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BUREAU OF INDIAN STANDARDS

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Draft Indian Standard

GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR PROTECTION OF ARMS AND HANDS

(First Revision)

(ICS 13.340.10)

Occupational Safety and Health Sectional Committee, CHD 08	**Last Date for Comments** : **02 May 2024**

Occupational Safety and Health Sectional Committee, CHD 08

FOREWORD

(*Formal Clause shall be added later*)

This standard is intended to guide workers and those in charge of their safety in industrial operations in selecting· such protective equipment for hands and arms that will give the required protection against hazards likely to be encountered.

This standard was first published in 1978. In this first revision, the following modifications have been incorporated.

a) Classification of hazards and selection of equipment related to protection of arms and hands have been updated.
b) Clauses on the following topics have been added:
    i) When to use protective gloves
    ii) Training, procedures, and written program; and
    iii) Proper use.
c) References have been updated and other editorial changes have been done to bring the standard in latest style and format of Indian Standards.

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GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR PROTECTION OF ARMS AND HANDS

(First Revision)

1 SCOPE

This standard describes the various types of safety equipment for hand and arm protection. It helps to understand the hazards and offers a selection guide to select the right equipment for application for which the protection is required.

The standards address proper use of gloves, sizing, cleaning, disinfection, decontamination, inspection and storage.

2 REFERENCES

The Indian standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Indian standard are encouraged to investigate the possibility of applying the most recent editions of the standards.

3 CLASSIFICATION OF HAZARDS RELATED TO PROTECTION OF ARMS AND HANDS

Hazards against which arms and hands protection equipment is used are given in Table 1 address the hazard, potential damage, material of construction selection criteria and relevant Indian standards.

Table 1 Hazards Related to Protection of Arms and Hands

(*Clauses* 3, *and* 5)

Hazard Code no.	Hazard category	Hazard Description	Typical application	Potential Damage	Typical material of constructions	Selection Criteria (Conditions to consider	Relevant Indian Standard
H1	Heat	Heat, but where no irritant substance present and the risk of wear is not serious	Furnace work drop stamping, casting and forging, handling hot tyres and similar operations	Temperature Burns,	Para aramid Heat resistant fibers Aluminized Fabric	Dexterity Size Temperature to be handled Fire-resistant capacity grip Duration of exposure	IS 16874
H2	Heat	Heat, when irritant substance is present and risk of wear is Serious	Stoking gas retorts, riveting, holding up, hot chipping	Temperature Burns, molten splash,	Para aramid Heat resistant fibers Aluminized Fabric	Dexterity Size Temperature to be handled Fire-resistant capacity grip Duration of exposure	IS 16874

H3	Heat	Heat, when fair degree of sensitivity is required and splashes or spatter of molten metal may occur	Welding, case hardening in cyanide bath	Temperature Burns, molten splash, Material that isn't flame resistant melts into the skin which often can never be completely removed	Para aramid Heat resistant fibers Aluminized Fabric	Dexterity Size Temperature to be handled Fire-resistant capacity grip Duration of exposure	IS 16874 IS 2573
H4	Heat	Heat, when caused by steam	Generated in Boilers, furnace etc.	Steam burns	Para aramid Heat resistant fibers	Dexterity Size Temperature to be handled Fire-resistant capacity grip Duration of exposure	IS 16874
H5	Heat	Cryogenic	Handling Cryogenic liquids and cryogenic containers	Cold burns		Dexterity Size Grip Cryogenic temperature expected	IS 5866
H6	Cut	Sharp Materials or Objects	Sharp metal after guillotining, blanking or machining	Cuts Lacerations	Polyester, High performance Polyethylene(HPPE) Para aramid Nitrile Leather	Dexterity Size Penetration Permeability Degradation grip	IS 2573 IS 6994 (Part 9) IS 6994 (Part 10)
H7	Cut	Glass or timber with splintered Edges	Handling wooden chips ,glass moulding, glass handling, pottery	Cuts Lacerations	Polyester, High performance polyethylene(HPPE) Para aramid Nitrile Leather	Dexterity Size Penetration Permeability Degradation grip	IS 2573 IS 6994 (Part 9) IS 6994 (Part 10)
H8	Cut	Abrasions	Handling cold castings or forgings, precast concrete, bags of cement or bricks	Cuts Lacerations	Polyester, High performance polyethylene(HPPE) Para aramid Nitrile Leather	Dexterity required to perform the operation Level of abrasion expected during operation Level of cut expected Puncture Level of Damping Shock absorption capacity	IS 2573 IS 6994 (Part 9) IS 6994 (Part 10)

