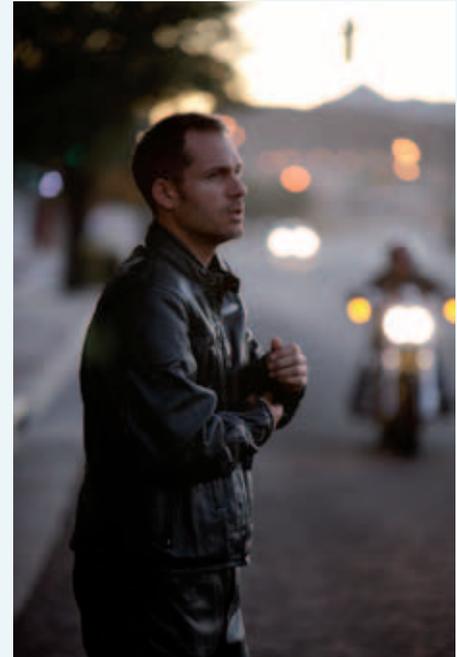
- Arm protector – centred on the elbow and along the line of the ulnar bone to the little finger from about 5 cm above the elbow
- Shoulder protector – from halfway from the shoulder point and the neck down onto the upper arm inclined slightly to the front
- Back protector – centred on the back from the shoulder blades to the waist
- Chest protector covers the rib cage

- Hip protector – symmetrically over the hip bone ensuring that it is high enough to cover the top of the hip bone
- Thigh protector covers both the front and side of the thigh about 10 cm above the knee
- Knee & leg protector – placed over the knee and the shin bone from about 10 cm above the knee.
- Neck brace - helps to prevent extreme forward, rearward and sideways head movement as well as the compression of the spinal column due to the effect of force on the helmet.



**PTW riders should always be advised to purchase protective clothing specifically designed for motorcycling.**

**Protective Equipment does not prevent accidents and injuries in itself. It is the riders' careful behaviour in traffic and a constant risk awareness that prevent being involved in dangerous situations.**



## The eSUM project - European Safer Urban Motorcycling

The European Safer Urban Motorcycling (eSUM) Project is a collaborative initiative between local authorities of the principal European motorcycle cities, the motorcycle industry and universities to identify, develop, demonstrate and promote the wider uptake of measures that are effective in improving the safety of urban motorcycling. The project is co-financed by the European Commission.

As one of the deliverables of eSUM, this leaflet aims at contributing to increase the safety of PTW users by offering clear guidelines on how to effectively choose Personal Protective Equipment.



The eSUM project will lead to the creation of a unique web-based Good Practice Guide for road safety practitioners, providing guidance on good practice projects from across the world in six key areas, including personal protective equipment.

The main purpose of eSUM is to help and encourage local authorities across

EU member states to devise action plans addressing local road safety issues specifically related to PTWs. With the support of a good practice guide and demonstration cases the on-line Action Pack will allow local authorities to follow a process, leading to the establishment of a common urban road safety standard for PTWs, based on the model obtained by the eSUM project.

For more information:

[www.esum.eu](http://www.esum.eu)

*An everyday sight on European roads :  
riders wearing protective garments next  
to not well equipped ones.*

## Evidence based benefits of Protective Equipment for Riders

Source: MAIDS : Motorcycle Accidents In-Depth Study

In order to better understand the nature and causes of PTW accidents, ACEM conducts studies intended to improve the knowledge of PTW accidentology.

PTW riders form one of the most vulnerable groups of road users and road accidents are of growing social concern. Reducing PTW's riders' fatalities in the European Union and achieving the goals of the European Road Safety Charter require solutions and the implementation of policies aiming at fully integrating PTW in mobility plans.

Proper knowledge of how road accidents involving PTWs occur is fundamental to identify the right priorities. With the European Commission's co-funding, ACEM carried out the most comprehensive in-depth study currently available for PTWs accidents in Europe: MAIDS - Motorcycle Accident In-Depth Study. The investigation was conducted during 3 years on 921 accidents from 5 countries.

In order to maintain consistency in the data collected in each sampling area the MAIDS team adopted the methodology developed by the Organisation for Economic Co-operation and Development (OECD) for on-scene in-depth motorcycle accident investigations. The survey produced approximately 2000 variables for each accident. The MAIDS database is made available to external researchers and institutions for

further analysis. Since the publication of the MAIDS report several analysts have referred to MAIDS and partnerships have been built in order to continue to make the most of the data gathered by the MAIDS team.

For more information:

[www.maids-study.eu](http://www.maids-study.eu)





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**eSUM - European Safer Urban Motorcycling - [www.esum.eu](http://www.esum.eu)**

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