mallcom®

Personal Protective Equipment

Collection 2025

mallcom®

74
Body
Protection

96
Feet
Protection

About us

Our Vision

Mallcom's vision is to reach the highest levels in quality, innovation, reliability and perfection, through its products. We believe that our integrity is what will carve out a firm presence for us in the world of PPE.

Who are we?

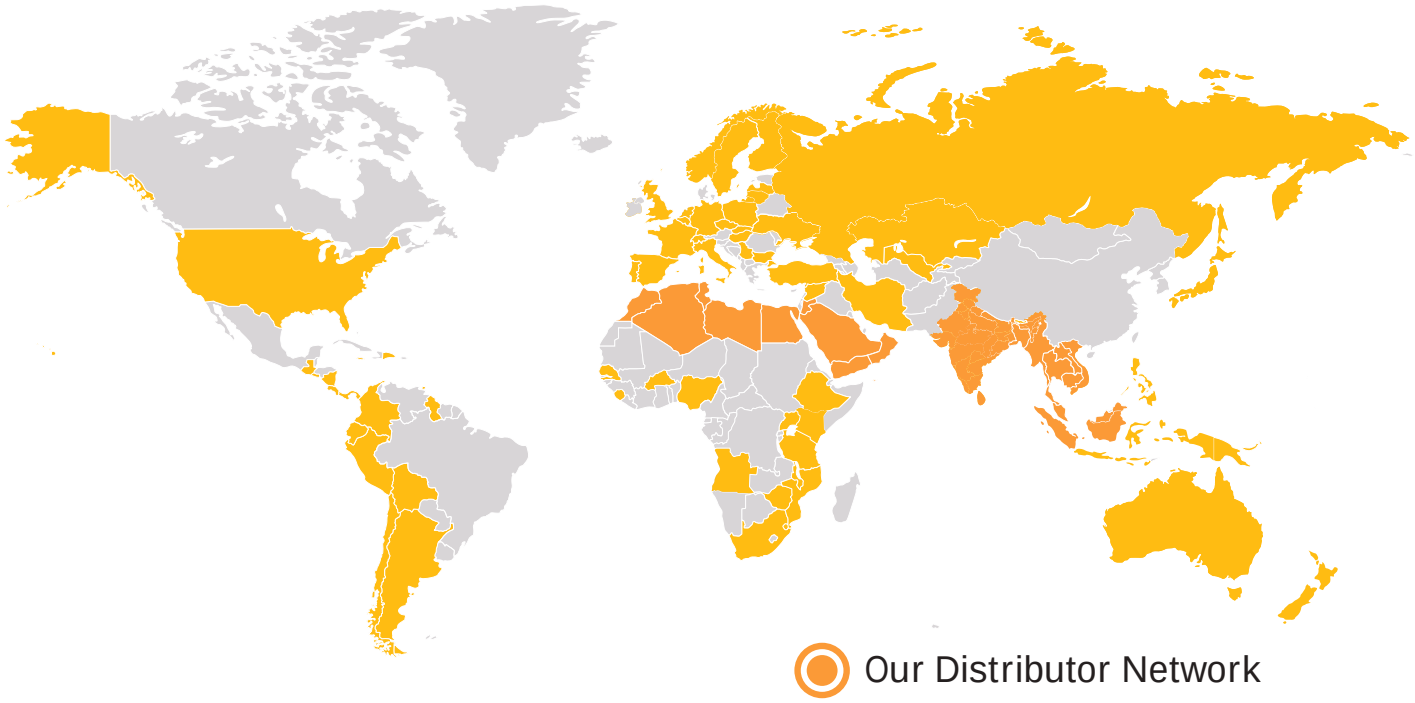
Mallcom India Limited, is a pioneer in Personal Protection Equipment (PPE). We have been manufacturing, exporting and distributing a wide range of head-to-toe Personal Protective Equipment (PPE) since 1983. At Mallcom, our assortment of safety gear offers our clients a one-stop solution for all the safety concerns.

As an integrated manufacturer of PPE, we offer an entire line of affordable PPEs, without compromising on quality. This has been one of the main reasons, why our reliability on the quality of protection and safety equipment has been esteemed in the industry. Leveraging our experience, we feel confident that we will always exceed our customers' expectations in meeting their needs.

Needless to say, we also take great pride in our ability to customise our products according to the required specifications. With a goal to provide every workforce the world of superior products at the most competitive prices, our products are designed with the finest materials and crafted with attention-to-detail.

Our clients' trust and satisfaction are our greatest profits; and when it comes to serving our clients the best of our abilities, we hold as an essential tenet that we are a 'No Compromise' company. Mallcom India Limited is an ISO 9001:2008 certified and SA 8000:2008 compliant company.

We are here



40+ Years of Protecting Industrial Workers Worldwide

13 Manufacturing Units Across India

50+ Countries

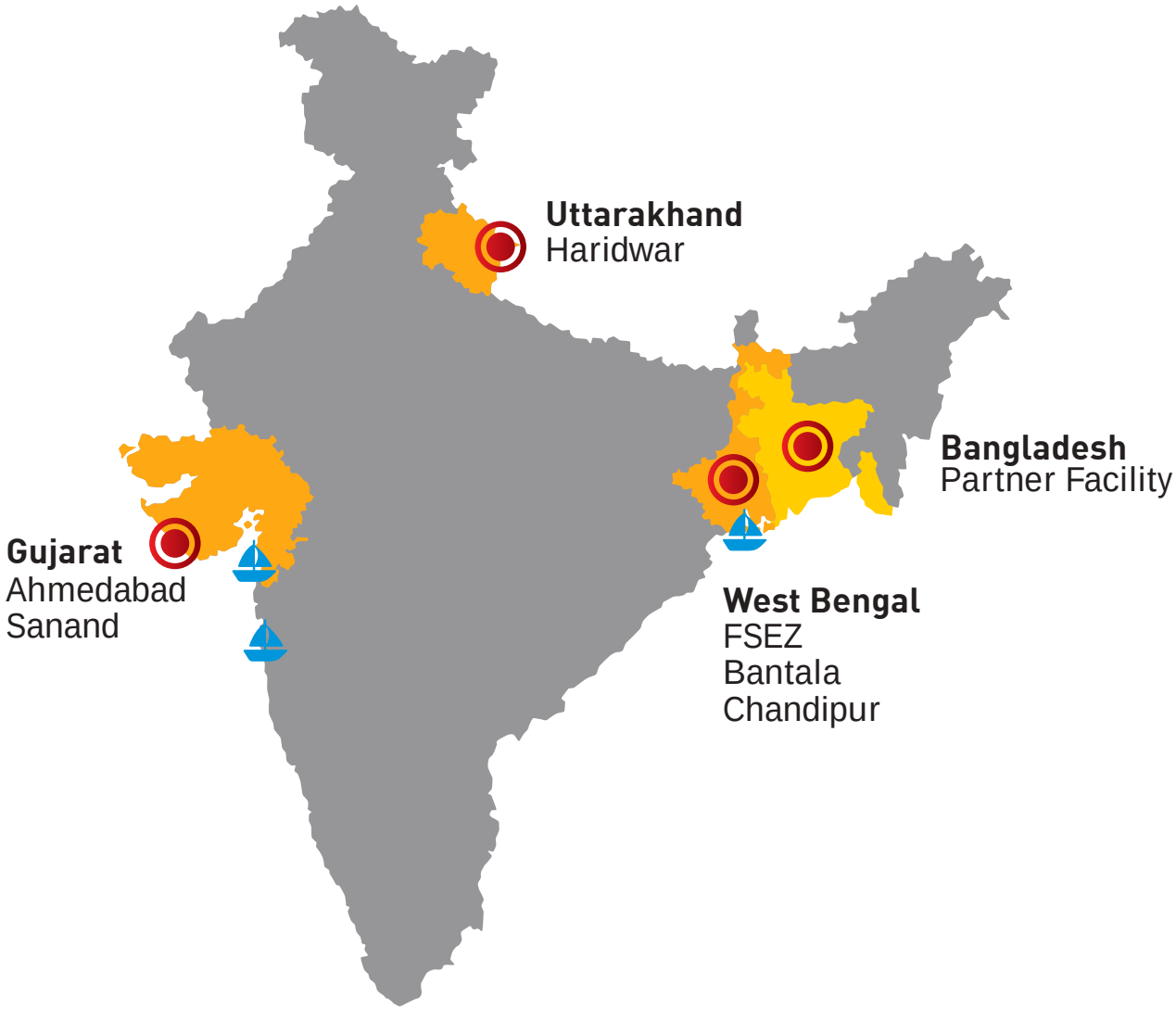
6 Continents

80+ Distributors

Global Footprint

Mallcom is present across 50+ nations worldwide. Through the years our innovative products have made us leader in the field of Personal Protective Equipment. We share our knowledge and progress regularly with dealers to ensure the best experience for our clients.

We make, we move



Manufacturing units | Sea ports

Product Accreditations

Facility Accreditations

Head Protection

We excel in providing advanced protective headgear at Mallcom. Made with durable UV-HDPE material for superior UV resistance, our headgear ensures safety and comfort in various industrial applications. Our products offer the ultimate PPE solution, combining cutting-edge technology with ergonomic design. Trust Mallcom for top-notch head protection and experience the perfect blend of safety and comfort. Secure your peace of mind with Mallcom's premium protective headgear.

- SAFETY HELMETS
- BUMP CAPS
- SAFETY EYEWEAR
- SURGICAL MASKS
- FACE MASKS
- EARPLUGS

mallcom®

SAFETY HELMET

JASPER V

Non ventilated polypropylene (PP) shell material
LDPE harness lining with 2 bands and 4 attachment points
Head measurement adjustable with zip fastener


LDPE Harness


Cable Clip


Lamp Bracket

Chin Strap

Green Orange Red Blue Yellow White Violet

IS 2925

72

52-60 cm

JASPER I

Non ventilated UV-resistant HDPE shell
LDPE harness lining with 2 bands and 4 attachment points
Zip adjustment and sweat absorbent sweatband

52-60 cm IS 2925 72

JASPER II

Non ventilated UV-resistant HDPE shell
LDPE harness lining with 4 attachment points
Ratchet adjustment and sweat absorbent sweatband

52-60 cm IS 2925 72

JASPER III

Non ventilated UV-resistant HDPE shell
Textile harness lining with 2 bands and 4 attachment points
Zip adjustment and sweat absorbent sweatband

52-60 cm IS 2925 72

JASPER IV

Non ventilated UV-resistant HDPE shell
Textile harness lining with 2 bands and 4 attachment points
Ratchet adjustment and sweat absorbent sweatband

52-60 cm IS 2925 72

DIAMOND I

Non ventilated UV-resistant HDPE shell
Textile lining with 3 bands and 8 attachment points
Adjustable zip and sweat absorbent sweatband

53-63 cm IS 2925 EN 397 40

DIAMOND II

Non ventilated UV-resistant HDPE shell
LDPE lining with 3 bands and 8 attachment points
Adjustable zip and sweat absorbent sweatband

53-63 cm IS 2925 EN 397 40

Diamond III

Non ventilated UV-resistant HDPE shell
Textile lining with 3 bands and 8 attachment points
Adjustable ratchet and sweat absorbent sweatband

53-63 cm IS 2925 EN 397 40

Diamond IV

Non ventilated UV-resistant HDPE shell
LDPE lining with 3 bands and 8 attachment points
Adjustable ratchet and sweat absorbent sweatband

53-63 cm IS 2925 EN 397 40

DIAMOND IV HI-VIS

Non ventilated UV-resistant HDPE shell
LDPE harness with 3 bands and 8 attachment points
Reflective tape on the side and back
Equipped with a sweatband and adjustable ratchet

53-63 cm IS 2925 EN 397 40

DIAMOND V

Non ventilated UV-resistant ABS shell
Textile nylon harness with 3 bands and 8 attachment points
Sweatband and shock pad with ratchet adjustment

53-63 cm IS 2925 EN 397 AS/NZS 1801 40

DIAMOND XII

Ventilated UV-resistant HDPE shell
Textile lining with 3 bands and 8 attachment points
Sweatband & shock pad with ratchet adjustment

53-63 cm IS 2925 EN 397 40

DIAMOND XIII

Ventilated UV-resistant HDPE shell
LDPE with 3 bands and 8 attachment points
Sweatband and shock pad with ratchet adjustment

53-63 cm IS 2925 EN 397 40

SAFETY BUMP CAP

SAPPHIRE G

Lightweight and impact-resistant bump cap
EVA reinforcement for cushioning
Black HDPE shell

Breathable Mesh

Baseball Style Cap

Reflective Tape

Sapphire SP O

Sapphire SP B

Sapphire G Blue

CE
EN 812

52-56 cm

SAPPHIRE SP B

Lightweight, impact-resistant short peak baseball style bump cap
Polycotton outer cover with breathable mesh
Black HDPE shell and EVA reinforcement for cushioning

52-56 cm EN 812 40

TOPAZ HI VIS

Lightweight Impact resistant baseball type bump cap
Polycotton outer cover with breathable mesh
Grey coloured ABS shell and EVA reinforcement for cushioning

58-62 cm EN 812 40

TOPAZ O

Lightweight Impact resistant baseball type bump cap
Polycotton outer cover with breathable mesh
Grey coloured ABS shell and EVA reinforcement for cushioning

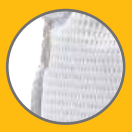
58-62 cm EN 812 40

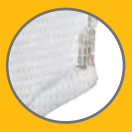
SAFETY HALF MASK

M1202P

Disposable FFP2 half face mask
Foldable type nose clip for a better fit
Head loop elastic fastening system


Foldable
Nose Clip


Head Loop


Ultrasonically
Sealed


White Yellow Grey

CE
EN 149

200

M2102P

Disposable FFP1 half face mask
Ultrasonically sealed with foldable nose clip
Head loop elastic fastening system
Available with/without valve

IS 9473 EN 149 200

M3102PV

Disposable FFP1 half face mask
Ultrasonically sealed with foldable nose clip
Head loop elastic fastening system
Available with/without valve

IS 9473 EN 149 200

M1202PV

Disposable FFP2 half face mask
Ultrasonically sealed with foldable nose clip
Head loop elastic fastening system
Available with/without valve

IS 9473 EN 149 200

SAFETY HALF MASK

L1202PV

Aesthetically designed foldable FFP2 face mask
Particulate matter filtering half mask with valve
Ultrasonically sealed mask with/without valve


Head Loop


Valve


Concealed Nose Clip


White


Yellow


Grey

IS 9473 EN 149

200

L2102PV

Aesthetically designed foldable FFP1 face mask
Particulate matter filtering half mask
Ultrasonically sealed mask with/without valve

IS 9473 EN 149 200

L1102P

Aesthetically designed foldable FFP1 face mask
Particulate matter filtering half mask
Ultrasonically sealed mask with/without valve

IS 9473 EN 149 200

L3202P

Aesthetically designed foldable FFP2 face mask
Particulate matter filtering half mask
Ultrasonically sealed mask with/without valve

IS 9473 EN 149 200

SAFETY HALF MASK

L3103P

Aesthetically designed foldable FFP1 face mask
Particulate matter filtering half mask without valve
Concealed nose clip and ultrasonically sealed

Ear Loop

Concealed Nose Clip

Ultrasonically Sealed

Grey

Yellow

White

IS 9473

CE EN 149

200

L2103PV

Aesthetically designed foldable FFP1 face mask
Particulate matter filtering half mask with valve
Concealed nose clip and ultrasonically sealed

IS 9473 EN 149 200

L1203PV

Aesthetically designed foldable FFP2 face mask
Particulate matter filtering half mask with valve
Concealed nose clip and ultrasonically sealed

IS 9473 EN 149 200

L1203P

Aesthetically designed foldable FFP2 face mask
Particulate matter filtering half mask without valve
Concealed nose clip and ear loop fastening

IS 9473 EN 149 200

L3302PV

Aesthetically designed foldable FFP3 face mask
Particulate matter filtering half mask with valve
Concealed nose clip and ultrasonically sealed

IS 9473 EN 149 200

L2302P

Aesthetically designed foldable FFP3 face mask
Particulate matter filtering half mask without valve
Concealed nose clip and ultrasonically sealed

IS 9473 EN 149 200

L2302PV

Aesthetically designed foldable FFP3 face mask
Particulate matter filtering half mask with valve
Concealed nose clip and ultrasonically sealed

IS 9473 EN 149 200

CK86P3

Pleated disposable 3-layered surgical mask
Concealed nose clip offers snuggly fitting
Ultrasonic sealing and elastic ear loops

IS 16289 EN 14683 200

CM86P3

Pleated disposable 3-layered surgical mask
Concealed nose clip offers snuggly fitting
Ultrasonic sealing and elastic ear loops

IS 16289 EN 14683 200

LK86L3

Aesthetically designed pleated disposable three layer hygiene mask
Conceal nose clip offers snuggly fitting
Ultrasonic selling and elastic ear loops

IS 16289 EN 14683 200

SAFETY EYEWEAR

AVIOR

Safety goggles with integrated soft nose piece
Removable foam for shock and dust protection
Individual goggles case with padded lens holder chamber

Interchangeable lens

Removable foam

Detachable temple

Focus Yellow

Cool Blue

Classic Grey

Glamour Brown

CE
EN 166

100

ALTAIR

Safety goggles with polycarbocate frame
Two interchangeable lenses with colour option
Temples can be replaced with elastic headband

EN 166 | 100

ORION

Safety goggles with polycarbocate frame
Removable eyebrow protector
Temples can be replaced with elastic headband

EN 166 | 100

VEGA

Safety goggles with polycarbonate frame
5 different colour options for lenses
Removable eyebrow protector

EN 166 | 100

PLUTO

Clear polycarbonate single lens glasses
Adjustable and fitting nylon arms
Arms with holes for neck cord

EN 166 | 250

LEPUS

IR3.0 polished welding glasses
Speciality 3.0 ultraviolet infrared protective glasses
Can be used during welding gas cutting operation

CE EN 169 | 100

MONOCEROS

IR5.0 polished welding glasses
Speciality 5.0 ultraviolet infrared protective glasses
Can be used during welding gas cutting operation

CE EN 169 | 100

CIRRUS

Clear polycarbonate goggles
Flexible PVC frame with indirect ventilation
Woven elastic strap

UV | CE EN 166 | 120

AGENA

Clear polycarbonate lens
Polypropyleene frame
Polyester and rubber elastic strap for ventilation

UV | CE EN 166 | 250

ORBIT

Clear polycarbonate body
Single lens glasses
Soft and flat spatula-type arms

EN 166 250

APOLLO

Clear polycarbonate single lens glasses
Direct side ventilation
Arms with holes for neck cord

EN 166 250

ULTRA AGENA

Toughened polycarbonated lens
Lightweight soft PVC frame with internal lateral vents
Woven elastic strap

EN 166 250

ULTRA CIRRUS

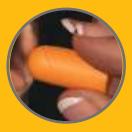
Clear polycarbonate goggles
Flexible PVC direct ventilation
Flexible PVC frame with woven elastic strap

EN 166 120

SAFETY EARPLUGS & EARMUFFS

SN500P

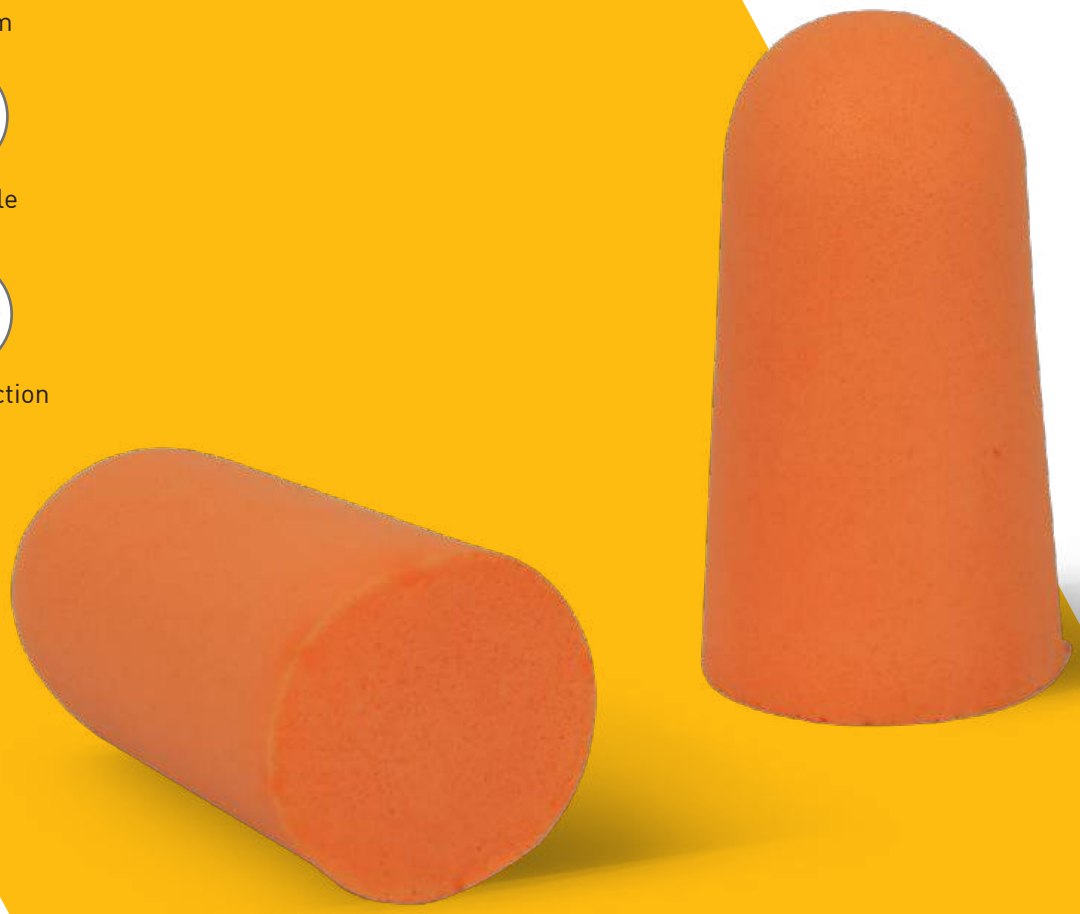
Uncorded PU foam earplugs
SNR value of 34 ensures effective noise reduction