						Size Grip	
H9	Cut	Gross Abrasion	Shot blasting	Cuts Lacerations	Polyester, High performance polyethylene(HPPE) Para aramid Nitrile Leather	Dexterity required to perform the operation Level of abrasion expected during operation Level of cut expected Puncture Level of Damping Shock absorption capacity Size Grip	IS 2573 IS 6994 (Part 9) IS 6994 (Part 10)
H10	Cut	Light Abrasion	Light handling operations	Cuts Lacerations	Polyester, High performance polyethylene(HPPE) Para aramid Nitrile Leather	Dexterity required to perform the operation Level of abrasion expected during operation Level of cut expected Puncture Level of Damping Shock absorption capacity Size Grip	IS 2573 IS 6994 (Part 9) IS 6994 (Part 10) IS 5450
H11	Cut / Chemicals	Sharp materials or objects in alkaline degreasing bath	Electro plating ,Chemical handling	Skin Irritation, Chemical Burns, Skin Diseases & skin allergies Etching	Polyester, High performance polyethylene(HPPE) Para aramid Nitrile Leather Latex rubber Poly urethane	Dexterity Size Penetration Permeability Degradation Grip Level of abrasion expected during operation Level of cut expected	IS 2573 IS 6994 (Part 9) IS 6994 (Part 10) IS 6994 (Part 1) : 2021
H12	Mechanical	Impact	Mechanical operations like hammering, power press, using heavy duty hand tools etc.	Cuts Broken bones Finger or hand amputations		Dexterity Size Grip Level of abrasion expected during operation Level of cut expected Amount of Impact expected	IS 6994 (Part 6)
H13	Mechanical	Vibration	Mechanical operations like hammer drilling,	Cuts swelling of Tendon		Dexterity Size Grip	IS 6994 (Part 6)

			Concrete vibrators, power press.	Carpel tunnel syndrome (Numbness) Back disorders		Level of abrasion expected during operation Level of cut expected Amount of Impact expected	
H14	Chemicals	Chemicals	Handling or contact with acids, alkalis, dyes, and general chemicals, ,but not involving contact with solvents or oils	Skin Irritation, skin allergies Skin absorption of life-threatening toxins Severe chemical burns skin diseases that last for a long time	Nitrile Latex rubber Poly urethane Cotton/polyester lining	Dexterity Size Penetration Permeability Degradation grip	IS 6994 (Part 1), IS 6994 (Part 8) IS 16390
H15	Chemicals	Solvents, Oil & Grease	Handling or contact with solvents) oils or grease	Skin Irritation, Chemical Burns, Skin Diseases & skin allergies Etching	Nitrile Latex rubber Polyurethane Cotton/polyester lining	Dexterity Size Penetration Permeability Degradation grip	IS 6994 (Part 1) IS 6994 (Part 8)
H16	Chemicals	Electrolytic deposition	Plating and subsequent operations	Skin Irritation, Chemical Burns, Skin Diseases & skin allergies Etching	Nitrile Latex rubber Polyurethane Cotton/polyester lining	Dexterity Size Penetration Permeability Degradation grip	IS 6994 (Part 1)
H17	Chemicals	Hot Alkaline Cleaning Bath	Chemical Handling	Skin Irritation, Chemical Burns, Skin Diseases & skin allergies Etching	Nitrile Latex rubber Poly urethane Cotton/polyester lining	Dexterity Size Penetration Permeability Degradation grip	IS 6994 (Part 1)
H18	Chemicals	Spraying Paint or Cellulose lacquers	Painting , surface coating	Skin Irritation, Chemical Burns, Skin Diseases & skin allergies Etching	Nitrile Latex rubber Poly urethane Cotton/polyester lining	Dexterity Size Penetration Permeability Degradation grip	IS 6994 (Part 1)
H19	Chemicals	Special Hazards: lead tetraethyl; mercury and lead and other salts	Chemical Handling	Skin Irritation, Chemical Burns, Skin Diseases & skin allergies Etching	Nitrile Latex rubber Poly urethane Cotton/polyester lining	Dexterity Size Penetration Permeability Degradation grip	IS 6994 (Part 1)
H20	Radioactive	X-Ray and other Radioactive Radiations & Radioactive waste	Work on X-ray, radio isotopes, etc.		Lead	Type of Radiation Intensity of Radiation Duration of exposure grip	

