

# High Visibility Apparel: Providing Protection, Safety, Comfort and Style

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## **Abstracts**

High visibility apparel plays a critical role in making the jobs of those who work in hazardous environments safer. Indeed, high visibility apparel is a key category of the industrial protective clothing market—a sector which is expected to achieve significant growth between 2016 and 2021 as safety awareness increases and industrialisation proceeds in developing countries. High visibility apparel is also being used increasingly to minimise risks by members of the public who use the roads—including vehicle drivers and cyclists. Wearers of safety apparel are able to choose from a variety of high visibility garments, including those which incorporate fluorescent materials and/or retroreflective materials. Additionally, advances in wearable technology have facilitated the development of garments which incorporate light emitting diodes (LEDs). Furthermore, while safety is considered to be of the highest importance in the design of high visibility protective apparel, style and comfort are also key. Indeed, several high visibility garments are designed so that they facilitate performance properties such as moisture wicking, or are styled in a way which is similar to conventional casual apparel. However, the use of high visibility materials is by no means restricted to safety apparel as retroreflective materials are being used increasingly to add attractive design details to casual apparel. This report provides a wealth of information on high visibility apparel, including the types of high visibility material used in the design and construction of causal apparel. The report also features information on: the development and application of high visibility materials; the latest developments in high visibility products; regulations and standards relating to high visibility apparel; and the outlook for the high visibility apparel market.



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Risks to personal safety faced by motorcyclists

Risks to personal safety faced by cyclists

Risks to personal safety faced by participants in sports and recreation

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Fluorescence

Retroreflection

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Glass bead technology

Microprismatic technology

Light emitting diodes



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Design of high visibility personal protective equipment (PPE)

Designing athleisure and general outdoor apparel

Making the best use of retroreflective materials

**Brightness** 

Area

**Placement** 

Size

Biomotion

Assessing the overall visibility of a garment incorporating retroreflective materials Visibility Rating Score (VRS)

# USE AND MAINTENANCE OF HIGH VISIBILITY APPAREL APPLICATIONS OF HIGH VISIBILITY MATERIALS

Industrial protective apparel

Promotional apparel

Corporate apparel

Athleisure apparel, sportswear and recreational wear

Casualwear, children's wear and fashion wear

Casualwear and children's wear

Fashion wear

#### LEGISLATION AND STANDARDS RELATING TO HIGH VISIBILITY APPAREL

Legislation governing the use of high visibility apparel for occupational purposes Non-compliance with safety regulations

Legislation governing the use of high visibility apparel for non- occupational purposes Standards for high visibility apparel

EN ISO 20471:2013 ANSI/ISEA 107-2015

#### INNOVATIONS IN HIGH VISIBILITY MATERIALS

Retroreflective sewing threads

American & Efird (A&E): Anefil Reflector



Coats: Coats Signal sewing thread

Reflective materials 3M: 3M Scotchlite

Orafol: Oralite

Regine IQtrim: IQperform and IQseen

Safe Reflections: Brilliant Color Reflective, Eclipse and Airex Segmented retroreflective

technologies

Viz Reflectives: VizLite Dual Technology

High visibility fabrics

Argar Technology: HVis-Tes, HVis-Tes 2.0, HVis-Tes esd, Noflam-HV and Tes-fir ESD-

HV

**DuPont: Nomex ProVis** 

Glen Raven: GlenGuard Hi-Vis

TenCate Protective Fabrics: TenCate Tecasafe Plus

Teijin Limited: high visibility fabric made from aramid fibre

#### INNOVATIONS IN HIGH VISIBILITY PRODUCTS

Bulwark: iQ Series Comfort Knit ANSI Hi-Visibility Long Sleeve Henley shirt

Fhoss Technology: FiSalus Safety Trousers

Lumo: Herne Hill Harrington Jacket

National Safety Apparel (NSA): Class 2 Hi-Vis FR Control 2.0 Base Layer Tee

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