PU Foam

Disposable

Noise Reduction



Access from here

CE
EN 352-2

4000

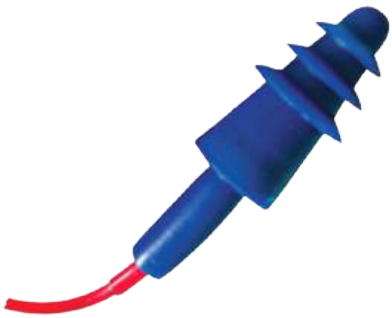
SN03PC

PU earplug with nylon/PVC cord
SNR value of 34 ensures effective noise reduction

CE EN 352-2 5000

SN03SP

Silicon earplugs with PVC cords
SNR value of 34 ensures effective noise reduction



CE EN 352-2 5000

AVIATOR

Sweat absorbent headband earmuffs for enhanced comfort
SNR value of 28 ensures effective noise reduction

CE EN 352-1 40

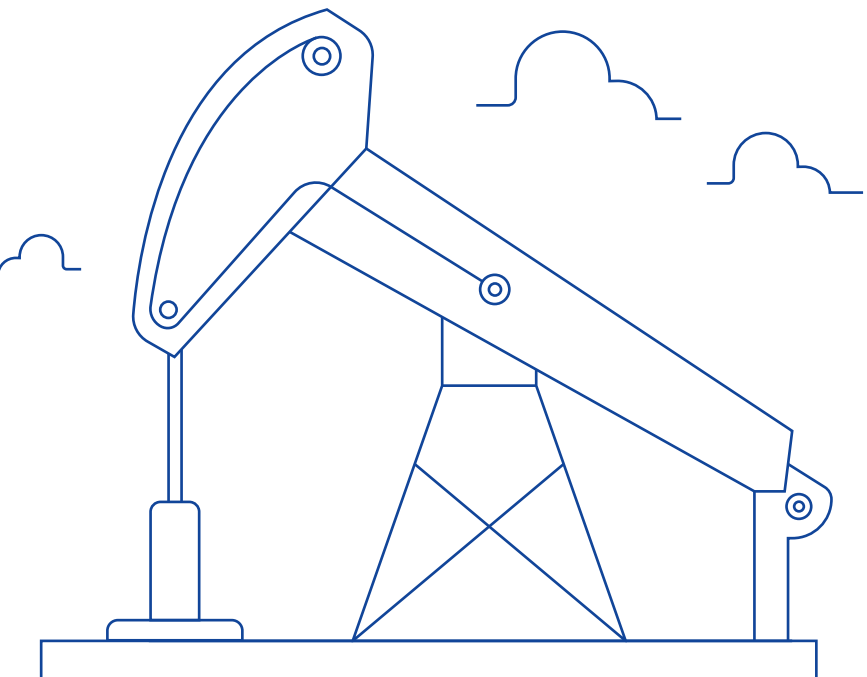
COMFY MUFF

Sweat absorbent headband earmuffs for enhanced comfort
SNR value of 32 ensures effective noise reduction

CE EN 352-1 40

Hand Protection

We excel in producing high-quality hand gear for a wide range of applications, including driving, welding and cut resistance. Our extensive collection of hand protection solutions features durable leather gloves, flexible string knit gloves, and resilient nitrile-supported gloves, all available in both cut- and-stitch and seamless designs. Engineered for optimal protection and performance, our gloves are designed to meet the diverse needs of various work environments.

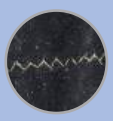


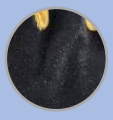
mallcom®

DRIVER GLOVES

D692

Aesthetically designed combined driver gloves
Yellow grain palm with black split leather back
Elasticised back for snuggly fitting
Synthetic binding tape


Elasticised Back


Black Split Leather Back


Yellow Grain Palm

CE
EN 388 - 2122X 7-11

120

D232

Natural grain driver gloves
Wing thumb pattern
Elasticised back
Synthetic binding tape

CE EN 388 - 2122X 7-11 120

D591

Natural split driver gloves
Wing thumb pattern
Elasticised back
Synthetic binding tape

CE EN 388 - 3133X 7-11 120

D662

Natural combined driver gloves
Yellow grain palm with black split leather back
Elasticised back for snuggly fitting
Synthetic binding tape

CE EN 388 - 2132X 7-11 120

BE22J1

High performance natural grain driver gloves
Filament steel blended para-aramid lining
Elasticised back
Synthetic binding tape

CE EN 388 - 3542F 7-11 120

BE2258

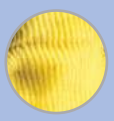
High performance natural grain driver gloves
Fibreglass blended para-aramid lining inside
Impact resistant padding is stitched on back
Elasticised back for snuggly fitting

CE EN 388 - 3542DP 7-11 120

CANADIAN GLOVES

C592

Dyed black split leather Canadian glove
Cotton fleece lining
Cotton drill fabric back
Rubberised cuff



Cotton Fleece Lining

Dyed Black Split Leather

Cotton Drill Fabric

CE
EN 388 - 3123X 7-11

120

C232R

Palm reinforced natural grain Canadian gloves
Cotton fleece lining
Stripped cotton drill fabric back
Rubberised cuff

CE EN 388 - 4233X 7-11 120

C542

Dyed blue split leather Canadian gloves
Cotton fleece lining
Cotton drill fabric back
Rubberised cuff

CE EN 388 - 3132X 7-11 120

C853

Palm reinforced split Canadian gloves
Cotton fleece lining
Cotton drill fabric back
Rubberised cuff

CE EN 388 - 4344X 7-11 120

C893

Dyed black split Canadian gloves
Yellow split Palm reinforcement and cotton fleece lining
Cotton drill fabric back
Rubberised cuff

CE EN 388 - 4344X 7-11 120

C834 JNS

Palm reinforced split Canadian gloves
Cotton fleece lining
Blue jeans fabric back
Rubberised cuff

CE EN 388 - 4344X 7-11 120

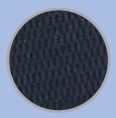
MECHANICAL GLOVES

Mach 22

Mechanical gloves with reinforced palm and breathable fabric
Artificial leather palm made of PU/PA microsuede PU material
Anti-slip coating on palm and finger tip for better grip
Shock absorbent anti-vibration latex foam padding
Additional knuckle protection and finger protection

Knuckle and
Finger Protection

Honeycomb
PU/PA Palm



Breathable
Fabric on Back

MACH 23

CE
EN 388 - 2121XP 8-10

60

TM284

Natural grain leather mechanical gloves
Black synthetic fabric back
Velcro adjusted knitted cuff
Flexible impact resistant 'SIMUM' stitched on back

CE EN 388 - 2122XP 7-11 60

TM554

Yellow grain leather mechanical gloves
Black synthetic fabric back
Velcro adjusted knitted cuff
Flexible impact resistant 'SIMUM' stitched on back

CE EN 388 - 2122XP 7-11 60

M254

Natural grain mechanical gloves
Highly dexterous fine grain leather
Black spandex fabric back
Velcro closure for adjustable fit

CE EN 388 - 2121X 9-10 60

M464

Soft grain leather mechanical gloves
Palm finger tips and thumb in soft grain leather
Back made of synthetic fabric
Elasticised back for snuggly fitting

CE EN 388 - 2121X 7-11 60

M354

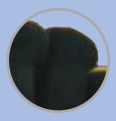
Yellow dyed soft grain leather mechanical gloves
Green Spandex fabric back
Leather knuckle protection for better working
Elasticised back with synthetic binding tape

CE EN 388 - 2121X 9-10 60

WELDER GLOVES

F697

Black split leather welder gloves
Reinforcement yellow split leather in palm
15 cm black split leather
Cotton fleece lining for the superior comfort



Black Split Leather Material

Yellow Split Leather Palm

15 cm Cuff

CE
EN 388 - 4244X
EN 407 - 423X4X
EN 12477 – TYPE A 9-11

60

F214

Full goat grain leather welder gloves
High dexterity and tear resistance
Heat resistant upto 100°C for 15 seconds
Ideal for fine welding activities

100°C
15 SECS

CE
EN 388 - 3243X
EN 407 - 413X4X
EN 12477 TYPE A 9-11
60

F224

Full cow grain leather welder gloves
Good dexterity and abrasion resistance
Heat resistant upto 100°C for 15 seconds
Excellent life for the welding activities

100°C
15 SECS

CE
EN 388 - 3243X
EN 407 - 413X4X
EN 12477 TYPE A 9-11
60

F234

Natural Combined leather welder gloves
15 cm split cuff
No lining is available
Heat resistant up to 100°C for 15 seconds

100°C
15 SECS

CE
EN 388 - 3243X
EN 407 - 413X4X
EN 12477 TYPE A 9-11
60

F294

Dyed combined leather welder gloves
15 cm black split cuff
No lining is available
Heat resistant up to 100°C for 15 seconds

100°C
15 SECS

CE
EN 388 - 3243X
EN 407 - 413X4X
EN 12477 TYPE A 9-11
60

F522DP

Palm reinforced natural split welder gloves
7 cm split leather cuff
Vein protection is available
Heat resistant up to 250°C for 15 seconds

250°c
15 SECS

CE
EN 388 - 4244X
EN 407 - 423X4X
9-11
60

F524

Natural split leather welder gloves
15 cm natural split welder gloves
Heat resistant up to 100°C for 15 seconds
Ideal for fine welding activities

100°C
15 SECS

CE
EN 388 - 2122X
EN 407 - 413X4X
EN 12477 TYPE A
9-11
60

F437

Dyed red split leather welder gloves
15 cm red split cuff
Cotton fleece lined palm and cuff lined with canvas
Heat resistant up to 100°C for 15 seconds

100°C
15 SECS

CE
EN 388 - 4133X
EN 407 - 413X4X
EN 12477 TYPE A
9-11
60

F497

Dyed black split leather welder gloves
Yellow split thumb back
15 cm black black split cuff
Cotton fleece lined palm and cuff lined with canvas
Heat resistant up to 100°C for 15 seconds

100°C
15 SECS

CE
EN 388 - 4133X
EN 407 - 413X4X
EN 12477 TYPE A
9-11
60

F667

Dyed blue split welder gloves with yellow split palm reinforcement
15 cm split cuff with vein protector
Cotton fleece lined palm and cuff lined with canvas
Heat resistant up to 100°C for 15 seconds

CE
EN 388 - 4133X
EN 407- 413X4X
EN 12477 TYPE A 9-11
60

F834

Dyed mustard split welder gloves
Multi layered palm for enhance protection
Synthetic non woven lined Palm
Heat resistant up to 350°C for 15 seconds

CE
EN 388 - 4244X
EN 407 - 433X4X
EN 12477 TYPE A 9-11
60

H044K

Yellow dyed split welded gloves
15 cm split leather cuff
Seamless para-aramid lined palm
Para-aramid stiched gloves
Heat resistant up to 100°C for 15 seconds

CE
EN 388 - 2122X
EN 407 - 423X4X
EN 12477 TYPE A 9-11
60

H224K

Natural grain leather welder gloves
natural Split leather cuff with vein protection
Hi-vis tape stitched on cuff
100% para-aramid lining
Heat resistant up to 250°C for 15 seconds

CE
EN 388 - 2122X
EN 407 - 423X4X
EN 12477 TYPE A 9-11
60

H294K

Dyed yellow grain leather welder gloves
Black split leather cuff with vein protection
Hi-vis tape stitched on cuff
100% para-aramid lining
Heat resistant up to 250°C for 15 seconds

CE
EN 388 - 2122X
EN 407 - 423X4X
EN 12477 TYPE A
9-11
60

H468

Water repellant full grain welder gloves
Excellent thermally insulated gloves
Multilayered gloves with aluminium sheet
20 cm split cuff with velcro adjustment
Heat resistant up to 500°C for 15 seconds

CE
EN 388 - 4133X
EN 407 - 443X4X
EN 12477 TYPE A
9-11
60

H544K

Dyed red split welder gloves
Wool lining inside
15 cm natural split cuff
Heat resistant up to 100°C for 15 seconds

CE
EN 388 - 4244X
EN 407 - 42314X
EN 511- 11X
EN 12477 TYPE A
9-11
60

HAMK

Dyed orange split welder gloves
Back is reinforced with aluminized preox fabric
100% non woven lining inside
Heat resistant up to 100°C for 15 seconds

CE
EN 388 - 4133X
EN 407 - 413X4X
EN 12477 TYPE A
9-11
60

KD4377A

600 gsm woven para-aramid gloves
15 cm natural split leather cuff
Cotton palm lining inside
Upto 250°C contact heat resistant for 15 seconds

250°c
15 SECS

CE
EN 388 - 2441C
EN 407 - 423X3X
EN 12477 TYPE A 9-11
60

KW4377A

600 gsm woven heat resistant para-aramid gloves
Cotton lining available inside
Upto 250°C contact heat resistant for 15 seconds

250°c
15 SECS

CE
EN 388 - 2441C
EN 407 - 423X3X
EN 12477 TYPE A 9-11
60

KWL15

Para-aramid palm leather welder gloves
Knit acrylic fabric lined and para-aramid sewn
15 cm heat resistant split cuff
Upto 250°C contact heat resistant for 15 seconds

250°c
15 SECS

CE
EN 388 - 2441C
EN 407 - 423X3X
EN 12477 TYPE A 9-11
60

KWS15

Mitten style fully insulated welder gloves
Para-aramid lined for high temperature resistance
15 cm soft split leather cuff
Upto 250°C contact heat resistant for 15 seconds

250°c
15 SECS

CE
EN 388 - 2441C
EN 407 - 423X3X
EN 12477 TYPE A 9-11
60

WELDING GARMENT & ACCESSORIES

SLJB01

100% natural grain/split leather welder jacket
Sewn with para-aramid thread
Velcro fastening on front placket
Heat-resistant up to 180°C

Velcro Fastening
Front Placket

Natural Split
Leather

Button
Fastening

SLTE01

CE
EN 11611 Class 2 A1 M - XL

20

SLHE01

100% natural grain/split leather welding hood
Sewn with para-aramid thread
Front velcro closure
Heat-resistant up to 180°C

CE EN 11611 Class 2 A1 M - XL 20

SLGE01

100% natural grain/split leather welding leg guard
Sewn with para-aramid thread
Velcro closure
Heat-resistant up to 180°C

CE EN 11611 Class 2 A1 20

SLAS01

Natural split leather apron
Leather belts and string for comfortable wear
Sewn with polyester thread
Ideal for welding operations

CE EN 11611 Class 2 A1 20

LARMSLV

Dyed yellow split leather armsleeve
Elasticised wrist
Velcro fastener tape
Para-aramid stiching thread

CE EN 388 - 2122X 20

PARA ARAMID GLOVES

KCL

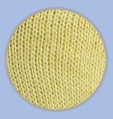
Heat resistant para-aramid knitted gloves

7 gauge seamless knitting

Heat resistant up to 250°C for 15 seconds

100% cotton platted liner

Cotton Liner



Yellow Body Material

Black Border

CE

EN 388 - 234XX

EN 407 - 423XXX 9 -11

K007/K010

High performance para-aramid knitted gloves
7 gauge seamless knitting
Elasticised knitted wrist
Option of 10G seamless knit available

CE
EN 388 - 134XX 8 - 11
60

K007D/K010D

High performance para-aramid knitted gloves
10 gauge seamless knitting
PVC dots are available on palm side
Elasticised knitted wrist

CE
EN 388 - 134XX 9 - 11
60

KP07

High performance para-aramid knitted gloves
Terry towel finish for enhanced heat resistance
7 gauge seamless knitted
Heat resistant up to 100°C for 15 seconds.

CE
EN 388 - 134XX 9 - 11
60

KL010

Palm reinforced para-aramid gloves
10 guage seamless knitted
Natural split leather palm reinforcement
Provides good puncture resistant

CE
EN 388 - 3342X 9 - 11
60

KCL15

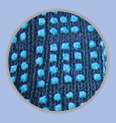
Seamless para-aramid knitted welder gloves
7 gauge seamless liner
Cotton lining is inside
15 gauge dyed red split cuff

CE
EN 388 - 234XX
EN 407 - 423XXX 9 - 11
60

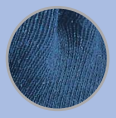
KNITTED GLOVES

C1045D

Cotton knitted 10 gauge seamless gloves
Block patterned PVC dotting on palm side
Elasticised rib for snuggly fitting
Sky blue dotting over navy blue colored lining

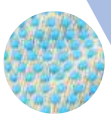


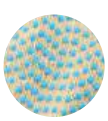
Block Patterned PVC Dotting

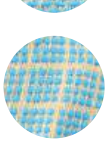


Cotton Knitted Seamless Gloves

Elasticised Rib for Snug Fitting







CE
EN 388 - 211XX 9 - 11

600

C1025D

Cotton knitted 10 gauge seamless gloves
Block patterned PVC dotting on palm side
Elasticised rib for snuggly fitting
Sky blue dotting over off-white colored lining

CE EN 388 - 211XX 9 - 11 600

C0705D

Cotton knitted 7 gauge seamless gloves
PVC dotted palm to enhance grip & abrasion resistance
Elasticised rib for snuggly fitting
Sky blue dotting over off-white colored lining

CE EN 388 - 211XX 9 - 11 600

C1032D

Cotton knitted 10 gauge durable seamless gloves
PVC dotted palm to enhance grip & abrasion resistance
Elasticised rib for snuggly fitting
Sky blue dotting over off-white colored lining

CE EN 388 - 211XX 9 - 11 600

FL010

High cut resistant seamless gloves with split leather palm reinforcement
HPPE blended lining
High performance gloves
Elasticised rib for snuggly fitting

CE EN 388 - 3342X 9 - 11 600

HL010

High cut resistant seamless gloves with split leather palm reinforcement
HPPE & fibreglass blended lining
High performance gloves
Elasticised rib for snuggly fitting

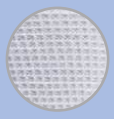
CE EN 388 - 3542X 9 - 11 600

KNITTED GLOVES

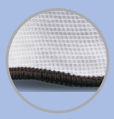
P151A

Polyester knitted 15 gauge seamless gloves
White lint free gloves for electronics industry
Anti-static finger tips
High dexterity for precision job
Also available in 13 gauge

Carbon fibre fingertips



Knitted polyester material



Black lining

P1308D

Polyester knitted 13 gauge seamless gloves
PVC dotting on palm side
Two side PVC dotting is also available
High tear resistance
Good abrasion resistance

CE EN 388 - 214XX 7 - 11 300

NC1002D

Nylon knitted 10 gauge seamless gloves
Cotton plating inside
PVC dotting on palm side
High performnce gloves

CE EN 388 - 214XX 7 - 11 300

P153S

Seamless knitted anti slip gloves
13 gauge polyester knitted liner
Ribbed knitting construction
Providess excellent anti slip properties

7 - 11 300

H33G5

High cut resistant seamless knitted gloves
HPPE and fibreglass blended liner
Elasticised knitted rib

CE EN 388 - 254XX 7 - 11 120

N1302D

Nylon knitted 13 gauge seamless gloves
PVC dotting on palm side
High dexterity for fine working
Good abrasion resistance

CE EN 388 - 214XX 7 - 11 300

ARM SLEEVES GLOVES

KARMSLV

100% para-aramid yarn knitted 13 gauge arm sleeve
Thumb hole is available for user convenience
36 cm long sleeve
Exceptional cut resistant performances

250°c
15 SECS

Para-aramid fibre

Thumb hole

Snug fitting

CE
EN 388 - 2334C
EN 407 - X2XXXX

300

ARMOREX

13 gauge knitted high cut resistant arm sleeve
Liner is made of blended HPPE and fibreglass blended yarn
Velcro adjusted upper arm fastening with knitted wrist

CE
EN 388 - 254XC
300

CARMSLV

100% cotton knitted arm sleeve
10 gauge knitted liner
Thumb hole is available for user convenience

CE
EN 388 - 1X1XX
300

GARMSLV

Seamless glass fibre blended high cut resistant arm sleeve
13 gauge knitted seamless liner
Elasticised rib for snuggly fitting

CE
EN 388 - 254XC
300

PARMSLV

100% Polyester knitted arm sleeve
13 gauge knit with open elbow
Knitted rib for snuggly fitting
Thumd hole is available for users convenience

CE
EN 388 - 1X2XX
300

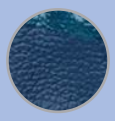
NITRILE CUT-n-STITCH GLOVES

DFRB

High performance cut and sewn nitrile gloves
Cut-resistant fibreglass blended para-aramid liner
Cotton interlock shell for flexibility
Rexin cuff is available


Blue Nitrile Coating


Blue Liner


Para-aramid Fabric

CE
EN 388 - 4532D
EN 407- X1XXXX 7-11

120

TPCB

Heavy coated cut and stitch nitrile gloves
Palm dipping ensures flexibility
100% cotton fleece lining
Safety cuff is available

CE EN 388 - 4221B 7-11 120

TPKB

Heavy coated cut and stitch nitrile gloves
Palm dipping ensures flexibility
100% cotton fleece lining
Knitted wrist is available

CE EN 388 - 4221B 7-11 120

TFCB

Heavy coated cut and stitch nitrile gloves
Full dipped gloves for enhanced protection
100% cotton fleece lining
Safety cuff is available

CE EN 388 - 4221B 7-11 120

TFKB

Heavy coated cut and stitch nitrile gloves
Full dipped gloves for enhanced protection
100% cotton fleece lining
Knitted wrist is available

CE EN 388 - 4221B 7-11 120

MPCB

Medium coated cut and stitch nitrile gloves
Palm dipping ensures flexibility
100% cotton interlock lining
Canvas cuff is available