H21	Electrical	Electric Shock	Electric current carrying equipment	Electric Burns	Rubber/Latex Cotton /polyester Lining	Dexterity Size Voltage ATPV (Arc Thermal Performance Value) grip	IS 13774
H22	Electrical	Electric Arc	Working on high voltage equipment	Electric Burns	Rubber/Latex Cotton /polyester Lining	Dexterity Size Voltage ATPV (Arc Thermal Performance Value) grip	IS 13774
H23	Electrical	Anti-Static	Working on low voltage electronic components	Cuts Lacerations	Polyurethane	Dexterity Size Grip Level of abrasion expected during operation Level of cut expected Level of Antistatic Charge developed	IS 13774
H24	Medical	Food Handling	Restaurants , canteens	Skin Irritation, Skin Diseases & skin allergies Etching	Rubber/Latex Poly urethane	Type of Virus / Bacteria Intensity of Virus / Bacteria Penetration Permeation Degradation grip	IS 6994 (Part 5)
H25	Medical	Micro-organisms	Working in hospitals , Chemical laboratories	Skin Irritation, Skin Diseases & skin allergies\ Etching	Nitrile Latex rubber Poly urethane PVC	Type of Virus / Bacteria Intensity of Virus / Bacteria Penetration Permeation Degradation grip	IS 6994 (Part 5) IS 4148 IS 15354 (Part 1)
H26	Medical	Solid Waste Handling	Handling garbage and waste	Skin Irritation, Skin Diseases & skin allergies Etching	Nitrile Latex rubber Poly urethane Cotton/polyester lining PVC	Type of Virus / Bacteria Intensity of Virus / Bacteria Penetration Permeation Degradation grip	IS 4148 IS 15354 (Part 1)
H27	Medical	Medical Waste Handling	Handling hospital waste	Skin Irritation, Skin Diseases & skin allergies Etching	Nitrile Latex rubber Poly urethane	Type of Virus / Bacteria Intensity of Virus / Bacteria Penetration Permeation Degradation grip	IS 4148 IS 15354 (Part 1)

4 TYPES OF PROTECTIVE EQUIPMENT FOR ARMS AND HANDS

4.1 The various types of protective equipment for arms and hands and the various hazards against which the equipment is used are given in Table 2.

Table 2 Protective Equipment for Arms and Hands and their Use

(*Clause* 4)

