

MSA White Paper

How a PPE product may lose its approved protective performance
Key considerations, understanding risks and specifying confidently



The Safety Company



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In today's industry, every piece of PPE is certified, or carries an EU Declaration of Conformity, according to the PPE Regulation (EU) 2016/425. To achieve certification, products must go through intensive and rigorous testing defined in the relevant product norm(s) and meet specified performance requirements to confirm their expected protection level.

So, how can we improve safety?

The reality of workers using PPE highlights two key issues:

A. Some PPE is improperly used or modified once certified, and this poses not only a problem with certification, but a risk to workers.

B. Different types of PPE are combined and used together without testing; by doing this, workers cannot be sure the PPE will perform to original protection levels, and this may result in interference or reduced levels of performance.

Consider with caution - issues to be aware of

In an instance such as those described above, the PPE can lose its certified protective performance without the user being aware. The following is a review of practical examples where a PPE product may lose its certified protection performance and how you can avoid such situations.



1. Decoration of PPE

When you look at construction sites across the globe, there are always workers who personalise their helmets with stickers and permanent marker. It's totally understandable - workers may wear a helmet for more than seven hours per day, and for hygiene and comfort reasons they want to wear the same hat every day. Stickers of favourite football teams or first aid courses are also commonplace. However, this can compromise the safety performance of a helmet.

EN 397 dictates that industrial safety helmets are intended primarily to provide protection to the wearer against falling objects and consequential brain injury and skull fracture. Part of this standard requires manufacturers to define what stickers may be used as, regardless of the material (e.g. HDPE, PC, ABS), sticker glue or solvent from a marker pen could progressively damage the shell material - thereby compromising its performance.

For this reason, the majority of manufacturers prohibit externally produced stickers, while some allow 'flexibility' to use adhesives compatible with the helmet material - of course with the proviso that the manufacturer of the stickers must confirm compatibility.

Considering the myriad of helmets and material mixes on the market, it's virtually impossible for a label manufacturer to test for conformity and compatibility with all PPE out there.

MSA allows users to place labels on its helmets as long as they use water-based glue. MSA's own helmet stickers are designed to resist the most severe conditions (heat, humidity, chemical splashes etc) and pass the hot and cold (+50°C, -30°C) conditioning that is mandatory for EN 397 helmet penetration and shocks tests. The solvent free glue and colourants used ensure that they have no long-term effect on the shell materials.

The advice: stickers and markers that are not tested and offered by the helmet manufacturers should be treated with caution. As the use of alternative stickers/markers can lead to the loss of the helmet's approval, it is advisable to check when selecting a helmet whether the manufacturer provides any required stickers and helmet printing options. MSA offers full-colour printing options and a name label service for all helmet users.



2. Lamp attachments

These are quite often required to give workers better visibility when the lighting isn't optimal. They often have to be ordered with the helmet as lamp attachments are usually fixed on shells during production. The combination must be tested and certified. Users who drill holes in a shell to add a lamp bracket will invalidate approvals - so be careful to ensure the full PPE system is tested, not just elements of it.



3. Dealing with inclement weather conditions

During winter, workers want to keep warm - which can often lead to personal winter warmers being worn underneath helmets. Similarly, in summer, workers may wear baseball caps under the helmets to keep cool.

Unfortunately, users are not generally aware that this effectively changes the helmet positioning and fitting to the head, compromising protection performance and increasing the risk of the helmet falling off - which again invalidates certification. The safest solution by far is to select a helmet with compatible winter or summer liners, where the combination has been tested to the relevant protection standards.

For the winter, MSA Winter Liners deliver extra warmth and protection under safety helmets. For the summer, MSA cooling inserts provide a cooling effect for up to 10 hours, as well as optional neck protection from UV radiation (UPF 50+ approved).

All of MSA's winter liners and summer liners have been tested in combination with our helmets.



4. Chinstraps

These are often required in confined spaces and on scaffolding to keep the helmet on a worker's head during movement. EN 397 requires that helmets and chinstraps are tested in combination. It is not permitted to use an untested combination i.e. a chinstrap from one manufacturer fitted to the helmet from another manufacturer.