CE EN 388 - 4121X 7-11 120

MPKB

Medium coated cut and stitch nitrile gloves
Palm dipping ensures flexibility
100% cotton interlock lining
Knitted wrist is available

CE EN 388 - 4121X 7-11 120

MFCB

Medium coated cut and stitch nitrile gloves
Full dipped gloves for enhanced protection
100% cotton interlock lining
Safety cuff is available

CE EN 388 - 4121X 7-11 120

MFKB

Medium coated cut and stitch nitrile gloves
Full dipped gloves for enhanced protection
100% cotton interlocklining
Knitted wrist is available

CE EN 388 - 4121X 7-11 120

MHCB

Sustainable nitrile gloves
Medium dipped full coating on cut and stitch liner
100% cotton interlock lining
Safety cuff is available

CE EN 388 - 4121X 7-11 120

MHKB

Sustainable nitrile gloves
Medium dipped full coating on cut and stitch liner
100% cotton interlock lining
Knitted wrist is available

CE EN 388 - 4121X 7-11 120

MJCB

Sustainable nitrile gloves
Medium dipped full coating on cut and stitch liner
100% cotton interlock lining
Safety cuff is available

CE EN 388 - 4121X 7-11 120

MJKB

Sustainable nitrile gloves
Medium dipped full coating on cut and stitch liner
100% cotton interlock lining
Knitted wrist is available

CE EN 388 - 4121X 7-11 120

LPKY

Lite dipped cut and stitch nitrile gloves
Palm dipping ensures flexibility
100% cotton interlock lining
Knitted wrist is available

CE EN 388 - 4111X 7-11 120

LFKY

Lite dipped cut and stitch nitrile gloves
Full dipped gloves for enhanced protection
100% cotton interlock lining
Knitted wrist is available

CE EN 388 - 4121X 7-11 120

LPKB

Lite dipped cut and stitch nitrile gloves
Palm dipping ensures flexibility
100% cotton interlock lining
Knitted wrist is available

CE EN 388 - 4111X 7-11 120

NBR GAUNTLET GLOVES

DFJB

High cut-resistant nitrile 40 cm gauntlet
Cotton interlock outer shell
Cut resistant glass and para-aramid inner shell
Blue coloured full dip NBR coating

Blue NBR
Full Coating

Cotton Interlock
Shell Lining

Gauntlet
Style Gloves

CE
EN 388 - 4542D
EN 374-1
EN 407 - X2XXXX 9-11

120

NIF TECHO FL 40

Standard 40 cm nitrile gauntlet
Soft and comfortable cotton fleece
Durable blue NBR coating
Good for chemical resistance

CE
EN 388 - 4221X, EN 374-1
EN 374-2 7 - 11
120

NIF LITE IL 30

30 cm gauntlet style nitrile gloves
Blue coloured lite NBR full coating
300 gsm cotton interlock lining
Good for chemical resistance

CE
EN 388 - 4221X, EN 374-1
EN 374-2, EN 374-4 7 - 11
120

NIF LITE IL 40

40 cm gauntlet style nitrile gloves
Blue coloured lite NBR full coating
300 gsm cotton interlock lining
Ideal for chemical handling

CE
EN 388 - 4221X, EN 374-1
EN 374-2, EN 374-4 7 - 11
120

NIF TECHO FL 30

30 cm gauntlet style nitrile gloves
Blue coloured heavy NBR full coating
300 gsm cotton fleece lining
Ideal for chemical handling

CE
EN 388 - 4221X, EN 374-1
EN 374-2, EN 374-4 7 - 11
120

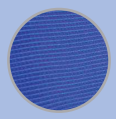
NBR SEAMLESS GLOVES

NS5FHT

Dual coated seamless nitrile gloves
15 gauge blue coloured nylon liner
Yellow coloured crotch reinforecment for better life
Black sandy palm coating over full smooth blue coating
Good chemcial resistant and extra life

Black Sandy Palm

Yellow Crotch Reinforcement



Nylon Knitted Blue Liner

CE
EN 388 - 4131X 7 - 11

300

PS5NPT

Dual coated seamless nitrile gloves
15 gauge blue coloured polyester liner
Black sandy palm coating over full smooth green coating
Economical and chemical resistant gloves

CE EN 388 - 4131X 7 - 11 300

P35RHK

Crotch reinforced Dual coated seamless nitrile gloves
15 gauge grey polyester liner
Black sandy finish over 3/4th blue smooth coating
Sturdy gloves ideal for chemical handling

CE EN 388 - 4131X 7 - 11 300

P35NHK

Dual coated seamless nitrile gloves
15 gauge grey polyester liner
Black sandy finish over 3/4th blue smooth coating
Sturdy gloves ideal for chemical handling

CE EN 388 - 4131X 7 - 11 300

K63NBG

Seamless 13 gauge para-aramid knitted nitrile gloves
Heat and mechanical resistant gloves
Coated with black NBR sandy finish
Tear resistant durable gloves

CE EN 388 - 4131X 7 - 11 300

P55NBC

Black polyester knitted seamless nitrile gloves
15 gauge knitted liner
Full coated with black NBR
Smooth finish

CE EN 388 - 4121X 7 - 11 300

P35NBC

Grey polyester knitted seamless nitrile gloves
15 gauge knitted liner
Full coated with black NBR
Smooth finish

CE EN 388 - 4121X 7 - 11 300

PJ4NBC

13 gauge seamless anti-slip gloves with NBR coating
100% polyester lining
Full coated black NBR
Smooth finish

CE EN 388 - 4121X 7 - 11 300

P94NBB

13 gauge seamless anti-slip gloves with NBR coating
100% red polyester lining
3/4th coated black NBR
Smooth finish

CE EN 388 - 4121X 7 - 11 300

N33VBA

13 gauge seamless knitted NBR gloves
PVS dotted on palm side
100% nylon liner
Smooth NBR palm coating

CE EN 388 - 4121X 7 - 11 300

M35NBV

15 gauge seamless NBR glove
Enhanced with Foamyflex® coating technology
Nylon spandex blended liner
Highly dexterous gloves

CE EN 388 - 4121X 7 - 11 300

P65NAG

15 gauge seamless knitted hi-vis gloves
Blue NBR palm coating
100% polyester knitted liner
Sandy finish

CE EN 388 - 4121X 7 - 11 300

P85NAG

15 gauge seamless knitted hi-vis orange gloves
Blue NBR palm coating
100% polyester knitted liner
Sandy finish

CE EN 388 - 4121X 7 - 11 300

P35NBA

15 gauge seamless knitted NBR gloves
100% polyester liner
Palm dipped smooth NBR coating
High durable economy gloves

CE EN 388 - 4121X 7 - 11 300

P35NBG

15 gauge seamless knitted NBR gloves
100% polyester liner
Palm dipped sandy NBR coating
High durable economy gloves

CE EN 388 - 4121X 7 - 11 300

P25NGA

15 gauge seamless knitted NBR gloves
100% polyester white liner
Palm dipped smooth NBR coating
High durable economy gloves

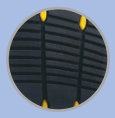
CE EN 388 - 4121X 7 - 11 300

CUT RESISTANT NBR GLOVES

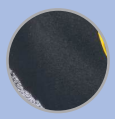
H33EDL

Crotch reinforced seamless NBR gloves
HPPE and fibreglass blended 13 gauge cut resistant liner
Impact resistant padding is pasted on back
Palm coated sandy finish

Crotch Reinforcement



Impact-resistant Padding



Palm with Sandy Finish

CE
EN 388 - 4542CP 7 - 11

120

H33DBG

Crotch reinforced cut resistant seamless NBR gloves
HPPE and fibreglass blended 13 gauge liner
Palm coated sandy finish
Elasticised knitted wrist

CE EN 388 - 4542CP 7 - 11 120

G63TDL

Metacarpal protected cut resistant seamless nitrile gloves
13 gauge hi-vis liner blended with HPPE and glass fibre
Impact resistant padding is pasted on back
Palm coated sandy finish

CE EN 388 - 4542CP 7 - 11 120

LR3TDL

Metacarpal protected cut resistant seamless nitrile gloves
Yellow liner blended with HPPE and glass fibre
Impact resistant padding is pasted on back
Palm coated sandy finish

CE EN 388 - 4542CP 7 - 11 120

L83TDL

Metacarpal protected cut resistant seamless nitrile gloves
Orange liner made of HPPE glass blended fibre
Impact resistant padding is pasted on back
Palm coated sandy finish

CE EN 388 - 4542CP 7 - 11 120

CUT RESISTANT NBR GLOVES

D45NBG

High cut resistant NBR coated Dyneema® gloves
15 gauge seamless knitting
Liner blended with Dyneema® and fibreglass
Palm coated sandy finish

Palm with Sandy Finish

Grey Seamless Liner

Black NBR Coated

CE
EN 388 - 4X42D 7 - 11

120

D33NBG

High cut resistant NBR coated Dyneema® gloves
13 gauge seamless knitting
Liner blended with Dyneema® and fibreglass
Palm coated sandy finish

CE
EN 388 - 4X42D 7 - 11
120

WT5NBG

Hi performance 15 gauge seamless nitrile gloves
Filament steel, fibreglass and HPPE blended liner
7 gauge acrylic fleece lining for thermal insulation
Palm coated sandy finishing

CE
EN 388 - 4542D
EN 407 - X3XXXX
EN 511 - X2X 7 - 11
120

H33NBG

High cut resistant seamless nitrile gloves
Knitted in 13 gauge
HPPE and fibreglass blended liner
Palm coated sandy finish

CE
EN 388 - 4542D 7 - 11
120

E33NBG

High cut resistant seamless nitrile gloves
Knitted in 13 gauge
HPPE and filament steel blended liner
Palm coated sandy finish

CE
EN 388 - 4542C 7 - 11
120

Z38NBG

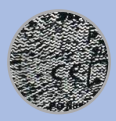
High cut-resistant seamless nitrile gloves
Knitted in 18 gauge
HPPE and nickel filament blended liner
Palm coated sandy finish

CE
EN 388 - 4542D 7 - 11
120

PU GLOVES

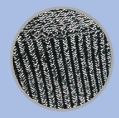
P363G

Black melange colour 13 gauge cut resistant PU glove
HPPE yarn blended with polyster and glass fibre
Grey PU coating on palm
High abrasion resistance for anti-blade operation



Black Mélange
Liner

Grey PU
Coating



Polyurethane
Coating

CE
EN 388 - 4542C 7 - 11

144

P213W

White polyester 13 gauge PU coated glove
White PU coating on the palm
Standard economical glove for general application

CE EN 388 - 4131X 7 - 11 144

P313G

Grey polyester 13 gauge PU coated glove
Grey PU coating on the palm
Ideal for general applications

CE EN 388 - 4131X 7 - 11 144

P513B

Black polyester 13 gauge PU coated glove
Black PU coating on the palm
Standard economical glove for general application

CE EN 388 - 4131X 7 - 11 144

P213AS

White PU coated anti-static gloves
Carbon fibre blended seamless liner
13 gauge knitting
Suitable for electronics

CE EN 388 - 4131X 7 - 11 144

P318G

Blue polyester knitted 18 gauge PU coated glove
Black PU coating on the palm
Highly dexterous gloves
Compatible for various applications

CE EN 388 - 4131X 7 - 11 144

L210B

Latex coated seamless gloves
10 gauge knitted liner
Palm coated wrinkle latex finishing
Polyester cotton lining

9 - 11 144

L152O

Light weight unchlorinated natural latex gloves
Perfect for the food handling
Ideal for handling bio waste
Patterned grip for enhanced dexterity
Also available in grey colour

9 - 11 144

L152G

L152P

Light weight unchlorinated natural latex gloves
Perfect for the food handling
Ideal for handling bio waste
Patterned grip for enhanced dexterity
Also available in yellow colour

9 - 11 144

L152Y

VP49TL

High durable gauntlet style PVC gloves
Polyester knitted lining inside
27 cm in length
Chemical resistant gloves

CE EN 388 - 4121X 9 - 11 144

VS38TL

High durable gauntlet style PVC gloves
Polyester knitted lining inside
27 cm in length
Chemical resistant gloves
Sandy coated over smooth finishing

CE EN 388 - 4121X 9 - 11 144

mallcom®

VP29TR

High durable gauntlet style PVC gloves
Polyester knitted lining inside
27 cm in length
Chemical resistant gloves
Rough surface coating

CE
EN 388 - 4121X 9 - 11
144

NE282B

Gauntlet style unsupported neoprene gloves
Ideal for handling a variety of chemicals
Raised diamond pattern grip
Thickness 28 mil

CE
EN 388 - 3121X
EN 374-1 EN 374 - 5 8 - 10
144

NEB213BY

Gauntlet style unsupported neoprene-latex gloves
Raised diamond pattern grip
Thickness 21 mil
Providess good chemical resistant at economical cost

CE
EN 388 - 3121X
EN 374-1 EN 374 - 5 9 - 11
144

NF153G

High dexterous flock lined gauntlet style nitrile gloves
Raised diamond pattern grip
Thickness 15 mil
Ideal for handling variety of chemicals

CE
EN 388 - 4102X
EN 374-1 EN 374 - 5 8 - 10
144

NU113G

High dexterous Unlined gauntlet nitrile gloves
Raised diamond pattern grip
Thickness 11 mil
Ideal for handling variety of chemicals

CE
EN 388 - 2001X
EN 374-1 EN 374 - 5 9 - 11
144

CRYO ARTICLES

CRAI

Waterproof multi-layered cryogenic apron
Laminated blue nylon woven fabric
Adjustable straps with buckle fastener at the neck and waist
Extreme cold applications down to -196°C
Size 24"x42"

Cryogenic Apron

Adjustable Straps

Laminated Blue Nylon Woven Fabric

CE
EN 388 - 1233X
EN 511 - 11X

CRWR

Multi-layered full palm cryogenic gloves
Laminated blue nylon woven fabric
Knitted wrist for snuggly fitting
Extreme cold applications down to -196°C
Waterproof version is also available

CE
EN 388 - 1233X
EN 511 - 11X 8 - 11

CGMI

Waterproof multi-layered mid arm cryogenic gloves
Laminated blue nylon woven fabric
Available length is 33 - 38 cm
Extreme cold applications down to -196°C

CE
EN 388 - 1233X
EN 511 - 11X 9 - 11

CREB

Multi-layered elbow length cryogenic gloves
Laminated blue nylon woven fabric
Available length is 43 - 50 cm
Extreme cold applications down to -196°C
Waterproof version is also available

CE
EN 388 - 1233X
EN 511 - 11X 9 - 11

CGSI

Waterproof multi-layered shoulder length cryogenic gloves
Laminated blue nylon woven fabric
Available length is 60 - 68 cm
Extreme cold applications down to -196°C

CE
EN 388 - 1233X
EN 511 - 11X 9 - 11

Body Protection

We excel in providing top-quality body protection PPE through Mallcom's workwear. Crafted for comprehensive protection in industrial settings, these garments offer durability and comfort during extended wear. Their dirt and dust-proof properties make them a dependable barrier against workplace perils. Get these unparalleled body protection PPE items now.

mallcom®

ECONOMY WORKWEAR

FLORIAD

Composition: 65% Cotton 35% Polyester, 240 gsm
Coverall with zip closure
Left chest pocket with gusset and flap
Closed by buttons and 1 sleeve pocket on the left side


Mobile Pocket


Zip Closure


Elasticized Waist Tightening


Orange (Bi colour Grey)


Navy Blue (Bi colour Royal Blue)

CE
EN 13688 S - XL

20

KOLDING

Composition: 65% Cotton 35% Polyester, 240 gsm
Jacket with zip closure and button closure at bottom
Shirt collar jacket and 2 chest pockets with button closure
Sleeve tightening with buttons


Royal Blue


Navy Blue


Orange

CE EN 13688 S - XL 20

NORD

Composition: 65% Cotton 35% Polyester, 240 gsm
Trouser with zip and button closure
Inside elasticised back and sliding tab 5 belt loops
Front has 1 pleats on each sides and 2 pockets


Royal Blue


Navy Blue


Orange

CE EN 13688 S - XL 20

KASSEL

Composition: 65% Cotton 35% Polyester, 240 gsm
Short coat with snap button closure and short sleeve
2 reinforced button pockets
1 chest pocket

CE EN 13688 S - XL 20

RHINE

Composition: 65% Cotton 35% Polyester, 240 gsm
Trouser with no pleat and patch pocket zipper with button closure
Elasticised wasitband along with the provision of a belt
1 side pocket on each side

CE EN 13688 S - XL 20

DRESDEN

Composition: 65% Cotton 35% Polyester, 240 gsm
Long coat with snap button closure
2 reinforced bottom pockets
1 chest pocket with pen holder

CE EN 13688 S - XL 20

LUBECK

Composition: 100% cotton, 210 gsm
Trouser with front zipper closure and 1 side pocket on each side
2 pleats and welt pockets and 1 side pocket
Elasticised waistband along with the provision of a belt

EN 13688 S - XL 20

BREMEN

Composition: 100% cotton, 210 gsm
Long coat with snap button closure
Comfortable design with short sleeve
No pockets are available

EN 13688 S - XL 20

TRIER

Composition: 100% cotton, 210 gsm
Short coat with snap button closure and long sleeves
2 reinforced button pockets
1 chest pocket with a pen holder

EN 13688 S - XL 20

PREMIUM WORKWEAR

GOTLAND

Composition: 100% cotton, 210 gsm
Bi-coloured coverall with front zipper and snap button closure
Elasticised back waist tightening
6 strategically placed pockets for convenience

Pocket for Convenience

Front Zipper

Snap Button Closure

Orange/Grey

Royal Blue/Navy

CE
EN 13688 S - XL

20

ESBERG

Composition: 100% cotton, 210 gsm
Bi-coloured jacket with elasticised waist tightening on sides
Preformed elbows for enhanced mobility
5 pockets for convenient storage of tools and essentials

Orange/Grey

Royal Blue/Navy

CE EN 13688 S - XL 20

BERGEN

Composition: 100% cotton, 210 gsm
Bi-coloured trouser front zipper closure
Elasticised waist tightening on sides
4 functional pockets

Orange/Grey

Royal Blue/Navy

CE EN 13688 S - XL 20

FLAME RETARDANT WORKWEAR

PARIS

Composition
Option 1: 100% Cotton FR Treated 220 gsm
Option 2: 50% Modacrylic, 38% Cotton, 10% m-Aramide
2% Antistatic, 180 gsm
Bi-coloured design for enhanced visibility and aesthetic appeal
Cargo patch pocket with flap and hidden ruler pocket
Velcro closure on arm sleeves


Two-way Zipper


FR Reflective Tape


Velcro Closure

NFPA 2112

CE
EN 11611
EN 11612
EN 61482
EN 13688

S - XXL

20

RIGA

Composition:
Option 1: 100% Cotton FR Treated 220 gsm
Option 2: 50% Modacrylic, 38% Cotton, 10% m-Aramide
2% Antistatic, 180 gsm
Shirt with concealed snap button closure at front
2 front pockets with flap covers with snap button
Cuff adjustment with concealed snap button closure

Navy Blue

NFPA 2112 EN 11611 EN 11612 EN 13688 S - XXL 20

BUCHAREST

Composition:
Option 1: 100% Cotton FR Treated 220 gsm
Option 2: 50% Modacrylic, 38% Cotton, 10% m-Aramide
2% Antistatic, 180 gsm
Trouser with elasticised waist and zipper
Concealed button closure and 1 back pocket
1 thigh pocket on left side and 1 ruler pocket on right side

Navy Blue

NFPA 2112 EN 11611 EN 11612 EN 13688 S - XXL 20

FLAME RETARDANT WORKWEAR

BELARUS

Composition
Option 1: 100% Cotton FR Treated 220 gsm
Option 2: 50% Modacrylic, 38% Cotton, 10% m-Aramide
2% Antistatic, 180 GSM
FR coverall with 2-way zip closure


Zip Closure


Pocket
with Zipper


Retroreflective
Tape


Bristol


Grey


Navy Blue

NFPA
NFPA 2112

CE
EN 11611
EN 11612
EN 61482
EN 13688

S - XXL

20

BRUGES

Composition
Option 1: 100% Cotton FR Treated 220 gsm
Option 2: 50% Modacrylic, 38% Cotton, 10% m-Aramide
2% Antistatic, 180 gsm
Shirt with concealed snap button closure on front
2 front pockets with flap covers and concealed metal snap button closures

Grey

EN 11611
EN 11612
EN 61482
EN 13688

NFPA 2112

S - XXL

20

LEUVEN

Composition
Option 1: 100% Cotton FR Treated 220 gsm
Option 2: 50% Modacrylic, 38% Cotton, 10% m-Aramide
2% Antistatic, 180 gsm
Trouser with elasticised waist and zipper
Concealed button closure and 1 back pocket

Grey

EN 11611
EN 11612
EN 61482
EN 13688

NFPA 2112

S - XXL

20

STRATUS

100% polyester PU coated in 120 gsm
Pant & jacket set with silver reflective piping and waterproof seam sealing
Front closure by zipper secured with flap and velcro
Detachable hood with drawstring adjuster
Elasticised pull-on pant with velcro-adjustable leg bottom

Grey

CE
EN 343
EN 13688 S - XXL
20

NIMBUS

100% polyester PU coated in 120 gsm
Pant & jacket set with waterproof seam sealing
Non detachable hood with drawstring adjuster
Elasticised pull-on pant
Velcro-adjustable sleeve cuff and leg bottom

Navy Blue

CE
EN 343
EN 13688 S - XXL
20

CUMULUS

100% polyester PU coated in 120 gsm Poncho
Snap button closure on sides and permanent hood with drawstring cord
Extra space for backpack cover and velcro closure with flap for storage
Hi-vis logo on front and back


Navy Blue


Olive

CE
EN 343
EN 13688

20

ARCUS

100% polyester PU coated in 120 gsm
Bi-coloured jacket with front closure zipper and velcro
Elasticised sleeve cuff and detachable hood with drawstring cord
Pant with elasticised waist and cuff with 1 patch pocket