Code No	Type of Equipment	Recommended For Use Against Hazards	Material of Construction
E1	Cut resistant gloves	H1, H2, H3, H4, H5, H6, H7, H8, H9, H10, H11, H12, H13	Polyester, High performance polyethylene (HPPE) Para aramid Nitrile Leather Cotton Latex Polyurethanes neoprene
E2	Abrasion Resistant Gloves		
E3	Tear Resistant gloves		
E4	Gloves against protection from cuts and stabs by knives		
E5	Impact resistant gloves		
E6	Chrome leather gloves		
E7	Vibration resistant gloves		
E8	Gloves for protection while using chain saws		
E9	Chrome leather inseam mitts and one-finger mitts		
E10	Chrome leather -gauntlet		
E11	Chrome leather inseam gauntlet with canvas or leather cuffs, with or without reinforcement between thumb and forefinger		
E12	Chrome leather stapled double palm Gloves		
E13	Chrome leather inseam gauntlet with vein patches and aprons covering palm to first joint of fingers		
E14	Chrome leather inseam gauntlet with vein patches and aprons covering palm to first joint of fingers		
E15	Chrome leather back and palm inseam gloves		
E16	Chrome leather, felt lined (thumb only), mitts with canvas or leather faced palms		
E17	Chrome leather hand guards/pads		
E18	Leather elbow pads		
E19	Cotton drill gloves		
E20	Cotton drill gloves with chrome leather 'palms		
E21	Treated canvas sleeve		
E22	Chemical resistant gloves.	H14, H15, H16, H17, H18, H19	Nitrile Latex rubber Polyurethane Cotton/polyester lining Poly urethane Neoprene
E23	Natural rubber gloves		
E24	Lined polyvinyl chloride gloves and gauntlet		
E25	Unlined polyvinyl chloride gloves and gauntlet		
E26	Unlined light weight rubber gloves and gauntlet		
E27	Unlined medium weight rubber gloves and gauntlet		
E28	Unlined heavy weight rubber gloves and gauntlet		
E29	PVC sleeve		
E30	Rubber sleeve		
E31	Rubber elbow pads		
E32	Lined light weight rubber gloves and gauntlet		
E33	Lined medium weight rubber gloves and gauntlet		
E34	Lined heavy weight rubber gloves and gauntlet		
E35	Surgical gloves	H24, H25, H26, H27	Nitrile

E36	Post mortem gloves		Latex rubber Neoprene Polyurethane Cotton/polyester lining PVC
E37	Gloves for Protection against Microorganisms.		
E38	Gloves for protection from pesticides		
E39	Electrical Resistant Gloves	H21, H22, H23	Rubber/Latex Cotton /polyester Lining Poly urethane
E40	Arc Flash Resistant Gloves		
E41	Heat Resistant Gloves	H1, H2, H3, H4, H5	Para aramid Heat resistant fibers Aluminized Fabric
E42	Flame resistant Gloves		
E43	Asbestos gloves and gauntlet		
E44	Asbestos gloves and gauntlets reinforced with -leather		
E45	Asbestos sleeve		
E46	Aluminized fabric gauntlets		
E47	Cold protection gloves		
E48	Cryogenic gloves		
E49	Lead rubber gauntlets	H20	Lead
E50	Lead plastics gauntlets		
E51	Lead leather gauntlets		

4.2 The physical characteristics of protective material used in the manufacture of gloves are demonstrated in Table 3.

Table 3 Physical Characteristics of Protective Materials of Gloves

(*Clause* 4.2)

Sl. No.	**Material (designation in matrices)**	**Abrasion resistance**	**Cut resistance**	**Flexibility**	**Heat resistance**	**Ozone resistance**	**Puncture resistance**	**Tear resistance**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i)	Butyl rubber	F	G	G	E	E	G	G
ii)	Chlorinated polyethylene	E	G	G	G	E	G	G
iii)	Natural rubber	E	E	E	F	P	E	E
iv)	Neoprene	E	E	G	G	E	G	G
v)	Nitrile-butadiene rubber	E	E	E	G	F	E	G
vi)	Nitrile rubber	E	E	E	G	F	E	G
vii)	Nitrile rubber + PVC	G	G	G	F	E	G	G
viii)	Polyethylene	F	F	G	F	F	P	F
ix)	Polyurethane	E	G	E	G	G	G	G
x)	PVA	F	F	P	G	E	F	G
xi)	PVC	G	P	F	P	E	G	G

xii)	Styrene–butadiene rubber	E	G	G	G	F	F	F
xiii)	Non-woven breathable fabric resistant to abrasion and bacterial penetration.	P	P	E	P	G	G	E

Ratings are subject to variation depending on formulation, thickness, and whether the material is supported by fabric.