In order to make sure full certification is maintained and the worker is protected, PPE Regulation recommends that manufacturers clearly identify the accessories which are compatible with supplied PPE. MSA offers a full range of options and accessories compatible and certified with V-Gard® and ThermalGard industrial helmets.



5. Protection from noise

85 dB(A) is the European safe working level for noise. This is often exceeded at construction sites, so hearing protection is needed. However, incidents have been reported where a helmet is discarded in favour of headband mounted ear defenders, meaning that the worker is put at risk of head injury from falling objects.

Some simply wear ear defenders in the neckband position - but again if the defender was not designed or certified as a neckband, the ear cup tightness or contact pressure will not be maintained - meaning the protective performance will be lower than certified.

Attaching helmet mounted ear defenders to a helmet for which they are not certified may change the pressure due to shell size and shape. According to EN 352, the hearing protection manufacturer must decide which helmets they

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are going to certify in combination with their earmuffs. Consequently, you should always check when selecting a helmet that there is a certified hearing protection combination and that both suit your uses. This information is typically available in the manufacturer's ear defender product manual and/or datasheet. Users also need to check that the correct helmet mounting adapters are used for their helmet.

It all comes back to using recommended and certified PPE systems - helmet mounted earmuffs specified with a specific helmet. This is the only way to be sure the attenuation levels of earmuffs can be achieved.



6. Eye protection

On many construction sites, eye protection is mandatory at all times for workers. When a user removes eye wear because it does not fit in combination with earmuffs, a chin strap or a respiratory mask, they risk eye injury and even loss of sight. Even using a classic spectacle with standard temple arms in combination with earmuffs can cause a gap in sealing cushions - reducing levels of protection and invalidating certification. To prevent this, users should look for spectacles with a head band or very thin, tight-fitting temple arms - the best option is to choose a helmet with integrated over-spectacles which has been approved with chinstrap and earmuffs. Moreover, with such integrated safety solution, you'll keep workers reliably protected, increase helmet compliance, and hopefully put an end to comments like: "I've left my safety specs in the car."



7. Face protection

Is also often necessary. European standard EN 166 is the standard relating to protective eye protection. It requires that visors are always certified with matching frames - unmatched combinations are not allowed, even if the pieces fit together.

Frequently visors/frame sets are combined with a helmet from another manufacturer. Although this is not absolutely prohibited in EN 166, the exact protective performance of the visor cannot be confirmed and may be easily dislodged and fail to meet the standard.

If visor mounting to the helmet or changing is difficult, this increases the risk that the visor won't be worn at all. Therefore, it is critical that visor, frame and helmet are developed and certified in combination and can be quickly combined or disassembled as the situation changes. Note that, some safety helmets on the market have an integrated accessory rail integrated to their shell, thus eliminating the need to add an external frame to attach a visor (or spectacles)! Also, helmets with integrated full-face visor will offer the benefit of 2 PPE wrapped into 1...with a visor well protected in the helmet's shell when not used.





8. Filtering respiratory protection

Is needed for specific construction/industrial applications. When wearing masks and goggles in combination it is important to check that temples and nose pads don't create any leaks. When combining masks and visors the wearer should consider the adjustability of the distance between the visor and face as the mask needs to fit behind the visor. Users should also consider when wearing full face masks and helmets that adjustment of the helmet height is critical to ensure that the mask harness fits under the helmet and both remain securely on the head.



Knowledge is power

The above scenarios give a small insight into the complex world of worker safety and PPE. Ultimately, whether decision maker or end user, we are all working toward to the same goal. We all have a duty of care and a responsibility to do our utmost to make sure workers go home safely at the end of each day. Of course, accidents may happen, but with the right measures and behaviours in place we can protect against the impacts of them.

Compromised protective performance for PPE isn't an option. It's all about knowing what is required, being prepared, asking the right questions and only settling for fully compliant and certified PPE.

We'll leave you with a few key questions to help in your next PPE specification:

- What protection is required?
- Are all the elements compatible?
- Has the PPE been fully tested on its own and as part of the system that will be used?
- Are you certain that in the case of an incident, certification can be proved?