Navy/Grey


Grey/Black

CE
EN 343
EN 13688 S - XXL

20

HI-VIS

PROCLO K383

Composition: 115 gsm warp knitted 100% polyester fabric
Hi-vis vest with zip closure
Front chest pocket with velcro opening flap
2 pockets with flap at bottom


Reflective Tape


Zip Closure


Transparent Pocket

CE
EN 20471
EN 13688 XS – XXL

20

PROCLO K382

Composition: 115 gsm warp knitted
100% polyester fabric
Hi-vis vest with velcro closure
Hanger loop attached to the main fabric

CE
EN 20471
EN 13688 XS – XXL
20

PROCLO K592

Composition: 120 gsm warp knitted heavy mesh
100% Polyester fabric
Hi-vis vest with velcro closure and black piping
Hanger loop attached to the main fabric

CE
EN 20471
EN 13688 XS – XXL
20

PROCLO L382

Composition: 115 gsm warp 100% Polyester fabric
Hi-vis vest with velcro closure
2 vertical & 1 horizontal retroreflective tape of 2" width
Hanger loop attached to the main fabric

CE
EN 20471
EN 13688 XS – XXL
20

HI-VIS

PROCLO M382

Composition: 115 gsm warp-knitted 100% polyester
Vest with 2" retroreflective tape
Hi-vis vest with velcro closure
2 vertical and 1 horizontal retro reflective tape of 2" width

Retroreflective Tape

Front-end Closure

Velcro Closure

CE
EN 20471
EN 13688

XS – XXL

PROCLO M383

Composition: 115 gsm warp knitted 100% polyester fabric
Hi-vis vest with zipper closure and black piping
Front chest pocket with velcro opening flap on chest right side
Hanger loop attached to the main fabric

CE
EN 20471
EN 13688 XS – XXL
20

PROCLO N382

Composition: 115 gsm warp 100% Polyester fabric
Hi-vis vest with velcro closure
2 vertical and 1 horizontal retroreflective tape of 2" width
Hanger loop attached to the main fabric

CE
EN 20471
EN 13688 XS – XXL
20

PROCLO M592

Composition: 120 gsm warp knitted heavy mesh
100% Polyester fabric
Hi-vis vest with velcro closure and black piping
2 vertical and 2 horizontal retroreflective tape of 2" width
Hanger loop attached to the main fabric

CE
EN 20471
EN 13688 XS – XXL
20

DISPOSABLE

JD7AY

Composition: 70 gsm SSMMS fabric
Disposable coverall with zip closure
Barrier against certain limited liquid chemical splash
Lightweight breathable water-resistant material


Zip Closure


Elastic Cuff


Elastic Ankle


JB8AY

CE
EN 13688
EN 14605 (Type 4)
EN 13982-1 (Type 5)
EN 13034 (Type 6)

20

KC2GZ

Composition: 40 gsm laminated non woven polypropylene fabric
Lightweight disposable shoe cover with 8 mm elastic closure
For healthcare industry usage

CE EN 13688 20

LA2EZ

Composition: 40 gsm non-woven polypropylene fabric
Disposable apron with strap fastener
Lightweight disposable full sleeve apron for healthcare applications
Protects from bio-hazard risks and harmful particles

CE EN 13688 20

KC2HZ

Composition: 40 gsm non woven polypropylene fabric
Disposable bouffant cap with elasticated fastener
Lightweight disposable bouffant cap for health care applications
Protects from bio-hazard risks

CE EN 13688 20

MP29G

Composition: PU coated polyster fabric, 90 gsm
Reuseable gown with strap fastener
Protects from bio-hazardous risks e.g. liquid and particles

CE EN 13688 20

LB6JZ

Composition: 65 gsm polypropylene fabric
Lightweight disposable full sleeve apron with strap fastener
Protects from bio-hazardous risks and harmful particles

CE EN 13688 20

MEDIGUARD 11

Composition: Poly-Viscose-Spandex 160 gsm fabric in 4 unique colours
Unisex design, comfortable, stretchable and antimicrobial finish
V neck top with 1 chest pocket
Trouser with elasticated waistband and drawstring


Hospital Blue


Royal Blue


Grey

CE EN 13688 S-XXL 20

MEDIGUARD 12

Composition:Poly-Viscose-Spandex 160 gsm fabric
Unisex design, comfortable, stretchable and antimicrobial finish
Mandarin neck top with 2 botton pockets
Trouser with elasticated waistband and drawstring


Hospital Blue


Magenta


Royal Blue

CE EN 13688 S-XXL 20

Feet Protection

We excel in producing safety shoes that provide unparalleled protection in heavy-duty industrial environments. Our range features anti-slip and waterproof designs, ensuring stable footing and safeguarding against wet conditions. Lightweight yet impact-resistant, these shoes offer comfort without compromising safety. Designed for breathability, they keep feet cool and dry during long hours. Perfect for construction, manufacturing, and hazardous workplaces, our shoes are engineered to meet the toughest demands, providing comprehensive protection where it matters most.

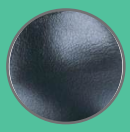
mallcom®

EXECUTIVE FOOTWEAR

IBERIAN

Low ankle shoe with black corrected grain leather upper
Grey synthetic mesh lining
Removable EVA laminated woven polyester insocks

Synthetic Mesh Lining



Grain Leather Upper

Dual Density PU Sole

OLIVER®

Impact resistant | Energy absorbent | Anti-static | Puncture resistant | Oil resistant | Slip resistant | Hydrocarbon resistant

EN 20345 IS 15298 UK-2.5-13

10

IRIOMOTE

Ankle boot with black corrected grain leather upper
Grey synthetic mesh lining
Removable EVA laminated woven polyester insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

MANX LITE

Low ankle shoe with black meena print leather upper
Grey synthetic mesh lining
Removable EVA laminated woven polyester insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

MANX CLASSIC

Ankle boot with black meena print leather upper
Grey synthetic mesh lining
Removable EVA laminated woven polyester insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

TIGLON 3300

Low ankle shoe with black barton grain leather upper
Grey airmesh lining with blue cordura collar and tongue
Removable EVA laminated woven polyester insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

TIGLON 3700

Low ankle shoe with black barton grain leather upper
Black cambrelle lining
Removable EVA laminated woven polyester insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

TIGLON 3600

Ankle boot with black barton grain leather upper
Cambrelle black lining
Removable EVA laminated woven polyester insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

LIGER L

Low ankle shoe with meena print leather upper
Grey cambrelle lining
Removable EVA laminated woven polyester insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

LIGER H

Ankle boot with meena print leather upper
Grey cambrelle lining
Removable EVA laminated woven polyester insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

KORAT

Low ankle shoe with black barton grain leather
Red drilex lining
Removable EVA laminated woven polyester insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

CARACAL

Ankle boot with black barton grain leather upper
Cambrelle black lining
Removable EVA laminated woven polyester insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

MONT BLANC

Low ankle shoe with barton grain black leather upper
Grey airmesh lining
Removable EVA laminated woven polyester insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

DEVON

Low ankle shoe with black wood print leather upper
Red drilex lining with blue cordura tongue and collar
Removable EVA laminated woven polyester insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

SELKRIK REX

Low ankle safety shoe with black barton grain leather upper
Black and yellow drilex lining
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

CORNISH REX

Low ankle shoe with black nubuck grain leather upper
Orange drilex lining
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

RUFUS K01

Low ankle shoe with black microfibre upper with green piping
Black drilex lining
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

PREMIUM FOOTWEAR

GUINA

Low ankle shoe with brown nubuck leather upper
Dark grey mesh fabric in tongue and collar
Removable polyester laminated EVA insocks

Yellow Mesh Lining

Dark Grey Mesh Fabric

Dual Density PU Sole

OLIVER®

Impact resistant | Energy absorbent | Anti-static | Puncture resistant | Oil resistant | Slip resistant | Hydrocarbon resistant

CE EN 20345 | IS 15298 | UK 2.5-13 | 10

ONTILLA

Ankle boot with brown nubuck leather upper
Dark grey mesh fabric in tongue and collar
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

COUGAR

Low ankle shoe with black barton grain leather upper
Black cambrelle lining
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

JAGUAR

Low ankle shoe with black corrected grain leather upper
Synthetic air mesh laminated foam lining
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

HATRICK

Ankle boot with black corrected grain leather upper
Split leather synthetic lining
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

CHEETAH

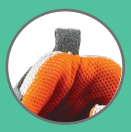
Low ankle perforated shoe with black barton grain leather upper
Black cambrelle lining
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

LUXURY FOOTWEAR

MARGAY

Low ankle shoe with nubuck and suede leather upper
Orange mesh lining
Removable polyester laminated EVA insocks



Orange Mesh Lining

Dual Density PU Sole

Nubuck and Suede Leather Upper

OLIVER®

Impact resistant | Energy absorbent | Anti-static | Puncture resistant | Oil resistant | Slip resistant | Hydrocarbon resistant

CE EN 20345 | IS 15298 | UK 2.5-13 | 10

OCELOT

Ankle boot with nubuck and suede leather upper
Orange mesh lining
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

PEDROFELES

Low ankle shoe with black nubuck leather upper
Yellow spacer lining
Removable polyester laminated EVA nsocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

PANTHER 7

Ankle boot with black barton grain leather upper
Moisture wicking 3D spacer lining and metatarsal buckle closure
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

PANTHER 8

Ankle boot with black barton grain leather upper
Moisture wicking 3D spacer lining and metatarsal velcro closure
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

PYTHON

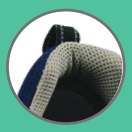
Ankle boot with black barton grain leather upper
Black cambrelle lining and metatarsal guard with steel buckle
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

COMFORT SPLIT FOOTWEAR

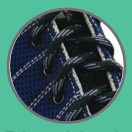
LEO B

Low ankle shoe with suede split leather
Grey mesh lining
Removable polyester laminated EVA insocks



Grey Mesh lining

Dual Density PU Sole



Blue Mesh Upper

MENNEC

OLIVER®

Impact resistant | Energy absorbent | Anti-static | Puncture resistant | Oil resistant | Slip resistant | Hydrocarbon resistant

CE EN 20345 | IS 15298 | UK 2.5-13 | 10

RUFUS M01

Low ankle shoe with black microfibre upper
Nylon mesh lining
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

RAGINI

Low ankle shoe with suede split leather and orange mesh upper
Grey mesh lining
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

LOW YORK

Low ankle shoe with suede split leather upper
Grey mesh lining
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

MANX SUEDE

Ankle boot with split suede leather upper
Black/Grey mesh lining
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

LEPERM

Low ankle shoe with suede split leather upper
Velcro fastening strap and grey air mesh lining
Removable polyester laminated EVA insocks

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

SPORTS SAFETY FOOTWEAR

FREDDIE G21

Aesthetically designed low ankle safety footwear
Removable polyester laminated EVA insocks
TPU shock absorber is available with dual density sole

Black Airmesh Lining

Dual Density Sole

Polyster Knitted Upper

FREDDIE H21

OLIVER®

Impact resistant | Energy absorbent | Anti-static | Puncture resistant | Oil resistant | Slip resistant | Hydrocarbon resistant

CE EN 20345 | IS 15298 | UK 2.5-13 | 10

FREDDIE H22

Aesthetically designed low ankle safety footwear
Removable polyester laminated EVA insocks
TPU shock absorber is available with dual density sole

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

FREDDIE G03

Aesthetically designed low ankle safety footwear
Removable polyester laminated EVA insocks
TPU shock absorber is available with dual density sole

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

FREDDIE H23

Aesthetically designed low ankle safety footwear
Removable polyester laminated EVA insocks
TPU shock absorber is available with dual density sole

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

FREDDIE G22

Aesthetically designed low ankle safety footwear
Removable polyester laminated EVA Insocks
TPU shock absorber is available with dual density sole

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

FREDDIE G23

Aesthetically designed low ankle safety footwear
Removable polyester laminated EVA insocks
TPU shock absorber is available with dual density sole

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

OCCUPATIONAL FOOTWEAR

CYMRIC K01 OB

Low ankle perforated shoe
Grey mesh nylon lining
Sandal design shoe with velcro fastening system

Grey Mesh
Nylon Lining

White Washable
Microfibre Upper

Velcro Fastening
System

OLIVER®

Impact resistant | Energy absorbent | Anti-static | Puncture resistant | Oil resistant | Slip resistant | Hydrocarbon resistant

CE EN 20347 | IS 15298 | UK 2.5-13 | 10

CYMRIC J03 O2

Low ankle shoe with black washable microfibre upper
Slip-on shoe design with grey mesh nylon lining
Ideal for janitorial applications

EN 20347 IS 15298 UK 2.5-13 10 OLIVER®

CYMRIC J01 OB

Perforated Low ankle shoe with black washable microfibre upper
Grey mesh nylon lining
Sandal shoe design with velcro fastening system

EN 20347 IS 15298 UK 2.5-13 10 OLIVER®

CYMRIC K02 OB

Low ankle shoe with white washable microfibre upper
Clog design with snap button fastening system
Ideal for healthcare operators

EN 20347 IS 15298 UK 2.5-13 10 OLIVER®

CYMRIC J02 OB

Low ankle shoe with white washable microfibre upper
Clog design with snap button fastening system
Ideal for hospitality management worker

EN 20347 IS 15298 UK 2.5-13 10 OLIVER®

CYMRIC K03 O2

Low ankle shoe with white washable microfibre upper
Slip-on shoe design with grey mesh nylon lining
Ideal for clean room applications

EN 20347 IS 15298 UK 2.5-13 10 OLIVER®

ECONOMY FOOTWEAR

DOXLE

Low ankle shoe with black whisker print leather upper
Yellow drilex lining
Removable EVA footbed with extra cushioning

Yellow Drilex Lining

Black Whisker Print Leather Upper

Single Density PU Sole

GARUD®

Impact resistant | Energy absorbent | Anti-static | Puncture resistant | Oil resistant | Slip resistant | Hydrocarbon resistant | Ladder grip

EN 20345 IS 15298 UK 2.5-13

10

LOREX

Low ankle shoe with black barton grain upper
Lined with split/synthetic material
Direct injected single density PU sole

EN 20345 IS 15298 UK 3-12 10 TIGER®

HIGHLANDER

Low ankle shoe with dark tan barton grain leather upper
Cambrelle lined collar
Direct injected single density PU sole

EN 20345 IS 15298 UK 2.5-13 10 TIGER®

BIRMAN

Low ankle shoe with black barton grain leather upper
Cambrelle lined collar
Direct injected dual density PU sole

EN 20345 IS 15298 UK 2.5-13 10 TIGER®

PAMPAS

Low ankle shoe with black barton grain leather upper
Synthetic cambrelle lining
Direct injected dual density PU sole

EN 20345 IS 15298 UK 2.5-13 10 TIGER®

CIVET

Low ankle shoe with black barton grain leather upper
Synthetic cambrelle lining
300°cel. contact heat-resistant PU/Nitrile rubber sole

EN 20345 IS 15298 UK 2.5-13 10 OLIVER®

ECONOMY FOOTWEAR

DOCKER

Ankle boot with black whisker print leather upper
Yellow drilex lining
Removable EVA footbed with extra cushioning

Whisker Print Leather Upper

Yellow Drilex Lining

Single Density PU Sole

GARUD®

CE EN 20345 IS 15298 UK 2.5-13 10

LEOPARD

Ankle boot with black barton grain upper
Split/synthetic material lining
Direct injected single density PU sole

EN 20345 IS 15298 UK 3-12 10 TIGER®

NEOFELIS

Ankle boot with dark tan barton grain leather upper
Cambrelle lining
Direct injected single density PU sole

EN 20345 IS 15298 UK 3-12 10 TIGER®

MALKIN

Ankle boot with black barton grain leather upper
Cambrelle lining
Direct injected single density PU sole

EN 20345 IS 15298 UK 3-12 10 TIGER®

PALLAS

Ankle boot with black barton grain leather upper
Synthetic cambrelle lining
Direct injected dual density PU sole

EN 20345 IS 15298 UK 2.5-13 10 TIGER®

VIVVERA

Ankle boot with black barton grain leather upper
Synthetic cambrelle lining
18 KV electric shock resistant dual density PU sole

EN 20345 IS 15298 UK 2.5-13 10 TIGER®

HALF KNEE BOOT

SCAR B

Ankle boot with nubuck DIN black leather upper
Scuff cap is available
Removable polyester laminated EVA insocks

Black Mesh Lining

Zip Fastening Closure

Nubuck DIN Black Leather Upper

SCAR W

OLIVER®

Impact resistant | Energy absorbent | Anti-static | Puncture resistant | Oil resistant | Slip resistant | Hydrocarbon resistant

CE EN 20345 | IS 15298 | UK 2.5-13 | 6

MANUL 1

Half knee desert tactical boot with beige suede leather upper
Moisture wicking 3D textile lining
EVA-rubber stuck on sole

EN 20347 IS 15298 UK 6-12 6 ROC

MANUL 3

Half knee tactical boot with corrected grain leather upper
Non woven synthetic lining
Direct injected double density PU sole

EN 20347 IS 15298 UK 2.5-13 6 OLIVER®

MANUL 5

Half knee tactical boot with beige suede split leather upper
Camouflage cordura upper with non woven synthetic lining
EVA-rubber stuck on sole

EN 20347 IS 15298 UK 6-12 6 ROC

MANUL 7

Half knee tactical boot with non DIN suede split leather upper
Non woven synthetic lining
EVA-rubber stuck on sole

EN 20347 IS 15298 UK 6-12 6 ROC

HALF KNEE BOOT

YODDHA

Ankle boot with PU foam laminated canvas upper
Synthetic lining
Removable polyester laminated EVA insocks

Single Density PU Sole

Synthetic Lining

Canvas Upper

GARUD®

Impact resistant | Energy absorbent | Anti-static | Puncture resistant | Oil resistant | Slip resistant | Hydrocarbon resistant | Ladder grip

CE EN 20347 | IS 15298 | UK 2.5-13 | 6

VIK CLASSIC

Half knee boot with waterproof crazy horse leather upper
3D spacer lining
Direct injected dual density PU sole

EN 20345 IS 15298 UK 2.5 - 13 6 GRIFFIN®

MALLARD 18

Ankle boot with viking hydro DIN leather upper
Air mesh lining
Direct injected dual density PU sole

EN 20345 IS 15298 UK 2.5 - 13 6 GRIFFIN®

CYPRUS

Knee boot with barton grain apollo print DIN leather upper
Non woven synthetic lining
Direct injected dual density PU sole

EN 20345 IS 15298 UK 8 - 9 6 GRIFFIN®

DALFON

Thigh boot with black PVC upper with 350 mm height
Nylon fabric lining
Dual density PVC outsole

IS12254 UK 2.5-13 6 JATAYU

HEAD PROTECTION

Few injuries are more fatal or more damaging than head injuries. Concessions, brain injuries, permanent or temporary brain damage are just a few of the possible outcomes of a blow to the head. Additionally, workers who are exposed to potential electric shock need to protect against that as well. Basic Personal Protective Equipment required for any worker is the safety helmet.

A. TERMINOLOGY

Bump Cap - Head protection gear designed for protection against low clearance objects only. A bump cap is not to be used in lieu of a hard hat where a hard hat is required.

Cap style - Refers to a safety helmet that has a brim on the front of the helmet only.

Brim - The rim surrounding the shell.

Full Brim - Refers to a safety helmet that has a brim that wraps around the entire safety helmet, as compared to the cap style safety helmet where the brim is only in the front of the safety helmet.

BUMP CAP CUSTOMIZATION:

Four Point Suspension - Refers to the number of clips that connect the suspension to the inside of the safety helmet. Safety helmets usually come in a four-point or a six-point suspension.

Chin strap - An adjustable strap that fits under the chin to secure the helmet on the head.

Pin lock - Refers to the safety helmet suspension that adjusts to the head size by means of a set of holes on the one side of the strap and little pins that snap into the hols on the other side.

Ratchet - Refers to the safety helmet suspension that adjusts to the head size using a ratchet adjustment knob. Simple, easy and quick, this allows the safety helmet to be fit tight and comfortably.

Harness - The complete assembly by means of which the helmet is maintained in position on the head, which includes headband, cradle, etc.

Headband - Part of harness surrounding the head

Slots - Refers to the slot in the side of the safety helmet that is designed to accept accessories such as ear muffs, face shields or other safety helmets

Anti -concussion Tapes - Supporting straps which form the cradle

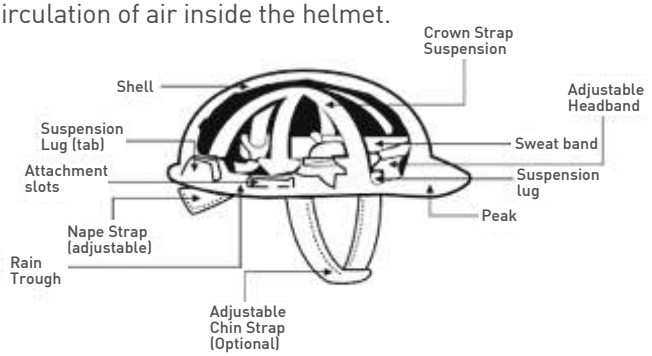
Cradle - The fixed or adjustable assembly comprising of anti-concussion tapes and nape strap, where provided.

Nape Strap - An adjustable (with respect to the shell) strap that fits behind the head to secure the helmet and may be an integral part of the helmet

Peak - The extension of the shell above the eyes.

Shell - The hard smoothly finished material that provides the general outer form of the helmet.

Ventilation Holes - Holes provided in the shell to permit circulation of air inside the helmet.



C.STANDARDS FOLLOWED

EN 397:1995 + A1:2012

Protective helmets for industry

This details physical and performance requirements, methods of test and marking requirements for general-use of industrial safety helmets. Performance requirements for the helmet shell are provided. Mandatory requirements such as shock absorption, resistance to penetration, flame resistance, chin strap anchorages, and label are addressed. Physical requirements for industrial safety helmets including materials and construction, external vertical distance. Internal vertical distance, internal vertical clearance, horizontal distance, and wearing height are included.