E—excellent; G—good; F—fair; P—poor

5 WHEN TO USE PROTECTIVE GLOVES

Protective gloves should be used in the following situations:

a) To prevent potential exposure to Physical, mechanical, electrical, chemical and Biological hazards. Examples of Industrial Hazards which present potential health hazards are mentioned in Table 1.

b) To augment engineering and administrative controls (for example, protection from sharp edges, mechanical impacts, vibration, chemical exposure , contaminated equipment, and hazardous waste handling)

c) For extra safety with chemicals that are hazardous on contact (for example, agents that are corrosive or toxic to the skin or eyes)

d) To prevent contamination of other areas on-site and off-site from contaminants resulting from job tasks (for example, hazardous waste or Municipal waste management)

e) For emergency response and spill cleanup.

6 FACTORS TO CONSIDER WHEN SELECTING PROTECTIVE GLOVES

6.1 Dexterity

Select unsupported (unlined) gloves for extra dexterity and sense of touch. If cut, snag, puncture, or abrasion-resistance is important, match the application's critical factors to the glove's physical characteristics whether supported or unsupported

6.2 Grip

6.2.1 Select a grip pattern that provides grip needed for the job. Common patterns are;

a) Diamond embossed,

b) Pebble,

c) Patterned,

d) Dipped, or

e) Smooth

6.2.2 Not all single material of construction offers adequate protection against all chemical, Physical, mechanical and biological hazards; therefore, Protective gloves shall be selected from material that offers sufficient Hazard resistance for each situation.

6.2.3 For Chemicals the proper selection of materials involves considering how the chemical might permeate, penetrate, and degrade the gloves.

6.3 Break Through

6.3.1 The time it takes for the glove to break down and for chemicals to seep through. Ensure that the glove's permeation and degradation levels match the application. Permeation testing is conducted at 74 degrees Fahrenheit (24 ^{0}C) and with each 18 degrees Fahrenheit temperature increase, the permeation rate roughly doubles and breakthrough time significantly decreases

6.3.2 *Factors Affecting Break Through Time*

a) Ageing
b) Flexing and stretching
c) Poor maintenance
d) Mechanical damage
e) Abrasion
f) High temperature

6.3.3 Chemical permeation of protective gloves leading to breakthrough is dependent on the glove material, the chemical and its physical properties, and environmental factors (for example. humidity, temperature, and pressure). Some chemicals break through some materials almost instantaneously. The protective characteristics of any Protective gloves must be matched to the hazard.

6.4 Sizing

a) Select glove length by the depth to which the arm will be immersed or exposed to chemical splash.
b) Correct size will ensure optimum wear comfort, dexterity, and employee satisfaction.

6.5 Cut Resistance, Impact Resistance and Shock Resistance

6.5.1 To avoid cuts due to sharp objects in different industrial application, it is necessary to assess the intensity of the cut hazard and then a glove should be selected produced from materials that are resistant to the cut intensity. For example for high risks of cut an inner lining of HPPE or a glove made from Para aramids may be selected. Nitrile suitable for oil resistance and avoids slippage during handling of material with oil on its surface.

6.5.2 Shock absorbing material on fingers should be selected for industrial hazards of Impact on hands.

6.5.3 Anti-Vibration material should be selected in activities involving vibrations.

6.6 Electrical Resistance

The electric current varies in intensity in different applications, for example workers may be working on 220 volts or on a 33 kva line. The material of the gloves should be able to offer dielectric strength to handle the current the user is exposed to.

6.7 Heat Resistance

a) For extremely hot conditions, the glove material should be able to withstand extreme heat for example use of Para aramid.
b) For extreme cold conditions such as cryogenic temperatures, proper insulated glove shall be used. The insulation should withstand the low temperatures.

6.8 Proper Fit, Sizing and Wearer Comfort

Proper sizing is important for optimum use and protection. Gloves that are too large or with reduced dexterity may interfere with delicate work, and variety of sizes should be available from which wearers can select. The best approach to wearer comfort is to have personnel try several different sizes, materials, and products to determine their acceptability to the wearer and the adequacy of their protection.