If you fully understand the first question and can wholeheartedly answer yes to the remaining three, then you are doing your job to the best of your ability. When lives are at stake we must be prepared. This is how we can keep people safe.










Visit [MSAsafety.com](https://www.MSAafety.com) to learn more about our approved safety solutions and feel free to contact us for further information MSA.Industry.Marketing@msasafety.com



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European Industrial Helmets - Approved Accessories & Options

V = certified combination covered by the helmet certificate and the helmet Declaration of Conformity

Accessory or Option											
			V-Gard*	V-Gard 200	V-Gard 500	V-Gard 520	V-Gard H1*	V-Gard 930	V-Gard 950*	V-Gard 950 Class 2	ThermalGard
Suspensions	10162752 10162755	Fas-Trac® III PVC Fas-Trac® III Foam	✓	✓	✓	✓	×	×	×	×	×
	10162507 10162508	Push-Key PVC Push-Key Foam	✓	✓	✓	✓	×	×	×	×	×
	10194760	Fas-Trac® III Pivot Foam for V-Gard H1	×	×	×	×	✓	×	×	×	×
	10162753	Fas-Trac® III PVC for ThermalGard	×	×	×	×	×	×	×	×	✓
	GA90041	Fas-Trac® III Foam for V-Gard 900 series	×	×	×	×	×	✓	✓	✓	×
Sweat band for suspensions	696688	Cleanable Terri sweatband	✓	✓	✓	✓	×	✓	✓	✓	✓
	10153518	Fas-Trac® III Foam sweatband	✓	✓	✓	✓	×	✓	✓	✓	×
	10194761	Fas-Trac III Pivot Foam Sweatband	×	×	×	×	✓	×	×	×	×
	3335612-SP	Push Key Foam sweatband	✓	✓	✓	✓	×	×	×	×	×
Chinstraps	B0259378	2 pts elastic	✓	✓	✓	✓	×	×	×	×	×
	9100001	2 pts zebra	✓	✓	✓	✓	×	✓	×	×	✓
	GA90047	4 pts Universal	✓	✓	✓	✓	×	✓	✓	✓	✓
	GA90040	Chincup for universal 4-pt chinstrap	✓	✓	✓	✓	×	✓	✓	✓	✓
	10148055	4 pts zebra for V-Gard 500 & 520	×	×	✓	✓	×	×	×	×	×
	10194766	4 pts for V-Gard H1 Novent & Bivent (EN397)	×	×	×	×	✓ (Novent & Bivent)	×	×	×	×
	10194765	4 pts for V-Gard H1 Trivent (EN12492)	×	×	×	×	✓ (Trivent)	×	×	×	×
Lamp brackets	-	Front Plastic lamp bracket	✓	✓	✓	✓	Universal clips for head lamps	×	×	×	×
	-	Front Metal lamp bracket	✓	✓	✓	✓		✓	×	×	×
	-	Side plastic lamp bracket	✓	✓	✓	✓		×	×	×	×
Summer liners	GA90022	UPF 50+ Crown cooler	✓	✓	✓	✓	✓	✓	✓	✓	✓
	GA90023	UPF 50+ Crown cooler with neck shade	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Do not use summer liners for any electrical work as they're activated with water! Do not use crown cooler with neck shade when molten metal risk application!										
Winter liners	10118417	V-Gard Value Liner Knit Cap	✓	✓	✓	✓	✓	✓	✓	✓	✓
	10118418	V-Gard Value Liner Knit Hat-Cap Cover	✓	✓	✓	✓	✓	✓	✓	✓	✓
	10118427	V-Gard Supreme Liner	✓	✓	✓	✓	✓	✓	✓	✓	✓
	10118424	V-Gard Select Liner, Extended, Bright with Reflective Striping	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Do not use winter liners when molten metal risk application!										