ANSI/ISEA Z89.1-2014 (R2019)

Revision of ANSI/ISEA Z89.1-2009. This standard establishes minimum performance and labelling requirements for protective helmets used in industrial and occupational settings under normal temperature conditions and optionally at high and low temperatures and when worn in the reversed position. It also includes requirements for high-visibility helmets and specifies test methods for evaluating all requirements.

Helmets conforming to the requirements of this standard are designated both by Type (based on location of impact force) and Class (based on electrical insulation) as well as any optional feature.

IS 2925:1984-Specification for Industrial Safety Helmets

This standard lays down the requirements regarding material, construction, workmanship and finish and performance requirements of helmets intended to provide Objective. The objective of this Standard is to specify protection against falling objects and other hazards which protective helmets that are to be worn in a variety of may be encountered in mining, tunnelling, quarrying, occupations, in order to reduce the severity of head shipbuilding, construction projects and similar other injury from hazards associated with such activities and industrial occupations.

EN 812:2012 - Bump caps for industry

These are essentially intended for inside use. A bump cap is not intended to protect against the effects of falling objects and must not under any circumstance replace a protective industrial helmet.

Difference between IS 2925:1984 & EN 397:2012

IS 2529:1984 and EN 397:2012, pertain to INDUSTRIAL SAFETY HELMET, but they cover different sets of regulations and guidelines. Here's a breakdown of the differences:

IS 2925:1984 (Indian Standard):

- Title: Industrial Safety Helmets
- Country: India
- **Scope:** This standard outlines the specifications for industrial safety helmets used to protect workers' heads from falling objects and accidental impact. It includes: Construction of the helmet.
  - Material specifications.
  - Tests for performance (impact resistance, penetration resistance, etc.).
  - Requirements for the suspension system (internal webbing or harness).
  - Marking and labeling.
- **Focus:** focuses on the basic specifications for industrial head protection used in India, including some general testing standards but may not cover as much detailed testing or standards as modern equivalents in global markets.

EN 397:2012 (European Standard):

- Title: Industrial Safety Helmets
- Country: Europe (adopted across EU member states)
- **Scope:** EN 397 covers industrial safety helmets for protection against impacts and falling objects. It provides detailed criteria for:
  - Material: The types of materials used in helmet construction, such as high-quality polymers and composites.
  - Design: Specific design and construction guidelines, including impact resistance and penetration resistance.
  - Performance Testing: It has more detailed testing protocols, such as testing for:
- Impact resistance (both front, top, and sides).
- Penetration resistance.
- Electrical insulation (for some helmets).
- Retention system performance (chin strap and fastening system).
- Temperature resistance (helmets are tested at extreme temperatures).
- **Flammability:**
  - **Marking:** More specific details about how the helmet should be marked with product type, manufacturer, and safety ratings.
  - **Focus:** EN 397 is more comprehensive in its scope, accounting for more detailed safety features, including helmet performance across a range of extreme conditions (such as temperature resistance and electrical hazards). It is widely recognized and used across Europe and many other countries.

Key Differences:

1. **Region of Application:**
   - 2425 is specific to India.
   - EN 397:2012 applies to the European Union and other international markets that accept European standards.
2. **Testing and Performance Requirements:**
   - EN 397:2012 provides more rigorous and detailed testing guidelines, including performance at extreme temperatures, electrical resistance, and additional safety features (like chin strap retention).
   - 1984 provides general testing, but it may not include the depth of tests found in EN 397, particularly around specific conditions like electrical insulation or flammability.
3. **Global Acceptance:**
   - EN 397:2012 is widely recognized and accepted globally, especially in the European Union.
   - 2425 is primarily used in India and may not be as widely recognized outside India.

In summary, EN 397:2012 offers a more thorough and internationally recognized framework for industrial helmets, with more detailed safety performance tests and updated materials.1984, while offering basic guidelines for helmet construction and performance, may not address all the latest global safety standards and testing.

AS/NZS 1801:1997 Australian/New Zealand Standard Occupational protective helmets

Objective The objective of this Standard is to specify protection against falling objects and other hazards which protective helmets that are to be worn in a variety occupations, in order to reduce the severity of head shipbuilding, construction projects and similar other injury from hazards associated with such activities.

Classification Three types of occupational protective helmets are specified in this Standard, namely:

(a) Type 1—general industrial safety helmets.

(b) Type 2—helmets intended for high temperature workplaces.

(c) Type 3—helmets intended for bushfire fighting

Table 1
Additional design and performance requirements for type 2 and 3 occupational protective helmets

Clause	Description	Hot work environments	Bushfire fighting
3.2.2	Brim	Type 2	Type 3
3.2.4	Shell conspicuity for special purposes	—	✓
3.3.5	Retaining strap for special purposes	—	✓
3.6.2 (d)	Ventilation - no holes or openings	—	✓
4.9.1	Very hot temperature requirement	✓	✓
4.9.2	Helmet shell materials flammability	✓	✓
4.9.3	Helmets for extermely high heat	—	✓
4.9.4	Resistance to ignition of associated materials	✓	✓

Electrical Resistance Test When helmets are tested in accordance with Appendix A, the leakage current shall not exceed 3 mA, and there shall be neither electrical discharge from the material nor flashover over the rim of the helmet. For underground mining applications, metal is acceptable as a means of securing the lamp bracket and cable clip. Helmets equipped with such accessories shall have metal items which penetrate the shell, suitably sealed and insulated.

Stiffness Test When helmets are tested in accordance with Appendix B, the deformation of the shell under a force of 90 11 N shall not exceed 15 mm when measured between 8 s and 10 s after application of this force.

Shock Absorption Test When helmets are tested in accordance with Appendix C, the impact of 50 11 J shall not cause the deceleration of the striker to exceed 980 m/s2, or the force transmitted to the head form shall not exceed 5.0 kN for any of the set of three conditioned helmets.

Resistance To Penetration When helmets are tested in accordance with Appendix D, the point of the striker shall not make contact with the headform.

Thermal Performance Application of fire hazard assessment The results of the tests specified below shall not be used as the only criteria for the description or appraisal of the fire hazard of the material or product under actual fire conditions. In general, tests of this nature are considered unsuitable alone for use in regulations relating to safety control and consumer protection, but find use in research and development, quality control, and material specifications.

4.8.2 Flame resistance resistance to ignition of helmet shell When helmets that have been previously conditioned at 50°C and subjected to the shock absorption test prescribed in Clause 4.6 are tested in accordance with Paragraph E4 (Test 1) of Appendix E, the material of the shell shall not burn with the emission of flame after a period of 5 s has elapsed following removal of the flame.

EYE PROTECTION STANDARDS FOLLOWED

EN 166:2001 Personal eye-protection against various dangers

The EN 166 standard is applicable to all types of personal eye protectors used against various dangers liable to damage the eye or to alter the vision, with the exception of radiation of nuclear origin, X rays, laser beams, infrared rays given out by sources at low temperatures.

The specifications of this standard are not applicable to eye protectors for which seperate and complete standards exist, such as anti-laser eye protector, all purpose solar spectacles, etc. The eye protectors fitted with corrective lenses are not exclused from the application field.

EN169: Ocular filters for welding and related techniques

The EN169 standard gives the grade numbers and the transmission specifications of the filters intended to ensure the protection of users carrying out welding, arc gauging and plasma arc cutting works.

The other requirements applicable for this type of filter are featured in the EN166 standard. The specifications for the welding filters with variable protection grade or double protection grade make the subject or the EN379 standard.

EN175 standard: Equipment for eye and face protection during welding and allied processes

The EN175 standard specifies the safety requirements and test methods relating to personal protective equipment used to protect the user's eyes and face against harmful optical radiation and against other specific risks due to usual welding processes, cutting or other related techniques.

The present standard specifies the protection, including ergonomic aspects, against different types of risks or dangers: radiation, flammability, mechanical risks, electrical risks. The equipment is designed to adjust protective filters with or without guard lenses or eyepiece of reinforcement, according to the recommendations of the protective equipment manufacturer for welding operations, in conformity with EN166 and EN169 standards or with EN379 standard.

APPLICATION CHART - TYPE OF THE GLASS

Standard symbol explanation

EN166	1	Optical class
EN166	F	Low energy impact
EN166	B	Medium energy impact
EN166	9	Non adherence of molten metal and resistance to penetration of hot solids
EN166	3	Protection against liquid droplets/splashes
EN166	8	Protection against short circuit electric arc
EN169	3	Filters for personal eyes-protection equipment used in welding and similar operations, scale number 3
EN169	5	Welding and braze welding of heavy metals. Welding with emitive fluxes (notably light alloys) oxygen cutting
EN169	8	Filters for personal eyes-protection equipment used in welding and similar operations. scalenumber 8
EN170	3-1	For use with sources which emit predominantly ultra violet radiation at wave lengths shorter than 313 mm and when glare is not an important factor. This coversn the UVC and most of the UVB bands
EN171	4-5	Protection against infra red radiations. Typical application in terms of mean temperature sources up to 1390°C

EAR PROTECTION

Determining the need to provide hearing protection for employees can be challenging.

ASSESSMENT FACTORS

- The loudness of the noise as measured in decibels (dB)
- The duration of each employee's exposure to the noise
- Whether employees move between work areas with different noise levels
- Whether noise is generated from one or multiple sources

GLOSSARY

Decibel - dB

A unit used to measure the intensity of a sound or the power level of an electrical signal by comparing it with a given level on a logarithmic scale. In general use, it is a degree of loudness.

SNR - Single Number Rating

Is a rating system set up by the European Union (EU). Tests are conducted by independent testing laboratories with no direct participation by manufacturers. The independent testing laboratories meet all of the regulatory requirements as set by the EU. The test results serve as a guideline to indicate the amount of potential protection, a hearing protection device will give in a noisy environment. This was established by the European Union and is aligned with the EN standard in Europe.

NRR - Noise Reduction Rating

Is a rating system set up by the Environmental Protection Agency (EPA) as a guideline that indicates the amount of potential protection a hearing protection device will give in a noisy environment. It is aligned with American ANSI standard. All tests are performed in a controlled environment. Consequently, posted NRR ratings are a qualified example of how the individual products compare with other similar hearing protection products in an uncontrolled noise environment. Test results do not evaluate the product reusability, comfort, adaptability or quality.

STANDARDS FOLLOWED

EN352-1 Muffs and headband

This section of the standard deals with head fasteners and establishes requirements in terms of manufacture, design and performance, test methods, instructions relating to marking and information intended for users.

EN352-2 Plugs and bands

This part of the standard also deals with individually moulded ear plugs and devices connected by band, although, it does not deal with the performances of electronic devices likely to be inserted in the ear plugs or on the case of amplitude sensitive plugs.

EN352-3 Muffs and helmet mounted

The present section of the standard stipulates requirements in terms of manufacture, design and performance, test methods, instructions relating to head fastener marking and information intended for head fastener users, when the latter are fixed on protective industrial helmets.

FACE PROTECTION

Respiratory masks give you a protection against respiratory attacks: dust - particulates, aerosols, fume or gas.

ASSESSMENT FACTORS

To choose the correct respiratory apparatus (half-mask or complete mask composed of one or two cartridges).

- Identify the type of risk: dust, fume, gas, vapours etc.
- Identify the toxic product
- Locate and record its toxicity (concentration)
- Compare with the AVE/LVE

DUST AND AEROSOL FILTERS

Type	Code	Protection
P1	White	Protects from coarse solid particles without specific toxicity (calcium carbonate)
P2	Yellow	Protects from solid and/or liquid aerosols warned to be hazardous or irritating (silica, sodium carbonate)
P3	Red	Protects from toxic solid and/or liquid aerosols (beryllium-radioactive particles)

B. TERMINOLOGY

Dust - Solid particles suspended in the air.

Fumes - Small particles suspended in the air.

Aerosols and Aqueous Fogs - Small droplets produced during pulverization.

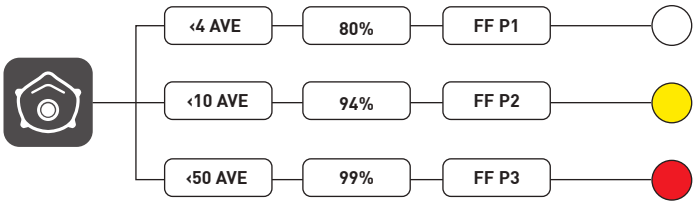
AVE (Average Value of Exposure) - It corresponds to the concentration measured over one reference period (one day of 8H for example). If the AVE exceeds the concentration to which an individual can be exposed without running any risk for his health, a protection is necessary. The AVE is indicated on the card of toxicity of the handled products.

LVE (Limit Value Exposure) - It is the measured concentration over a maximum time of 15 minutes that is advisable not to exceed.

CLASSIFICATION OF THE FILTERS

Class	FFP1	FFP2	FFP3
Minimum efficiency %	78%	92%	98%
Total inward leakage	22%	8%	2%
Filter efficiency of the filtering medium	80%	94%	99%
Nominal protection factor	4.5	12.5	50
Mean exposure value (MEV)	4X	10X	20X

FILTER EFFICIENCY



EN 136: Overall Masks

It contains laboratory tests and practical performance tests to check the conformity with resistance to temperature, impacts, flame, thermal radiation, traction, cleansers and disinfectants. Furthermore, the visual inspection must concern the marking and the manufacturer's information guide.

EN 140: Half masks and Quarter Masks

It contains laboratory tests and practical performance tests to check the conformity with resistance to impacts, cleaners, disinfectants, temperature, flame and respiratory resistance.

EN 143: Filters against particles

It contains laboratory tests to check the conformity with resistance to impacts, cleansers, disinfectants, temperature and flame. It also checks conformity with respiratory resistance.

EN 149: Filtering half masks

It contains laboratory tests to check the conformity with resistance to impacts, cleansers, disinfectants, temperature, flame. It also checks conformity with respiratory resistance.

The standards IS 9473:2002 and EN 149:2001 + A1:2009 both relate to respiratory protective devices, particularly filtering half masks that protect against particles, but they have different scopes, regions, and requirements. Here's a comparison of the two:

1. Standard Overview:

- IS 9473:2002: This is an Indian Standard for "Respiratory protective devices - Filtering half masks." It specifies the requirements for filtering half masks that are intended to protect against solid and liquid aerosols. IS 9473:2002 is specific to the Indian context.
- EN 149:2001 + A1:2009: This is a European Standard for "Respiratory protective devices – Filtering half masks to protect against particles." It specifies the performance requirements for filtering half masks (FFP masks) for use in environments with non-toxic, solid, and liquid particulates. The version with A1:2009 is an amendment to the original 2001 version.

2. Scope:

- IS 9473:2002: It focuses on performance characteristics like filtering efficiency, breathing resistance, and durability for use in industrial and construction environments in India.
- EN 149:2001 + A1:2009: Similarly, it defines the requirements for filtering half masks in European Union countries, with an emphasis on safety, performance, and testing. It also categorizes masks into three protection classes (FFP1, FFP2, FFP3), depending on their filtering efficiency.

3. Protection Classes:

- IS 9473:2002: It classifies masks into various grades based on the filtration efficiency and the type of particles. However, it doesn't always have the same classification nomenclature as the EN standard.
- EN 149:2001 + A1:2009: This standard explicitly defines three classes of filtering half masks:
  - FFP1: At least 80% particle filtration.
  - FFP2: At least 94% particle filtration.
  - FFP3: At least 99% particle filtration.

4. Testing and Performance Requirements:

- IS 9473:2002: Includes requirements for testing masks for properties such as filtration efficiency, breathing resistance, and leakage. It specifies testing for both internal and external leakages.
- EN 149:2001 + A1:2009: Includes detailed testing criteria, including inhalation and exhalation resistance, penetration, and total inward leakage, with specific values for each FFP class. It also provides specific testing methods for determining particle filtration efficiency.

5. Amendment Differences:

- EN 149:2001 + A1:2009: The amendment A1:2009 included updates to improve the testing of masks under more realistic conditions, considering factors like facial hair and mask fit. It also set stricter requirements for leakage rates. IS 9473:2002 does not have an equivalent amendment, and it may not include the most up-to-date testing methods that align with changes in international best practices like those in the European standard.

6. Regulatory Context:

- IS 9473:2002: It is enforced in India and serves as the benchmark for the quality and performance of respiratory protection devices within the country.
- EN 149:2001 + A1:2009: This is mandatory in the European Union and is used as the standard for respiratory protection devices sold within EU member states.

7. Market Specifics:

- IS 9473:2002: Tailored specifically for Indian industrial and commercial needs, this standard has been adopted by the Bureau of Indian Standards (BIS).
- EN 149:2001 + A1:2009: Applicable in the European market, this standard is aligned with the EU's regulatory framework for product safety and is often used internationally as well, especially for conformity marking with the CE label.

Key Differences:

1. Geographic Applicability:
   - o IS 9473:2002 applies to India.
   - o EN 149:2001 + A1:2009 applies to the European Union and some international markets.
2. Classifications:
   - o EN 149 provides specific classifications (FFP1, FFP2, FFP3) based on filtration efficiency, while IS 9473:2002 has its own classification system, which might not directly correlate to these levels.
3. Amendment Details:
   - o EN 149:2001 + A1:2009 includes updates that might not be reflected in IS 9473:2002.

In essence, the two standards share similarities in their goal to ensure the safety and effectiveness of respiratory protective devices, but they differ in their regional applicability, classification, and some of their technical requirements.

MEDICAL FACE MASKS

EN 14683:2020

This European Standard specifies construction, design, performance requirements and test methods for medical face masks intended to limit the transmission of infective agents from staff to patients during surgical procedures and other medical settings with similar requirements. A medical face mask with an appropriate microbial barrier can also be effective in reducing the emission of infective agents from the nose and mouth of an asymptomatic carrier or a patient with clinical symptoms.

Materials and construction

The medical face mask is a medical device, composed of a filter layer that is placed, bonded, or moulded between layers of fabric. The medical face mask shall not disintegrate, split, or tear during intended use.

Design

The medical face mask shall have a means by which it can be fitted closely over the nose, mouth, and chin of the wearer and which ensures that the mask fits closely at the sides. Medical face masks may have different shapes and constructions as well as additional features such as a face shield (to protect the wearer against splashes and droplets) with or without anti-fog function, or a nose bridge (to enhance fit by conforming to the nose contours.

Bacterial Filtration Efficiency (BFE)

The Bacterial Filtration Efficiency test determines the filtration efficiency by comparing the bacterial control counts to test article effluent counts. The test is conducted using Staphylococcus aureus as the challenge organism. After the filtration media is preconditioned, a liquid suspension of S. aureus is aerosolized and delivered to the filtration media at a constant flow rate of 28.3 litres per minute (LPM) or 1 cubic foot per minute (CFM)

Breathability

Air permeability of the mask, measured by determining the difference of pressure across the mask under specific conditions of air flow, temperature, and humidity The differential pressure is an indicator of the "breathability" of the mask.

Splash resistance

Splash resistance is the ability of a medical face mask to withstand penetration of synthetic blood projected at a given pressure.

Microbial cleanliness (Bioburden)

Cleanliness means freedom from population of viable micro-organisms on a product and/or a package, and freedom from particles that are contaminating a material and can be released but are not generated by mechanical impact

Biocompatibility

The manufacturer shall complete the evaluation of the medical face mask according to EN ISO 10993-1 and determine the applicable toxicology testing regime.

PRODUCT DESCRIPTION

Nonsterile disposable 3-layered surgical mask

Difference between IS 16289:2014 & EN 14683:2014

The key differences between IS 16289:2014 and EN 14683:2014 standards lie in their origin, scope, and application, though both are related to the performance requirements of medical face masks. Let's break down each one:

1. Origin and Jurisdiction

- IS 16289:2014: This is an Indian Standard (IS), developed by the Bureau of Indian Standards (BIS), specifically for medical face masks used in healthcare settings within India. It follows guidelines tailored to the Indian healthcare industry.
- EN 14683:2014: This is a European Standard, developed by the European Committee for Standardization (CEN). It applies to medical face masks used in European healthcare settings.

2. Scope and Application

- IS 16289:2014: This standard specifies the requirements for the construction, performance, and testing of medical face masks intended for use by healthcare professionals. It primarily focuses on the safety of both the wearer and the patient, and also provides guidance on bacterial filtration efficiency (BFE), particulate filtration efficiency (PFE), and breathability.
- EN 14683:2014: This standard is also focused on medical face masks but emphasizes similar aspects such as bacterial filtration efficiency, breathability, and microbiological safety. It includes different types of masks (Type I, Type II, and Type IIR), with Type IIR being resistant to splashes of fluids.

3. Classification and Mask Types

- IS 16289:2014: The Indian standard classifies medical face masks into two broad categories: masks for general use and surgical masks. It does not break masks into specific types like EN 14683.
- EN 14683:2014: This European standard includes three types of masks:
  - Type I: Masks for general medical use, with a lower filtration efficiency (minimum 95% BFE).
  - Type II: Surgical masks with a higher BFE (minimum 98% BFE).
  - Type IIR: Type II masks that also provide protection against splashes of body fluids.

4. Testing and Performance

- Both standards require testing for bacterial filtration efficiency (BFE), particulate filtration efficiency (PFE), and breathability, but there may be slight variations in the testing methods or criteria between the two.
- IS 16289:2014 includes more specific details about microbial cleanliness and testing protocols specific to the Indian context.
- EN 14683:2014 places more emphasis on splash resistance (for Type IIR masks) and more specific pass/fail criteria for the different types.

5. Regulatory Requirements

- IS 16289:2014: The compliance with this standard is required for the sale of medical masks within India and may be aligned with other local regulations or governmental health bodies in India.
- EN 14683:2014: Compliance with this standard is necessary for marketing and selling medical face masks in European Union (EU) countries. It is part of the conformity assessment for CE marking.

6. Other Considerations

- IS 16289:2014 may also include more details specific to the healthcare conditions prevalent in India, while EN 14683:2014 considers a wider range of healthcare environments across Europe, particularly with considerations for various levels of exposure to pathogens or body fluids.