6.9 Some Other Factors for Chemical Protective Gloves

6.9.1 *Breakthrough, Permeation, and Penetration Resistance to the Chemical(s).*

6.9.1.1 Characteristics are measured by breakthrough times and permeation rates of chemicals. Table 4 shows a number of common glove protection material types and protection recommendations.

Table 4 Common Protective Materials for Gloves and Protection Recommendations

(*Clause* 6.9.1)

Sl. No.	Protective material	Generally recommended for:	Not recommended for:

(1)	(2)	(3)	(4)
i)	Natural rubber	Coating on gloves for protection against Alcohols, caustics, ketones, many acids	Aromatics, hydrocarbons, many solvents (especially chlorinated or aromatic). Users having latex allergy
ii)	Nitrile-butadiene rubber	Coating on gloves for protection against Many acids, alcohols, caustics, hydrocarbons	Ketones, chlorinated hydrocarbons, strong acids
iii)	Neoprene	Coating on gloves for protection against Organic acids, caustics, alcohols, petroleum solvents, ketones ,oil and grease	Aromatic and chlorinated solvents
iv)	PVC	Coating on gloves for protection against Alcohols, caustics, hydrocarbons	Aromatic and chlorinated solvents, aldehydes
v)	Butyl rubber	Coating on gloves for protection against Acids, ketones, esters, bases, alcohols, aldehydes	Hydrocarbons and halogenated or aromatic hydrocarbons
vi)	Poly urethane	Handling food and for anti-static application	
vii)	Cotton	Lining in gloves for additional comfort	Cut resistance
viii)	Polyester	Lining in gloves for cut resistance	Heavy cut resistance
ix)	Para Aramid	For high cut resistance and heat resistance	
x)	HPPE	Lining in gloves for high Cut resistance	
xi)	Leather	For high abrasion resistance	
This table is a reference guideline and should be used only after consultation with Qualified Safety Professionals or Industrial hygienist.			

6.9.1.2 The only way to be sure about the performance of a material is to avail test claims or technical data of the protective gloves lining and coating against the Physical, chemical or biological hazards shall be obtained from the manufacturer before selection of the glove material.

6.9.1.3 Environmental temperature and pressure effects may enhance permeation and reduce the breakthrough time for chemical protective clothing. Chemical mixtures can also complicate the selection process; and so the most hazardous component of the mixture should be determined. Permeation can occur without any visible changes in the protective materials.

6.9.2 Type and duration of exposure.

Typical categories of exposure are immersion, splash, spray, mist, vapor, and surface contact. When a task includes immersion in a chemical, a more-protective glove should be used than for a task where contact is limited to an accidental splash. Wear time shall not exceed breakthrough time unless the permeation rate or type of exposure is insignificant.

6.9.3 List of Common Industrial Chemicals

List of common industrial chemicals

a) Methanol
b) Acetone

c) Aceto nitrile
d) Dichloromethane
e) Carbon Disulfide
f) Toluene
g) Diethylamine
h) Tetra hydrafurane
j) EthlAcetate
k) n-Heptane
m) Sodium Hydroxide 40%
n) Sulphuric Acid 96%
p) Nitric Acid 65%
q) Acetic Acid 99%
r) Ammonium Hydroxide 25%
s) Hydrogen Per Oxide 30 %
t) Hydrofluoric Acid 40%
u) Formaldehyde 37%

6.10 Other considerations, such as

a) The ability of the gloves to withstand repetitive exposure & address multiple hazards.

b) Shelf life and special storage conditions (for example, avoiding sunlight, ozone, or moisture). A long shelf life is not the same as a high chemical resistance. Different components of a protective garment may have different shelf lives.

c) The ability of a gloves to be cleaned and decontaminated, if it is to be reused.

6.11 After evaluating all of the factors above, the type of material best suited for the intended use and the proper apparel ensemble can be determined.

7 TRAINING, PROCEDURES, AND WRITTEN PROGRAM

7.1 Training must be provided to help ensure that all employees who use Protective gloves have a full understanding of the specific Protective gloves required when performing specific tasks; and the proper use, maintenance, and storage. Training shall be done prior to the first use .Periodic refresher training should be done annually or as a result of the Management of Change of operations where the protective gloves is being used.