* Delivered with chinstrap

Accessory or Option											
			V-Gard®	V-Gard 200	V-Gard 500	V-Gard 520	V-Gard HI*	V-Gard 930	V-Gard 950*	V-Gard 950 Class 2	ThermalGard
Neck protection	GA90005	PVC fluo orange neck cape	✓	✓	✓	✓	✓	✓	✓	✓	✓
	TI900700	Nomex orange neck cape	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ear-flaps	GA90033	V-Gard 950 Arc-Flash Ear-flaps	✗	✗	✗	✗	✗	✗	✓	✗	✗
	GA90053	V-Gard 950 Class 2 Extended arc-flash ear + neck flaps	✗	✗	✗	✗	✗	✗	✗	✓	✗
Logo cus- tomization	-		✓	✓	✓	✓	✓	✓	✓	✓	✓
Stickers	Various colours and shapes available	Microball retroreflective stickers (vinyl and textile)	✓	✓	✓	✓	✗	✗	✗	✗	✗
	- (standard)	Retroreflective gun metal grey stickers for V-Gard HI series	✗	✗	✗	✗	✓	✗	✗	✗	✗
	GA90036 (grey) GA90037 (red) GA90056 (green) GA90057 (yellow) GA90058 (blue)	Retroreflective stickers for V-Gard 900 series	✗	✗	✗	✗	✗	✓	✓	✓	✗
	GA90025 GA90029	Individual naming sticker	✓	✓	✓	✓	✗	✓	✓	✓	✗
	-	Badge holder	✗	✗	✓	✓	✗	✗	✗	✗	✗
Badge holder	-	Badge holder for V-Gard 900 series	✗	✗	✗	✗	✗	✓	✓	✓	✗
	-	Badge holder	✗	✗	✓	✓	✗	✗	✗	✗	✗
Eye & face protection	Various	All range of products: frames, visors and chin protectors**	✓	✓	✓	✓	✗	✗	✗	✗	✓
	10194820	V-Gard HI Spectacles**	✗	✗	✗	✗	✓	✗	✗	✗	✗
	10217333	Tinted V-Gard HI Spectacles**	✗	✗	✗	✗	✓	✗	✗	✗	✗
	10194818	V-Gard HI Clear visor**	✗	✗	✗	✗	✓	✗	✗	✗	✗
	10194819	V-Gard HI Mesh visor**	✗	✗	✗	✗	✓	✗	✗	✗	✗
Helmet mounted ear defenders	Various	V-Gard passive**	✓	✓	✓	✓	✓	✓	✓	✗	✓
		left/RIGHT electronic**	✓	✓	✓	✓	✗	✓	✓	✗	✓

* Delivered with chinstrap

** These products have their own certificate

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Accessory or Option			 V-Gard®	 V-Gard 200	 V-Gard 500	 V-Gard 520	 V-Gard H1*	 V-Gard 930	 V-Gard 950*	 V-Gard 950 Class 2	 ThermalGard
Face shield	GA90034	Replacement face shield with connection rails for V-Gard 950	×	×	×	×	×	×	✓	×	×
	GA90051	Replacement face shield with connection rails for V-Gard 950 Class 2	×	×	×	×	×	×	×	✓	×
Over-spectacles	GA90035	Replacement V-Gard 930 over-spectacles with adapters	×	×	×	×	×	✓	×	×	×

MSA – The Safety Company

Our business is safety. We've been the world's leading manufacturer of high-quality safety products since 1914. MSA products may be simple to use and maintain, but they're also highly-sophisticated devices and protective gear – the result of countless R&D hours, relentless testing and an unwavering commitment to quality that saves lives and protects thousands of men and women each and every day. Many of our most popular products integrate multiple combinations of electronics, mechanical systems and advanced materials to help ensure that users around the world remain protected in even the most hazardous of situations.

Our Mission

MSA's mission is to see to it that men and women may work in safety and that they, their families and their communities may live in health throughout the world.

MSA: We Know What's at Stake.

Note: This Bulletin contains only a general description of the products shown. While product uses and performance capabilities are generally described, the products shall not, under any circumstances, be used by untrained or unqualified individuals. The products shall not be used until the product instructions/user manual, which contains detailed information concerning the proper use and care of the products, including any warnings or cautions, have been thoroughly read and understood. Specifications are subject to change without prior notice.

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