In summary, both standards ensure the safety and effectiveness of medical face masks but are tailored to the regulatory environments of India (IS 16289:2014) and Europe (EN 14683:2014). EN 14683 has more detailed classifications, particularly with Type I, II, and IIR masks, while IS 16289 is more generalized for Indian usage.

PERFORMANCE REQUIREMENTS FOR MEDICAL FACE MASKS

Test	Type I	Type II	Type III
Bacterial filtration efficiency (BFE): The ability of the face mask to filter our bacteria so that they are not released into the user's surroundings (BFE), (%).	›95	98	98
Differential pressure: The lower this value, the easier it is for the user to breath normally (Pa/cm2).	.2›.4	.29.4	.49
Splash resistance pressure: The ability of the face mask to withstand the penetration of liquid splashes (kPa).	NA	NA	‹16.0
h1icrobial clean liness: Microbial cleanliness documents clean li- ness in the manufacturing process (cfu/g).	←30	←30	30

Type I medical face masks should only be used for patients and other persons to reduce the risk of spread of infections particularly in epidemic or pandemic situations. Type I masks are not intended for use by healthcare professionals in an operating room or in other medical settings with similar requirements.

HAND PROTECTION

Because of their tremendous versatility, hands are exposed and susceptible to many types of injuries. The common hazards against which hand protection needs to be routinely considered are mechanical hazards like :

a. Cutting
b. Punctures
c. Crushing
d. Pinches
e. Rotating equipment
f. Vibrating equipment

A. Environmental Hazards

a. Extreme temperatures
b. Electrical hazards

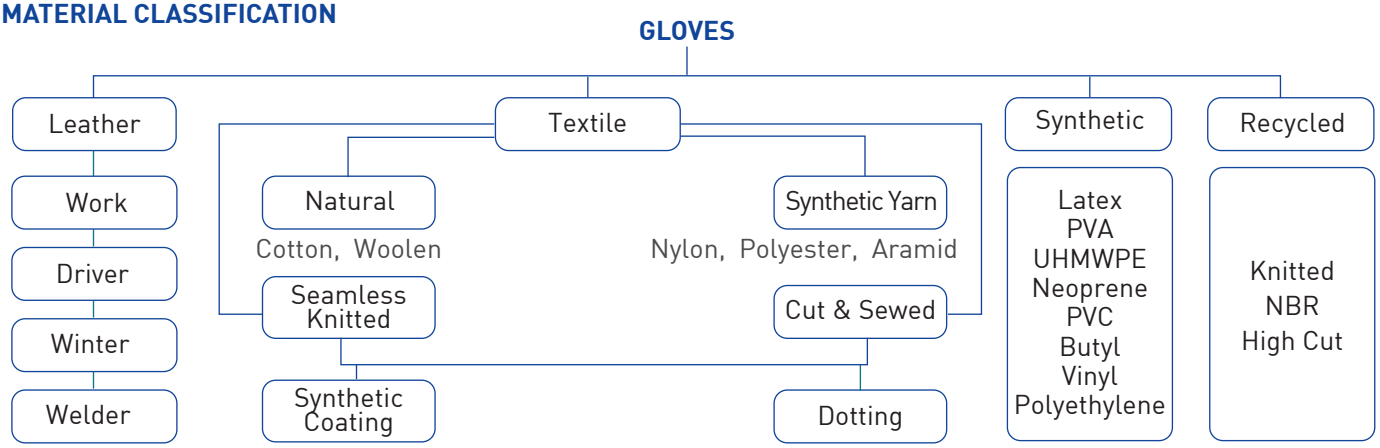
B. Contact with skin irritant substances

ASSESSMENT FACTORS

The need for hand protection should be assessed by conducting an assessment of potential workplace hazards. There are four interconnected factors to consider when selecting the best form of hand protection for the intended work.

a) The type of hazard (physical, mechanical, chemical, biological)
b) The nature of the task (regular process or incidental/ accidental)
c) User comfort (fit, dexterity) and
d) The workplace conditions (surface / ambient temperatures, wet/dry)

MATERIAL CLASSIFICATION



For a given weight, Kevlar is five times more resistant than steel. Twaron% is the para-aramid fibre from AKZO Nobel Para aramid %/Twaron% fibre gloves are 3 times more resistant to cuts than cotton gloves and 5 times more resistant than leather gloves. They have the following characteristics:

- Burns between 425°C and 475°C without melting
- Self-extinguishing (cannot burn without outside addition of fuel)
- Good chemical stability
- Soft to touch, comfortable, washable, good dexterity

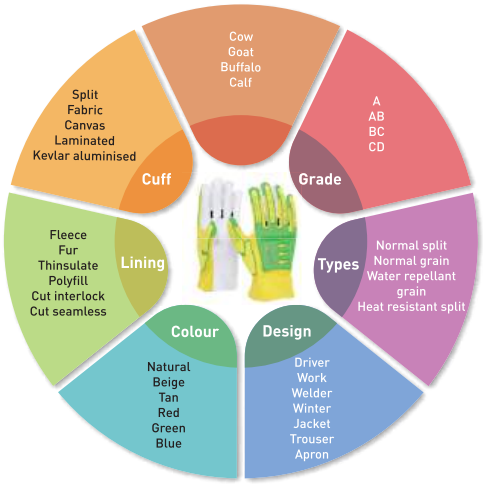
SUPPORTED GLOVES

Our technical seamless gloves are manufactured using fully automated machines, in our fully acclimatized production floors. The nitrile gloves plant manufactures heavy, medium and light dipped gloves, both in string knit as well as cut and sewn liners. Our production unit has knitting machines of 7, 10, 13 & 15 gauge and in pile construction. Keeping in mind the end users from various cross-sections of industries our units are equipped with machinery to knit from finer to coarser gauge products. We have a fully automated dipping process and the NBR is sourced from world famous manufacturers. Nitrile gloves are best when there is a need for greater in applications requiring mild chemical protection, cut resistance or a disposable glove solution.

LEATHER GLOVES

Leather Gloves are best for protection from rough objects, sparks and heat and in heavy-duty work requirements. All kinds of leather provide comfort, durability, dexterity, and mild heat resistance and abrasion protection. These advantages make leather a traditional favourite for industrial workers.

Humidity controlled shop-floor facilitates better handling and delivery of leather gloves. The cutting and sewing machines, which are of European make are ultra modern with a high reputation. Our strength lies in being able to manufacture very high-quality gloves using a combination of leather, Para -aramid fabrics and liners. Having our own tannery gives us the advantage of producing leather conforming to international norms



- Double stitching on all gloves with different pattern to five better appearance and tough stitching.
- Keystone thumb, Straight Thumb and wing thumb is possible.

STANDARDS FOLLOWED

Protective gloves can be divided into 3 categories depending on type and which risk or danger the gloves should protect against.

Category 1: Gloves of simple design, for minimal risks only. Example of gloves in this category are house-hold gloves used for cleaning and for protection against warm objects or temperatures not exceeding +50° C. Additional gloves in this category can include light-duty gardening gloves or other work where the risk for injury is minimal.

Category 2: Gloves of intermediate design, for intermediate risks. Gloves are placed in this category when the risk is not classified as minimal or irreversible. The gloves must be subjected to independent testing and certification by a Notified Body, whom then issues a CE marking showing the gloves protective capacities. In this category, you will find general handling gloves requiring good puncture and abrasion performance according to EN 388.

Category 3: Gloves of complex design, for irreversible or mortal risks. Gloves in this category are designed to protect aga inst the highest levels of risk e.g. hig hly corrosive acids. Gloves in this category must also be independently tested and certified by a Notified Body (approved by the EU commission).

EN 21420 - General Requirement

This standard defines the general requirements for glove design and construction, innocuousness, comfort and efficiency, marking and information applicable to all protective gloves.

Glove Construction and Design

- Gloves have to offer the greatest possible degree of protection in the foreseeable conditions of end use
- When seams are included, the strength of these seams should not reduce the overall performance of the glove.

Innocuousness

- The gloves themselves shouldn't cause any harm to the user o pH of the glove should be between 3.5 and 9.5
- Chromium (VI) content should be below detection (less than 3 ppm)

ABRASION RESISTANCE

The American standard ANSI/I SEA 105-2016 abrasion testing method measures the number of cycles required for an abrasion wheel to break down the glove material. Levels 0 to 3 are measured with a SOO gram load on the abrasion wheel while levels 4 to 6 are measured with a 1,000 gram load. The glove material is then mounted and abraded by the spinning wheel until the material is worn through, creating a hole, under the corresponding weight. The greater the number of cycles it takes to break the material down, the higher the abrasion rating. The average of a minimum of 4 speciments shall be used to report the classification level. The results are shown in the ANSI abrasion standard rating chart below: ABRASION LEVEL RATING 0 1 2 3 4 5 6 5 6 Gram load SOO SOO SOO 1000 1000 1000 Abrasion cycles to fail.

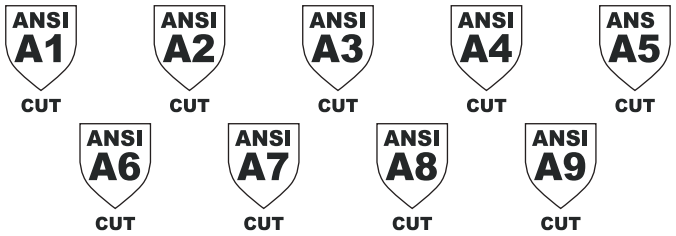
Performance Level	Load Applied	Cycle to Failure
Level 0	500 grams	Less than 100
Level 1	500 grams	100 to 499
Level 2	500 grams	500 to 999
Level 3	500 grams	1,000 to 2,999
Level 4	1,000 grams	3,000 to 9,999
Level 5	1,000 grams	10,000 to 19,999
Level 6	1,000 grams	20,000 or more

CUT RESISTANCE

When assessing cut resistance in gloves it can be good to understand both European and American cut resistance classification systems as many gloves will show both markings.

In US, the ANS/ISEA 105 standard include a cut resistance test with a scale with 9 levels of cut protection, A1-A9. The levels indicate how many grams required to cut through a sample using a rectangular blade in the specified cut test machine.

ANSI cut level	Load required to cut (grams of force)	Application Examples
A1	200-499 g	Light duty, paper handling
A2	500-999 g	General assembly, small parts
A3	1,000-1,499 g	Light metal stamping, small glass handling
A4	1,500-2,199 g	Sheet metal handling, moderate cut risks
A5	2,200-2,900 g	Heavy glass, metal fabrication, sharp meterials
A6	3,000-3,999 g	Sharp steel, high-risk environments
A7	4,000-4,999 g	Extreme cut hazards, heavy blaeds
A8	5,000-5,999 g	Industrial cutting, heavy mechinery work
A9	6,000+g	Maxmimum protection, ultra sharp risks



IMPACT RESISTANCE

There are two global standards when selecting an impact glove: EN 388 and ANSI/ISEA 138. Both standards have similar test methods where a weight is dropped on the impact areas with an energy of 5 joule. What differs is the scoring and rating system.

The American standard sets requirements of gloves designed to protect the knuckles and fingers from impact forces. The impact resistance is classified in 3 levels (1-3) where level 1 has the lowest protection and level 3 has the highest protection. Areas tested are knuckles at back of hand, fingers, and the thumb. The lowest performance value sets the overall protection leve.

Performance Level	Mean (KN)	All Impacts (KN)
1	<9.0	<11.3
2	<6.5	<8.1
3	<4.0	<5.0

ANSI / ISEA 138 ANSI / ISEA 138 ANSI / ISEA 138

EN 388:2016+A1:2018

Gloves giving protection from mechanical risks Protection against mechanical hazards is expressed by a pictogram followed by four numbers (performance levels), each representing test performance against a specific hazard.

1 Resistance to abrasion

Based on the number of cycles required to abrade through the sample glove (abrasion by sandpaper under a stipulated pressure). The protection factor is then indicated on a scale from 1 to 4 depending on how many revolutions are required to make a hole in the material. The higher the number, the better the glove.

2 Circular Blade cut resistance (Coup Test)

Based on the number of cycles required to cut through the sample at a constant speed. The protection factor is then indicated on a scale from 1 to 4.

3 Tear resistance

Based on the amount of force required to tear the sample. The protection factor is then indicated on a scale from 1 to 4.

4 Puncture resistance

Based on the amount of force required to pierce the sample with a standardly sized point. The protection factor is then indicated on a scale from 1 to 4.

5 Straight Cut Resistance (TDM -100 Test)

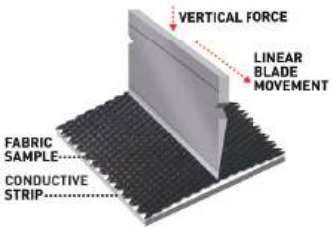
Based on the average load required to achieve a cut using a straight blade. The protection factor is then indicated on a scale from A to F.

6 Impact Resistance

An optional test based on the mean transmitted force which is intended for gloves designed for protection against impact. Gloves that do not offer impact protection will not be subjected to this test. For that reason, there are three potential ratings that will be given, based on this test. P (Pass), F (Fail}, and X (Not tested)

COUP TEST

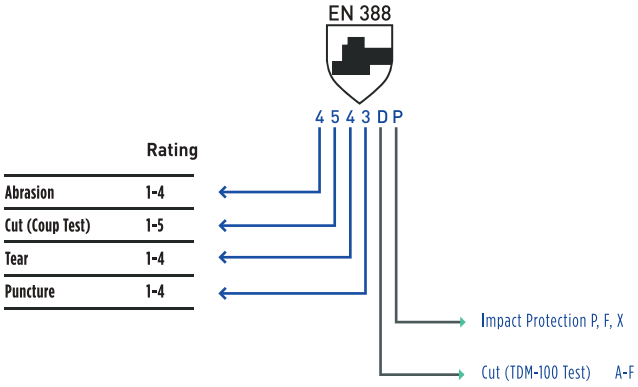
TDM-100 TEST



TEST	Performance				
	1	2	3	4	5
Abrasion Resistance (Cycles)	100	500	2000	8000	-
Blade cut Resistance (Factor)	1.2	2.5	5	10	20
Tear Resistance (Factor)	10	25	50	75	-
Puncture Resistance (Newton)	20	60	100	150	-

Perroamance Level	Blade cut Resistance (N)	Typical Applications
A	2-5 N	Light duty, tasks (e.g. general handling, werehouse work)
B	5-10 N	Medium-risk tasks (e.g. packaging, light assembly work)
C	10-15 N	Handling materials with moderate cut risks (e.g., metal stamping, automotive assembly)
D	15-22 N	High-risk environments (e.g., glass handling metal sheet cutting)
E	22-30 N	Heavy-duty protection (e.g., steel wire handling, sharp metal work).
F	30 N	Extreme cut risk (e.g., butchering, high-risk industrial tasks)

Impact Resistant Test with Standard 13594:2015		
P	Passed	←7.0 kN
F2	Failed	→9.0 kN
X	Not Tested	NA



a Resistance to flammability 0-4
b Contact heat resistance 0-4
c Convective heat resistance 0-4
d Radiant heat resistance 0-4
e Resistance to small splashes of molten metal 0-4
f Resistance to large splashes of molten metal 0-4

EN407 - Heat Protection

PERFORMANCE LEVELS	1	2	3	4
A. Burning behaviour (after flame & after glow time)	20s no requir.	<10s <120 s	<3s <25s	<2s <5s
B. Contact heat (cont. temp. & threshould time)	100°C >15s	250°C > 15s	350°C > 15s	500°C > 15s
C. Canvective heat (heat transafer delay)	>4s	>7s	>10s	>18s
D. Radiant heat (heat transfer delay)	>7s	>20s	>50s	>95s
E. Small drops molten mela (#drops)	>10	>15s	>25	>35
F. Large quantity molten metal (mass)	30g	60g	120g	200g

N 374 - Gloves giving protection from dangerous chemicals and micro-organism Chemical protective gloves must meet the requirements of the European standard EN 374. This standard has now been modified substantially. Gloves with long cuffs greater or equal to 400mm are also to be tested with samples taken at 80 mm from the end of cuff

EN ISO 374-1:2016 - Terminology and performance requirements for chemical risks

NEW	OLD
EN ISO 374-1:2016	EN 374-1:2003
"Protective gloves against dangerous chemicals and micro-organisms"	"Protective gloves against chemicals and micro-organisms"
Removal of reference to micro-organisms in the text (see new part 5)	Assumption of protection against micro-organisms
Number of test chemicals increased from 12 to 18	12 test chemicals
Beaker no longer used	Beaker for "waterproof protective gloves with limited protection against chemical dangers"
Gloves classified as type A, B or C	
Change of labelling on the product: pictogram of conical flask with differing number of letters for test chemicals per type	Pictogram of conical flask with at least 3 letters for test chemicals

3 specimens taken from the palm are tested for breakthrough times and the lowest is the result; the performance level is correlated with the breakthrough timetable. It is based on three test methods:

- Penetration test in accordance with standard EN 374-2: 2014
- Permeation test in accordance with standard EN 16523-1: 2015 which replaces standard EN 374-3
- Degradation test in accordance with standard EN 374-4: 2013

Type A: Protective glove with permeation resistance of at least 30 minutes each for at least 6 test chemicals.
Type B: Protective glove with permeation resistance of at least 30 minutes each for at least 3 test chemicals.
Type C: Protective glove with permeation resistance of at least 10 minutes for at least 1 test chemical.

NEW			OLD	
ISO 374-1-2016	ISO 374-1-2016/Type B	ISO 374-1-2016/Type C	EN 374:2003	EN 374:2003
JKLMNO	JKL	K	AKL	

The chemical permeation table now includes 6 new categories labelled M through T.

LIST OF HAZARDOUS COMPOUNDS			
CODE	CHEMICAL	CAS NUMBER	CLASS
A	Methanol	67-56-1	Primary Alcohol
B	Acetone	67-64-1	Ketone
C	Acetonitrile	75-05-8	Nitrile composite
D	Dichloromethane	75-09-2	Chlorinated hydrocarbon
E	Carbon disulphide	75-15-0	Organic compound containing sulphur
F	Toluene	108-88-3	Aromatic hydrocarbon
G	Diethylamine	109-89-7	Amine
H	Tetrahydrofuranne	109-99-9	Heterocyclic ether compound
	Ethyl acetate	141-78-6	Ester
J	n-Heptane	142-82-5	Saturated hydrocarbon
K	sodium hydroxide 40%	1310-73-2	Inorganic base
L	sulphuric acid 96%	7664-93-9	Inorganic mineral acid, oxidising
M	nitric acid 65%	7697-37-2	Inorganic mineral acid,oxidising
N	acetic acid 99%	64-19-7	Organic acid
O	ammonia 25%	1336-21-6	Organic base
P	hydrogen peroxide 30%	7722-84-1	Peroxide
S	hydrofluoric acid 40%	7664-39-3	Inorganic mineral acid
T	formaldehyde 37%	50-00-0	Aldehyda

EN 374-2:2014 -Determination of resistance to penetration. There are no significant changes.

EN 374-3:2003 - Determination of resistance to permeation by chemicals. This standard has been removed and replaced by EN 16523-1:2015, Determination of material resistance to permeation by chemicals — Part 1: Permeation by liquid chemical under conditions of continuous contact, in the Official Journal after harmonisation. There is no significant effect on the test method.

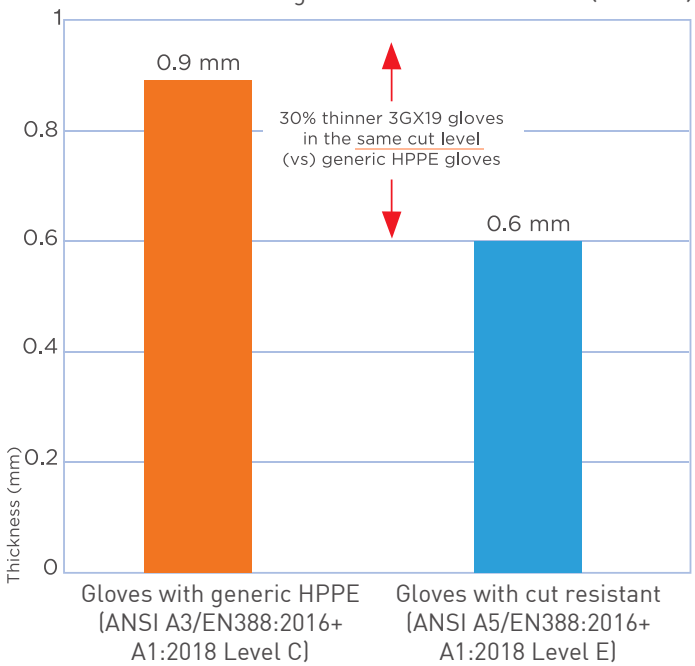
EN 374-4:2013 - Determination of resistance to degradation by chemicals. This part is new and takes into account the effect of degradation (change of glove material) by the chemical. Degradation can cause brittleness, swelling or shrinkage of the polymer material, for example. This is equivalent to a changing barrier function against the chemical. To be able to claim protection against a chemical of the list, permeation and from now degradation tests must be carried out. The results of the degradation test must appear in the information leaflet.

EN ISO 374-5:2015 - Terminology and performance requirements for micro-organisms risks. This standard is expected to become effective in 2017. It should be observed in particular for the risks of contact with micro-organisms (bacteria/viruses)

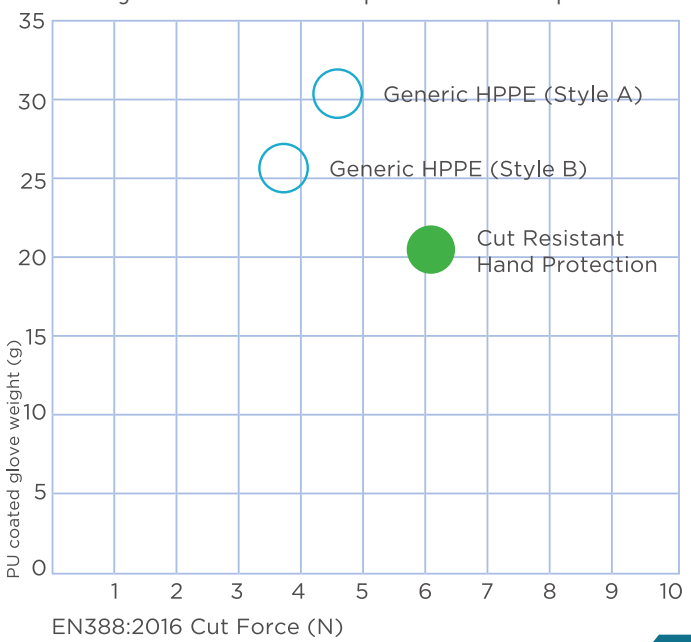
EN 511-2006 - This standard applies to any glove to protect the hands against convective and contact cold until the temperature goes down to - 50°C. The 'cold hazard' pictogram is accompanied by a 3 - digit number:

a. Resistance to convective cold (0-4)
b. Resistance to contact cold (0-4)
c. Permeability by water (0 or 1)

Thickness comparison between 13 gauge generic PE gloves and gloves with cut resistant hand protection fiber with similar range of cut resistance level B (ANSI A2)



Standard 13 gauge or 15 gauge PU coated glove weight and cut resistance performance comparison



BODY PROTECTION

EN ISO 11611:2015 specifies minimum basic safety requirements and test methods for protective clothing including hoods, aprons, sleeves and gaiters that are designed to protect the wearer's body including head (hoods) and feet (gaiters) and that are to be worn during welding and allied processes with comparable risks such as spatter (small splashes of molten metal), short contact time with flame, radiant heat from the arc, and minimizes the possibility of electrical shock by short-term, accidental contact with live electrical conductors at voltages up to approximately 100 V dc. ISO 11611:2007 does not cover requirements for hand protection.

ISO 11611:2015 specifies two classes with specific performance requirements, i.e., Class 1 being the lower level and Class 2 the higher level.

Class 1

Class 1 defines the protection against less hazardous welding techniques and situations, causing lower levels of spatter and radiant heat.

Class 2 defines the protection against more hazardous welding techniques and situations, causing higher levels of spatter and radiant heat.

ISO 11611:2015 specifies two classes with specific performance requirements, i.e., Radiant Heat & Flame spread test.

Radiant Heat

Class 1 is protection against less hazardous welding techniques and situations, causing lower levels of spatter and radiant heat.

Class 2 is protection against more hazardous welding techniques and situations, causing higher levels of spatter and radiant heat.

Flame Spread

Code letter A1 - 10s surface ignition (required) Code letter A2 - 10s edge ignition (optional)

{EN 1149) Electrical resistance

Should be higher than 105 ff

EN ISO 11612:2015 - Requirements for Fabric & Materials for Protective Clothing for Heat and Flame

ISO 11612:2015 specifies performance requirements for protective clothing made from flexible materials, which are designed to protect the wearer's body, except the hands, from heat and/or flame. For protection of the wearer's head and feet, the only items of protective clothing falling within the scope of ISO 11612:2015 are gaiters, hoods, and over boots.

The following types of protection, their letter code, and number codes means in EN ISO 11612:

EN 11612-A Flame Spreading

EN 11612-A is a test to determine the fire resistance of textiles and materials used in clothing, upholstery, and other products. Fabric and seams are flamed for 10 seconds during this test. As a result, the after-lamp time, afterglow time, and hole formation must remain within the values of the set standard.

Tests can be conducted in two ways:

- The mean value of after flame time shall be 2 for A2 & A1 is ←10 sec
- The mean value of afterglow time shall be s 2 for A2 & A1 is ←10 sec

EN 11612-B Convective Heat Resistance Test

In this test, the material is exposed to flames. The temperature rise at the top is measured by means of a calorimeter. It determines how much time (s) it takes to reach 24°C. As a result, the class is determined as follows:

- B1: from 4 to 10 seconds,
- B2: from 10 to 20 seconds,
- BE: 20 seconds and more

EN 11612-C Radiant heat

The test method consists of exposing the material to radiant heat by means of infrared. A calorimeter measures the temperature rise on the other side of the fabric. It measures how long it takes to reach a temperature rise of 24°C. Based on this, the class is determined:

- C1: 7 ← 20 seconds,
- C2: 20 ← 50 seconds,
- C3: 50 ← 95 seconds,
- C4: 95 seconds and longer

EN 11612D / E Molten Metal

In this test, molten metal splashes are measured for protection. On the back of the fabric is a membrane that simulates human skin. After this, aluminum molten (Code D) and iron molten (Code E) are applied. It

is possible that the membrane on the back of the fabric will not deform. The maximum allowable weight for splashes of molten metal is indicated in the following table:

- D1: between 100 grams and 200 grams
- D2: between 200 grams and 350 grams
- D3: 350 grams and more
- E1: between 60 grams and 120 grams
- E2: between 120 grams and 200 grams o E3: 200 grams and more

EN 11612-F Contact Heat The EN 11612-F test measures the protection of fabric against contact heat via clothing. In the test, the substance is brought into contact with a test object at 250 °C, and the time at which the heat reaches the back of the fabric is measured. Based on the measured threshold time, the achieved class is determined as follows:

- F1: 5 ← 10 seconds,
- F2: 10 ← 15 seconds,
- F3: 15 seconds and longer

NFPA 2112:2023- Standard on Flame-Resistant Clothing for Protection of Industrial Personnel Against Short-Duration Thermal Exposures from Fire

This standard shall provide minimum requirements for the design, construction, evaluation, and certification of flame-resistant garments, shrouds / hoods / balaclavas, and gloves, and cloth face coverings for use by industrial personnel, with the intent of not contributing to the burn injury of the wearer, providing a degree of protection to the wearer, and reducing the severity of burn injuries resulting during egress from or accidental exposure to short-duration thermal exposure from fire.

ASTM D7138 (thread melting resistance): Thread used in garments must be of flame-resistant fiber and not melt at 500°F.

ASTM D6413 (vertical flame resistance): When exposed to flame for 12 seconds, garment fabrics must:

- Self-extinguish (after flame) in 2 seconds or less
- Exhibit damage (char length) of 4 inches or less
- No melting or dripping can occu
- Fabric must meet these standards after 100 industrial laundering cycles.

ASTM F2894 (heat resistance): When exposed to 500°F for 5 minutes, garment fabrics must:

- Not ignite, melt, drip, or separate
- Not shrink more than 10%

ASTM F2700 (heat transfer performance): When exposed to combined convective and radiant heat at 2.0 cal/cm2/sec, garment fabrics must have a HTP rating of 3.0 cal/cm2 or greater (contact) and 6.0 cal/cm2 or greater (spaced)

ASTM F1930 (instrument manikin test): under simulated flash fire condition, predicted 2nd and 3rd degree total body injury is no more than 50% of total body surface area covered by sensors (less head, hands, and feet).

Label Print Durability Test: garment labels must remain legible and in place after 100 industrial laundering cycles.

Employees who face possible body injury of any kind that cannot be eliminated through engineering, work practice or administrative controls, are adviced to wear appropriate body protection suits while performing their tasks.

7 WAYS OF LOGO/LABELLING:

Testing details on STANDARD EN 343

EN343 testing methods

Water Repellency Test

The waterproofing (X) is measured using a hydrostatic pressure test. This involves applying a quantity of pressurised water to the garment, and the water penetration rating indicates the pressure it can withstand

Below is a breakdown of how the water penetration is classified; 8000 Pa (pascals) is equal to 1.16 psi (pounds per square inch). Water penetration is tested both before and after pre-treatments, which include abrasion, flexing and washing

Wp= Water Penetration Resistance
Pa= Pascal Pressure Units

EN343

Class	Water Penetration Resistance (WP)
1	› 8,000 Pa
2	› 8,000 Pa
3	› 13,000 Pa
4	› 20,000 Pa
Class	**Water VaporResistance (Ret)**
1	Ret › 40 m^2.Pa/W
2	25 ‹ Ret ‹ 40 m^2.Pa/W
3	15 ‹ Ret ‹ 25 m^2.Pa/W
4	Ret › 15 m^2.Pa/W

Breathability test

he breathability (Y) is tested in accordance with ISO 11092. A skin model is used to replicate human skin and measures water vapour resistance, which is initially expressed as an RET number (Resistance of Evaporation of a Textile). The lower the RET rating, the greater the breathability, and therefore the higher the item will score in the overall EN 343 rating.

Once the garment breathability has been classed as 1, 2 or 3, you can refer to the recommended wearing times below when working in various temperatures. These times can be prolonged where there are breaks in the work, or the garment has effective openings for ventilation.

Table showing recommended maximum continuous wearing time in minutes for a complete suit, consisting of jacket and trousers without thermal lining.

	Class 1	Class 2	Class 3
Amblent working temperature	RET>40	20<RET 40	RET>20
25°C	60 mins	105 mins	205 mins
20°C	75 mins	250 mins	No limit
15°C	100 mins	No limit	No limit
10°C	240 mins	No limit	No limit
5°C	No limit	No limit	No limit

EN 342:2017 Protection Against Cold

Products are tested by measuring the insulation for an ensemble (jacket, trouser) worn. Air permeability and breathability are also measured. Figures (1, 2 or 3) are given against "X" for insulation, "Y" for air permeability and "Z" for breathability. Higher the number, better the results.

X Insulations; actual data (higher figure is best

Y Air permeability; level 1, 2 or 3

Z Breathability; level 1, 2 or 3

CATEGORY II

Covers products intended to be used in environments with risk for severe, but no fatal consequences. The products must be tested and certified by a notified body. Products under this category are flame retardant clothing (EN 531/533/16112), clothing for high visibility (EN 471) and lifejackets (EN 395, 396 and 399), and buoyancy aids (EN 393)

EN ISO 20471:2013 + A1:2016

EN ISO 20471:2013 & A1:2016 is an international standard for the safety requirements and test methods of high visibility clothing. It specifies requirements for "high visibility clothing which is capable of visually signalling the user's presence". It states that high visibil- ity clothing is intended to provide conspicuity of the wearer in any light condition when viewed by operators of vehicles or other mechanised equipment during daylight conditions and under illumination of headlights in the dark.

The standard sets out performance requirements for colour and retroreflection as well as for the minimum areas and for the placement of the materials in protective clothing. It categorises high visibility garments into three classes; Class 1, Class 2, and Class 3 (see below).

All garments, such as vests, t-shirts, polo shirts, trousers and jackets, etc., should be labelled with the EN ISO 20471 icon and accompanied by the appropriate class number.

This is an example of how the label would look for a Class 2 garment:

Performance requirements for high visibility clothing EN ISO 20471 sets out design and performance requirements of each element of a garment. There are usually three main components:

1. The fluorescent background material This boosts visibil- ity during daylight hours and can also increase visibility at night. There are 3 colours approved in the standard, - Yellow, Orange-Red and Red.
2. The retroreflective strips These are designed to enhance visibility during the darker hours of the day. Reflective strips require a light source to work and create retroreflection. They are essential for those working at night.
3. The contrast material Some high visibility clothing is designed with darker coloured parts that are less sensi- tive to dirt than the fluorescent material and reflective strips, without which the functionality would diminish. The areas covered with the contrast fabric tend to be where dirt is most likely to build up — for example, the sleeve ends and across the abdomen on high visibility fleeces and jackets, and the ankle and knee sections of high visibility work trousers and waterproof trousers.

Classes of high visibility clothing

Three classes of garment are defined based on three different minimum areas of retroreflective, fluorescent and/or combined performance materials.

Table 1 Minimum required areas of visible material in m^2

Material	Class 3 garments	Class 2 garments	Class 1 garments
Background material	0.80	0.50	0.14
Retroreflective material	0.20	0.13	0.10
Combined performance material	n.a.	n.a.	0.20
Note: The clothing class determined by the lowest area of visible material			

ARC TESTING METHODS:

1. OPEN ARC TEST METHOD {IEC 61482-1-1}

IEC 61482-1-1 is the Open Arc Test Method. It determines the Arc Thermal Protection Value (ATPV level) of the garment. The basic principle is that the ATPV of the garment must be higher than the Arc Flash energy level as calculated. The Arc Rating is expressed in cal/cm' (Calories per centimetre square).

2. BOX TEST METHOD {IEC 61482-1-2}

IEC 61482-1-2 is the Box Test Method. It determines the Arc Protection Class Rating of the material or garment by using a constrained and directed arc:

- Class 1 offers protection against electric arc 4kA (168 kJ)
- Class 2 offers protection against electric arc 7kA (320 kJ)

It is important to ensure that all garments have been tested fully and satisfy all the requirements of IEC 61482-2.

It is important to note that the requirements of the IEC 61482-2 standard do not address electric shock hazards. IEC 61482-2 is applicable in combination with other standards that cover such hazards

FEET PROTECTION

Mallcom is a pioneer in the manufacturing of directly injected polyurethane safety footwear. The process is used to make rugged shoes that tackle the challenges that workers are exposed to in construction, mining, metallurgical and other different industries. The uppers are made of leather in combination with various imported raw materials. Mallcom's shoes use imported steel plates and toe caps to protect its wearer from falling objects and penetration by sharp objects. Mallcom manufactures protective footwear as per EN 20345 and BIS 15298 standards.

B.STANDARDS

Protective footwear worn in the workplace is designed to protect the foot from physical hazards such as falling objects, stepping on sharp objects, heat and cold, wet and slippery surfaces, or exposure to corrosive chemicals.

ASSESSMENT FACTORS

- Impact (falling/flying objects)
- Penetration (sharp objects piercing foot/hand)
- Compression (roll-over or pinching objects)
- Chemical exposure (inhalation, ingestion, skin contact, eye contact or injection)
- Extreme temperatures (heat or cold)
- Vibration
- Exposure to electricity

B.STANDARDS

EN344-1/EN ISO 20344 - Overall Requirement

It may be used only in conjunction with standards EN345-1/EN ISO 20345, EN346-1/EN ISO 20346 and

EN347-1/EN ISO 20347, which specify the requirements for the shoes as a function of specific levels of risk involved

The current standard for safety shoes EN ISO 20345: 2012 will be updated and will now instead be EN ISO 20345: 2022. So what is new and what will change? Here is a review of the most important changes point by point

SIZE CORRESPONDANCE TABLE

Euro Size	39	40	41	42	43	44	45	46	47
UK Size	6	$6^{1/2}$	7	8	9	10	$10^{1/2}$	11	12
Mondo Point (cm)	25.9	26.6	27.3	27.9	28.6	29.3	29.9	30.6	31.3

COMPARATIVE STUDY BETWEEN EN 20345 STANDARD OLD AND NEW VERSION

BASIC REQUIREMENT		NEW CLAUSE NO.	EN 20345:2011	EN 20345:2022	REMARKS
Classification	Class I Footwear	4.0 Classification and designs	Yes	Yes	
	Class Ii Footwear	4.0 Classification and designs	Yes	Yes	
	Hybrid Footwear	4.0 Classification and designs	No	Yes	New Entry At 2022 Version
Design	Height Of Upper	5.2.2 Height of upper	Yes	Yes	New Entry At 2022 Version
	Heel Area (Design A)	5.2.3 Seat region	No	Yes	
	Heel Area (Design B, C, D, E)	5.2.3 Seat region	Yes	Yes	
Whole Footwear	Constructional Performance	5.3.1 Sole performance	Yes	Yes	
	Construction	5.3.1.1 Construction	Yes	Yes	
	Upper/outsole Bond Strength	5.3.1.2 Upper/outsole bond strength	Yes	Yes	
	Toe Protection	5.3.2 Toe protection	Yes	Yes	
	General	5.3.2.1 General	Yes	Yes	
	Internal Length Of Toecaps	5.3.2.2 Internal length of toecaps	Yes	Yes	New Entry At 2022 Version
	Width Of Toe Cap Flange	5.3.2.3 Impact resistance of safety footwear	No	Yes	
	Corrosion Resistance	5.3.2.4 Compression resistance of SF	Yes	Yes	New Entry At 2022 Version
	Behaviour Of Toecaps (Thermal And Chemical)	5.3.2.5 Behaviour of toecaps	No	Yes	Clause No. Change At New Version
	Impact Resistance	5.3.2.6 IMPACT RESISTANT	Yes, Cl: 5.3.2.3	Yes	Clause No. Change At New Version
	Compression Resistance	5.3.2.7 COMPRESSION RESISTANCE	Yes, Cl: 5.3.2.4	Yes	
	Leak Proofness	5.3.3 LEAK PROOFNESS	Yes	Yes	
	Specific Ergonomic Features	5.3.4 Specific ergonomic features	Yes	Yes	
	Slip Resistance	5.3.5 Slip resistance requirement	Yes	Yes	
	A. On Ceramic Floor With Nals (Marking Sra)		Yes, Cl: 5.3.5.2	X	
	B. On Steel Floor With Glycerine (Marking Srb)		Yes, Cl: 5.3.5.3	X	
	C. Both A & B (Marking Src)		Yes, Cl: 5.3.5.4	X	New Entry At 2022 Version
	D. "Not-tested" Symbol Ø	5.3.5.1 General	No	Yes	New Entry At 2022 Version
	E. On Ceramic Floor With Nals (No Marking/symbol)	5.3.5.2 Slip resistance on ceramic tile floor with sodium lauryl sulphate (NaLS) solution	No	Yes	
	Innocuosness	5.3.6 Innocuousness	Yes	Yes	New Entry At 2022 Version
	Seam Strength	5.3.7 SEAM STRENGTH	No	Yes, For Hybrid Footwear	New Entry At 2022 Version
	Water Resistance	6.2.5 Water resistance	Not In Basic Req, App. For	Yes, For Hybrid Footwear	
Upper	General	5.4.1 General	Add.	Yes	New Entry At 2022 Version
	Height Of The Area Where Upper Requirements Apply (Class I)	5.4.1.1 Class I footwear, determination of the area where upper requirements apply	Yes	Yes	New Entry At 2022 Version
	Height Of The Area Where Upper	5.4.1.2 Hybrid foot wear, determination of the area where upper requirements apply	No	Yes	
	Requirements Apply (Hybrid)		No		
	Thickness	5.4.2 Thickness	Yes	Yes	
	Tear Strength	5.4.3 Tear strength	Yes	Yes	
	Tensile Properties	5.4.4 Tensile properties	Yes	Yes	
	Flexing Resistance	5.4.5 Flexing resistance	Yes	Yes	New Entry At 2022 Version
	Water Vapour Permeability And Coefficient	5.4.6 Water vapour permeability and coefficient	Yes	Yes	New Entry At 2022 Version
	PH		Yes	No, Add On Cl: 5.3.6	New Entry At 2022 Version
	Resistance To Hydrolysis	5.4.7 pH value	Yes, Ci: 5.4.8	Yes	
	Chromium Vi Content	5.5.2 Abrasion resistance	Yes	No, Add On Cl: 5.3.6	
Vamp, Quarter & Seat Lining	Tear Strength	5.5.3 Water vapour permeability	Yes, Cl: 5.5.1	Yes	
	Abrasion Resistance	and coefficient	Yes, Cl: 5.5.2	Yes	New Entry At 2022 Version
	Water Vapour Permeability & Coefficient	5.5.4 pH value	Yes, Cl: 5.5.3	Yes	New Entry At 2022 Version
	PH		Yes, Cl: 5.5.4	No, Add On Cl: 5.3.6	
	Chromium Vi Content		Yes, Cl: 5.5.5	No, Add On Cl: 5.3.6	New Entry At 2022 Version
Tongue	Tear Strength	5.6.2 pH value	Yes, Cl: 5.6.1	Yes	New Entry At 2022 Version
	PH		Yes, Cl: 5.6.2	No, Add On Cl: 5.3.6	
	Chromium Vi Content		Yes, Cl: 5.6.3	No, Add On Cl: 5.3.6	
Insole,insock And Footbed	Thickness	5.7.1 Thickness	Yes	Yes	New Entry At 2022 Version
	Water Permeability	5.7.2 pH value	Yes, Cond.	Yes	New Entry At 2022 Version
	Water Absorption & Desorption	5.7.3 Water absorption and desorption	Yes	Yes	New Entry At 2021 Version
	Insole Abrasion	5.7.4.1 Insoles	Yes	Yes	
	Insock Abrasion	5.7.4.2 Insocks	Yes	Yes	
	PH		Yes, Cl: 5.7.2	No, Add On Cl: 5.3.6	
	Chromium Vi Content		Yes, Cl: 5.7.5	No, Add On Cl: 5.3.6	
Outsole	General	5.8.1 Design	No	Yes	
	Design	5.8.2 Tear strength	Yes, Cl: 5.8.1	Yes	Clause No. Change At New Version
	Tear Strength	5.8.3 Abrasion resistance	Yes, Cl: 5.8.2	Yes	Clause No. Change At New Version
	Abrasion Resistance	5.8.4 Flexing resistance	Yes, Cl: 5.8.3	Yes	Clause No. Change At New Version
	Flexing Resistance	5.8.5 Hydrolysis	Yes, Cl: 5.8.4	Yes	Clause No. Change At New Version
	Hydrolysis	5.8.6 Interlayer bond strength	Yes, Cl: 5.8.5	Yes	Clause No. Change At New Version
	Interlayer Bond Strength	5.8.7 Interlayer bond strength	Yes, Cl: 5.8.6	Yes	Clause No. Change At New Version

ADDITIONAL REQUIREMENT		NEW CLAUSE NO.	EN 20345:2011	EN 20345:2022	REMARKS	NEW SYMBOL
WHOLE FOOTWEAR	Pentration Resistance	6.2.1 Perforation resistance	YES	YES, NAME CHANGE	New Entry At 2021 Version	
	A. Perforation Resistance - Metal Insert Type P	6.2.1.1.2 General	NO	YES	New Entry At 2021 Version	P
	B. Perforation Resistance - Nonmetal Insert Type Pl	6.2.1.1.3 Non – Metallic Perforation resistant inserts and insoles (Type PL)	NO	YES	New Entry At 2021 Version	PL
	C. Perforation Resistance - Nonmetal Insert Type Ps	6.2.1.1.4 Non – Metallic Perforation resistant inserts and insoles (Type PS)	NO	YES	New Entry At 2021 Version	PS
	Electrical Properties	6.2.2 Electrical properties	YES	YES		
	A. Partially Conductive Footwear	6.2.2.1 Partially conductive footwear	YES	YES, NAME CHANGE	New Entry At 2022 Version	C
	B. Antistatic Footwear	6.2.2.2 Antistatic footwear	YES	YES		A
	C Electrically Insulating Footwear	6.2.2.3 electrically insulating footwear	YES	NO	Delete At 2022 Version	
	Resistance To Inimical Environments	6.2.3 Resistance to inimical environments	YES	YES		
	A. Heat Insulation Of Outsole Complex	6.2.3.1 Heat insulation of sole complex	YES	YES		HI
	B. Cold Insulation Of Outsole Complex	6.2.3.2 Cold insulation of sole complex	YES	YES		CI
	Energy Absorption Of Seat Region	6.2.4 Energy absorption of seat region	YES	YES		E
	Water Resistance	6.2.5 Water resistance	YES	YES		WR
	Metatarsal Protection	6.2.6 Metatarsal protection	YES	YES		M
	Ankle Protection	6.2.7 Ankle protection	YES	YES		AN
	Cut Resistance	6.2.8 Cut resistance footwear	YES	YES		CR
	Scuff Cup Abrasion	6.2.9 Scuff cap abrasion	NO	YES	New Entry At 2022 Version	SC
	Slip Resistance On Ceramic Tile Floor With Glycerine	6.2.10 Slip resistance	NO	YES	New Entry At 2022 Version	SR
UPPER	Water Penetration And Absorption	6.3 Water penetration and absorption	NO	YES	New Entry At 2022 Version	WPA
OUTSOLE	Resistance To Hot Contact	6.4.1 Resistant to hot contact	YES	YES		HRO
	Resistance To Fuel Oil	6.4.2 Resistance to fuel oil	YES	YES		FO
	Ladder Grip	6.4.3 Ladder Grip	NO	YES	New Entry At 2022 Version	LG

MARKING CATEGORY	EN 20345:2011	EN 20345:2022	REMARKS
SB	For Class I And Class Ii	For Class I And Class Ii , Hybrid Footwear	
S1	As Sb, Plus	As Sb, Plus	
	Closed Heel Area	Closed Heel Area	
	Energy Absorption Of Seat Region	Energy Absorption Of Seat Region	
	Resistance To Fuel Oil	Na	Deleted At 2021 Version
	Antistatic	Antistatic	
S2	As S1, Plus	As S1, Plus	
	Water Penetration And Absorption	Water Penetration And Absorption	
S3 (Metal Insert Type P) Or	As S2, Plus	As S2, Plus	
S3l (Nonmetal Insert Type Pl) Or	Cleated Outsole	Cleated Outsole	
S3s (Nonmetal Insert Ps)	Penetration Resistance	Perforation Resistance	
S4	As Sb, Plus	As Sb, Plus	
	Closed Heel Area	Closed Heel Area	
	Energy Absorption Of Seat Region	Energy Absorption Of Seat Region	
	Resistance To Fuel Oil	Resistance To Fuel Oil	
	Antistatic	Antistatic	
S5 (Metal Insert Type P) Or	As S4, Plus	As S4, Plus	
S5l (Nonmetal Insert Type Pl) Or	Cleated Outsole	Cleated Outsole	
S5s (Nonmetal Insert Ps)	Penetration Resistance	Penetration Resistance	
S6	No	As S2, Plus	New Entry At 2022 Version
	No	Water Resistance Of Whole Footwear	New Entry At 2022 Version

MARKING CATEGORY	EN 20345:2011	EN 20345:2022	REMARKS
S7 (Metal Insert Type P) Or	No	As S3, Plus	New Entry At 2022 Version
S7l (Nonmetal Insert Type Pl) Or	No	Water Resistance Of Whole Footwear	New Entry At 2022 Version
S7s (Nonmetal Insert Ps)	No		New Entry At 2022 Version
SBH	Hybrid Footwear	Hybrid Footwear	

MARKING SYMBOL	EN 20345:2011	EN 20345:2021	REMARKS
PERFORATION RESISTANCE			
METAL INSERT - TYPE P	P	P	
NON-METAL INSERT - TYPE PL	XXX	PL	New Entry At 2022 Version
NON-METAL INSERT - TYPE PS	XXX	PS	New Entry At'rsion
ELECTRICAL PROPERTIES			
A. PARTIALLY CONDUCTIVE FOOTWEAR	C	C	
B. ANTISTATIC FOOTWEAR	A	A	
C ELECTRICALLY INSULATING FOOTWEAR		XXX	Deleted At 2022 Version
RESISTANCE TO INIMICAL ENVIRONMENTS	HI	HI	
A. HEAT INSULATION OF OUTSOLE COMPLEX	CI	CI	
B. COLD INSULATION OF OUTSOLE COMPLEX	E	E	
ENERGY ABSORPTION OF SEAT REGION	WR	WR	
WATER RESISTANCE	M	M	
METATARSAL PROTECTION	AN	AN	
ANKLE PROTECTION	CR	CR	
CUT RESISTANCE	XXX	SC	
SCUFF CUP ABRASION	WRU	WPA	New Entry At 2022 Version
WATER PENETRATION AND ABSORPTION	HRO	HRO	New Entry At 2022 Version
RESISTANCE TO HOT CONTACT	FO	FO	
RESISTANCE TO FUEL OIL	XXX	LG	
LADDER GRIP	SRA		New Entry At 2021 Version
SLIP RESISTANCE		XXX	
A. ON CERAMIC FLOOR WITH NaLS			Deleted At 2022 Version
B. ON STEEL FLOOR WITH GLYCERINE	SRB	XXX	Deleted At 2022 Version
C. BOTH A & B	SRC	XXX	Deleted At 2022 Version
D. IF "NOT-TESTED"	XXX	Ø	New Entry At 2022 Version
E. ON CERAMIC TILE FLOOR WITH NaLS	XXX	NO MARKING	New Entry At 2022 Version
F. ON CERAMIC TILE FLOOR WITH GLYCERINE	XXX	SR	New Entry At 2022 Version

ASTM F2412

Standard Test Methods for Foot Protection

The ASTM F2412 test methods measure resistance of footwear to hazards that may result in injury to the worker.

These methods may be used to test for compliance to minimum performance requirements in established safety standards. The test methods can be used to determine the effectiveness of the footwear to provide any one, or all of the following protections:

- Impact resistance to eliminate or diminish the severity of injury caused by objects striking the foot, and in particular in the toes and metatarsal region
- Reduced buildup of static electricity from the wearer to the ground Shock absorbance
- Puncture resistance and chain saw resistance
- Dialectic insulation to reduce the possibility of injury when exposed to a high voltage charge. Electrical hazard (EH) footwear is manufactured with non-conductive, electrical-shock-resistant soles and heels. The outsole is

intended to provide a secondary source of electric-shock-resistance protection to the wearer against the hazards from an incidental contact with live electrical circuits or electrically energized conductors, parts or apparatus. It must be capable of withstanding the application of 18,000 volts at 60 hertz for one minute with no current flow or leakage current in excess of one milliampere under dry conditions.

The standard describes the specific methods, including diagrams of the equipment used (when appropriate), to conduct the testing for each of the protections listed above.

Codes and requirements:

- **PL** - Perforation resistance (non metal insert)
- **PS** - Perforation resistance (non metal insert)
- **C** - Partly conductive footwear
- **A** - Anti-static footwear HI - Heat insulation of outsole complex
- **CI** - Cold insulation of outsole complex
- **E** - Energy absorption of seat region
- **WR** - Water resistance
- **M** - Metatarsal protection
- **AN** - Ankle protection
- **CR** - Cut resistance
- **SC** - Scuff cap abrasion
- **SR** - Slip resistance (ceramic tile floor with glycerine)
- **WPA** - Water penetration and absorption
- **HRO** - Resistance to hot contact
- **FO** - Resistance to fuel oil
- **LG** - Ladder grip

Ladder Grip

Previously, "heel grip for ladder" has been included in the standard for shoes intended for firefighters. That part has been copied for a stand-alone additional test for all safety shoes. This makes it possible to test all safety shoes with regard to step grip in the new standard. Please note that this is one of several additional tests that are not mandatory.

FO is no longer mandatory

The marking FO refers to the shoe sole's resistance to hydrocarbons (oils, petrol, etc.). This has previously been a mandatory part for protection level SI-S5, ie as soon as you do not have a shoe with an open heel. FO will henceforth be an additional test that can be done for shoes intended for environments with hydrocarbons, where relevant.

Water resistance

Two new levels of protection have been added; S6 and S7. What S6 and S7 have in common is that these protection levels have requirements for water resistance (Water-Resistant, marking WR). Otherwise, S6 means the same protection as the requirement for S2 but with additional requirements for water tightness (WR), while S7 is the same as S3 but with additional requirements for water tightness (WR).

An approved shoe with the marking S2 or S3 has according to the "old" standard a water repellent upper (WRU - Water Repellent Upper). However, only the material itself is tested to obtain WRU. When the material is included in a shoe, the shoe as a whole can lose its water-repellent ability because water penetrates into the seams.

In the new standard, the marking WRU disappears, instead we see the marking WPA (Water penetration and absorption) and the marking as already mentioned; WR.

SOLE NAME Specifications	TIGER	PHOENIX	DARWIN	OLIVER	GRIFFIN	GARUD
MATERIAL	PU	PU/PU OR PU/RUBBER	PU/PU OR PU/RUBBER	PU/PU OR PU/RUBBER	PU/PU	PU
DENSITY	SINGLE	DUAL-DENSITY	DOUBLE	DOUBLE	DUAL-DENSITY	SINGLE DENSITY
TPR INSERT	YES	YES	NO	YES	YES	NO
TOE CAP	STEEL	STEEL OR FIBREGLASS	STEEL	BOTH	STEEL OR FIBREGLASS	STEEL OR FIBREGLASS
BUMPER CAP	NO	NO	NO	YES	YES	NO

SB or S1 to S5 (safety footwear) - PB or P1 to P5 (protective footwear) - 01 to 05 (occupational shoes)			
CLASS 1 OR 2	**EN 345-1 / EN ISO 20345**	**EN 346-1 / EN ISO 20346**	**EN 347-1 / EN ISO 20347**
ALL MATERIALS	SB : basic properties	PB : basic properties	PB : basic properties
CLASS 1 ALL MATERIALS EXCEPT FOR NATURAL OR SYNTHETIC	S1 : basic properties plus : - closed back - antistatic - energy absorbing heel	P1 : basic properties plus : - closed back - antistatic - energy absorbing heel	O1 : basic properties plus :- closed back - hydrocarbon-resistant sole - antistatic - energy absorbing heel
	S2 : the same as S1 plus : - waterproof	P2 : the same as P1 plus : - waterproof	O2 : the same as O1 plus : - waterproof
CLASS 2 NATURAL AND SYNTHETIC POLYMERS	S3 : the same as S2 plus : - puncture resistant sole - studded sole	P3 : the same as P2 plus : - puncture resistant sole - studded sole	O3 : the same as O2 plus : - puncture resistant sole - studded sole
	S4 : basic properties plus : - antistatic - energy absorbing heel	P4 : basic properties plus : - antistatic - energy absorbing heel	O4 : basic properties plus : - antistatic - energy absorbing heel
	S5 : the same as S4 plus : - puncture resistant sole - studded sole	P5 : the same as P4 plus : - puncture resistant sole - studded sole	O5 : the same as O4 plus : - puncture resistant sole - studded sole

C. TERMINOLOGY

Safety Footwear - Footwear, incorporating protective features to protect the wearer from injuries which could arise through accidents, fitted with toe caps, designed to give protection against impact when tested at an energy level of at least 200 J and against compression when tested at a compression load of at least 15 kN

Full Grain Leather - Hide or skin tanned to be imputrescible having conserved the totality of its grain

Corrected Grain Leather - Hide or skin tanned to be imputrescible which has been subjected to mechanical buffing to modify its grain structure

Leather Split - Flesh or middle part of a hide or skin tanned to be imputrescible obtained by splitting a thick leather

Rubber Vulcanized elastomers

Polymeric Materials - For example polyurethane (PU) or polyvinyl chloride (PVC)

Insole - Non-removable component used to form the base of the shoe to which the upper is usually attached during lasting

Insock - Removable or permanent footwear component used to cover part or all of the insole

Lining - Material covering the inner surface of the upper

NOTE 1: The wearer's foot is in direct contact with the lining.

NOTE 2: Where an upper is split at the forepart to house the toe cap, or if an external piece of material is stitched to the upper to form a pocket to house the toe cap, the material under the toe cap acts as a lining.

Vamp Lining Material covering the inner surface of the forepart of the upper

Quarter Lining - h1aterial covering the inner surface of the quarters of the upper

Cleat(s) - Protruding part(s) of the outer surface of the sole

Rigid Outsole - Sole which, when the complete footwear is tested cannot be bent through an angle of 45 degrees under a load of 30N

Cellular Outsole Out sole having a density of 0.9 g/ml or less with acell structure visible under I0x magnification

Penetration-resistant Insert - Footwear component placed in the sole complex in order to provide protection against penetration

Safety Toe Cap - Footwear component built into the footwear designed to protect the toes of the wearer from impacts up to an energy level of at least 200 J and compression at a load of at least 15 kN

Seat Region - Back part of the footwear (upper and sole)

Conductive Footwear - Footwear whose resistance lies in the range of 0 to 100k

Antistatic Footwear - Footwear whose resistance lies above 100k and is less than or equal to 1,000M

Electrically Insulating Footwear - Foot w ea r which protects t he wea rer aga in st elec t r ica l sh ocks by preventing the passage of dangerous current through the body via the feet

Fuel Oil - Aliphatic hydrocarbon constituent of petroleum

Specific Job Related Footwear - Safety, protective or occupational footwear relating to a specific profession, e.g. footwear for firefighters, footwear with resistance to chainsaw cutting, etc.

Safety Footwear Standard – What are the changes?

The EN ISO 20345:2011 safety footwear standard has been replaced by the new EN ISO 20345:2022 standard. The standard has a transition period until the end of 2027, so there will be products on the market that are certified according to both the new and the old standard.

All Sievi products certified after 1 January 2023 have been tested according to the new EN ISO 20345:2022 standard.

1. Puncture resistance of the perforation-resistant insert

Penetration resistance

The term 'penetration resistance' for describing safety footwear will now be replaced by the phrase 'puncture resistance'. The puncture resistance test will now be carried out on the basis of ISO 22568-3 and ISO 22568-4 instead of EN 12568.

New symbols for the certification of safety footwear for puncture resistance have also now been added:

Symbol	Description
P	• For steel soles • At least 1,100 newtons of pressure • Tested with 4.5 mm nail
PL	• For non-metallic soles • With 1,100 newtons of pressure • Tested with 4.5 mm nail
PS	• For non-metallic soles • Average value of four tests must not be lower than 1,100 newtons • Tested with 3.0 mm nail

The protection markings for perforation-resistant insert can be, for example: S3S, S3L, S1P, S1PS, S1PL.

2. Slip resistance

In the previous standard, slip resistance was marked as follows: SRA, SRB and SRC.

In the new standard, slip resistance no longer has a separate letter symbol in the certificate as it is a basic requirement. The test is equivalent to the former SRA test carried out on a ceramic tile coated in a soap solution.

An additional feature is a test carried out on a ceramic tile with a glycerol solution. This is marked with SR (= Slip Resistance) in the certificate. The additional feature is not obligatory.

If it is not possible to carry out the slip resistance tests on special shoes or boots (e.g. footwear with integrated studs), they are marked with the symbol

3. Waterproof and water resistant

In the previous standard, water resistance of the upper material was marked with the symbol WRU (Water Repellent Upper).

In the new standard, water resistance of the upper material is marked with the symbol WPA (Water Penetration and Absorption). The waterproof feature is marked with WR (Water Resistance). There are also two new protection classes, S6 and S7, for waterproof footwear.

S6 = the footwear meets the requirements of class S2 and is also waterproof (WR).

S7 = the footwear meets the requirements of class S3 and is also waterproof (WR).

4. New additional features

Scuff cap (SC): In order to determine abrasion on the overcap, a Martindale abrasion test of 8,000 cycles will be carried out. According to the test, the overcap must not develop any holes across its entire thickness.

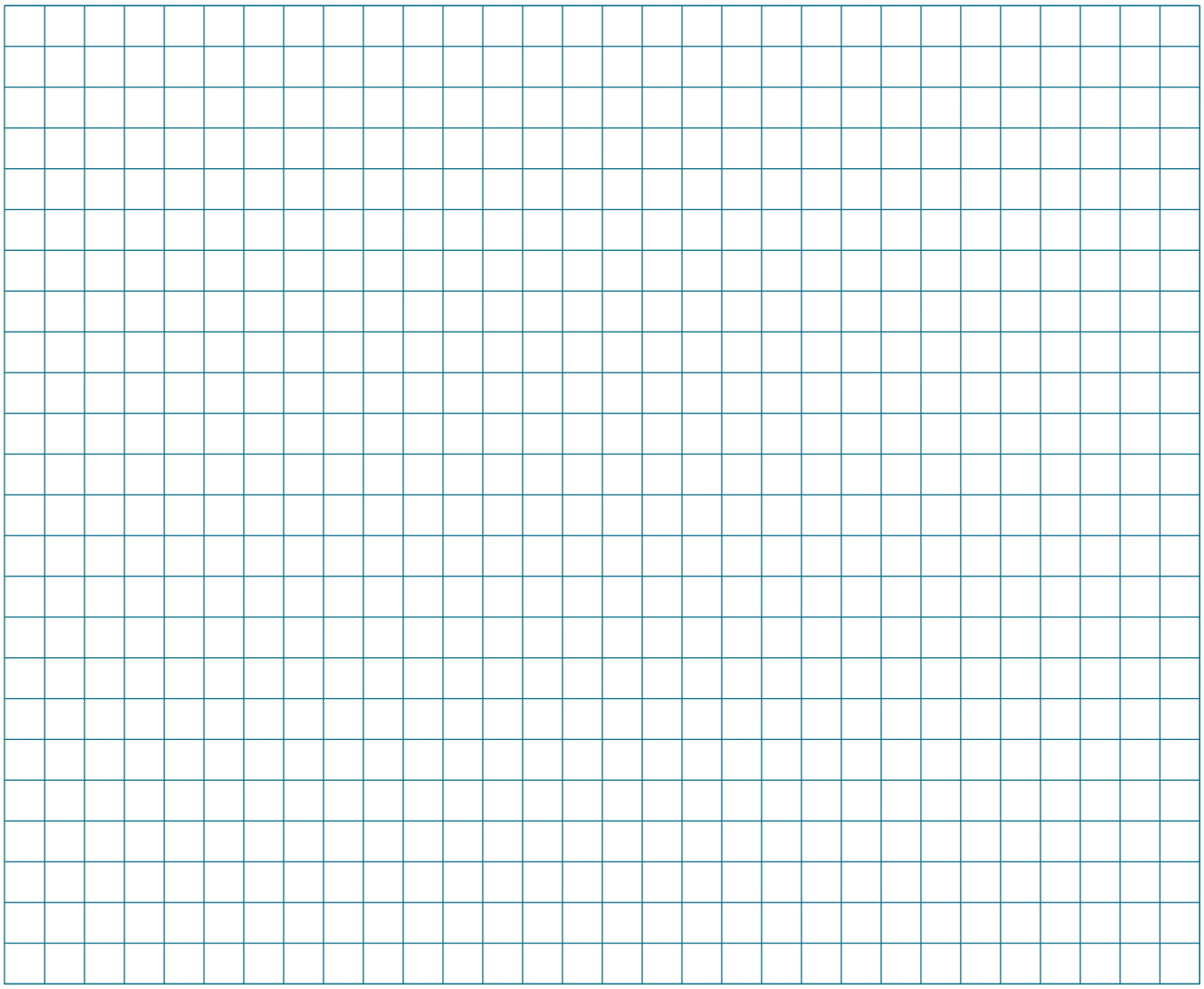
Slip resistance (SR): This new additional requirement tests the slip resistance of the safety shoes on ceramic tiles with glycerine. When the heel slides forward, a coefficient of friction of →= 0.19 mm is allowed. When the front part of the shoe slides backwards, a coefficient of friction of →= 0.22 mm is allowed.

Ladder grip (LG): To offer better grip on ladders, the outsole of a safety shoe must have a transverse profile with a height of at least 1.5 mm in the ankle area.

CROSS-SECTION OF A SAFETY SHOE

GLOSSARY OF ICONS:

Head Impact	Shock	Electrical Hazard	Bump	Puncture	Light & Comfortable	High visibility	Snuggly Fitting	Dust
Indoor & Outdoor	Anti Scratch	Anti Fog	Projectiles	Welding	Noise Reduction	UV	Microbe	Splash
Infrared	Cold Insulation	Water Repellent	Abrasion	Cut Proof	Tear	Dexterity	Hygienic	Flexible
Antistatic	Breathable	Low visibilty	Particle resistant	Multi Utility	Dotting	Reinforce	High Cut	Bio Hazard
Micro organism	Cryogenic	Rough	Extensive Length	Chemical Protection	Thermal Insulation	Hand Impact	E-com	Sparks
Flame	Heat	Rain	Wear	Washable	Ergonomics	Durability	Recycled	Steel Toecap
PU/PU	Composite Toecap	Fibreglass Toecap	Flyknit	Thermo plastic Toecap	Microfibre	Wide Toecap	PU	PU/Rubber
Impact Resistant	Energy Absorbent	Anti Static	Puncture Resistant	Oil Resistant	Slip Resistant	Hydrocarbon Resistant	Ladder Grip	Food Grade



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