7.2 The following topics should be included in training:

a) Workplace hazards and locations where protective gloves is used

b) Type of protective gloves specified (for example, gloves and material of construction)

c) Pre-use inspection of the protective gloves for defects

d) How to properly select right size , adjust, wear, and remove the protective gloves

e) Limitations of protective gloves

f) How to recognize and manage protective gloves failure

g) Proper protective gloves care, including decontamination, cleaning, storage, maintenance, and disposal

8 PROPER USE

Protective gloves must be worn for each required task and must be worn properly. Protective gloves must not be tampered with or modified in any manner that adversely affects the proper functioning of the gloves. It shall be used and maintained in sanitary and reliable condition. Protective gloves that is damaged or defective shall not be used.

8.1 Wearing the Gloves

a) The user shall inspect the gloves immediately before wearing. The gloves should be donned according to the manufacturer's instructions.
b) A glove should be free of hazardous chemicals before it is removed. After decontaminating, gloves must be removed carefully. External areas must not be touched with unprotected body parts. The wearer can reach inside the glove cuff to avoid touching contaminated areas. Hands must be washed after removing the gloves.

8.2 Decontaminating, Cleaning, Inspecting, Repairing, and Storing Protective Gloves

Gloves must be decontaminated, cleaned, inspected, repaired (or discarded, as appropriate), and properly stored between uses. It shall be used and maintained in sanitary and reliable condition. Gloves that are damaged or defective shall be repaired before use or discarded. Personnel who use gloves and their supervisors should help ensure that it is maintained and used properly.

8.2.1 *Decontamination*

a) Gloves must be thoroughly decontaminated or discarded after it is used. The toxicity of the chemical against which the gloves were used may influence the decision to decontaminate or discard. If it is difficult to remove the material and trace quantities can cause health problems, gross contamination should be removed from the gloves and it should be discarded. The effectiveness of decontamination is also affected by the nature of the glove's material of construction.
b) Initial decontamination of gloves usually consists of a wash. The waste water must flow to a wastewater treatment system. The gloves may be scrubbed with a soft brush and detergent followed by flushing under a safety shower.
c) Soap and water are effective in removing water-soluble contaminants. Water-insoluble organic contaminants may be Decontaminated with solvents .however it may adversely affect the gloves permeation properties.

8.2.2 *Cleaning*

a) Gloves that are reused shall be kept clean and rinsed off after use (except for polyvinyl alcohol [PVA], which is damaged by water. Manufacturer's cleaning instructions must be followed. The person who cleans the gloves must be made aware of the contamination risk and must be protected.
b) Employees shall not take gloves that has been used for protection against hazardous materials home for cleaning.

8.2.3 *Inspection*

Gloves shall be inspected visually for cuts, tears, contamination, and evidence of degradation (for example, cuts, stiffness, softness, swelling, or discoloration). Manufacturer or vendor information and directions relative to testing and inspection should be reviewed and followed as appropriate.

8.2.4 *Prior to Use*

The gloves shall be visually inspected prior to use. They shall not be used if evidence of chemical or physical damage or contamination is found. Contaminated gloves should be cleaned or properly discarded.

8.2.5 *Periodic Inspection and Testing*

Gloves shall be inspected and tested periodically. If service is severe, then inspection and testing after every use may be appropriate.

8.2.6 *Storage, Use and disposal*

a) Gloves shall be stored properly to prevent damage from dust, moisture, sunlight, chemical exposure, temperature extremes, impact, and friction. They shall not be stored with tools. Clean gloves should be segregated from dirty ones. They should be stored in lockers assigned to individuals.

b) Gloves must not be tampered with or modified in any manner that adversely affects its proper functioning. It shall be used and maintained in sanitary and reliable condition. Gloves that are damaged or defective shall not be used.

c) Gloves that cannot be decontaminated (for example, disposable or single use gloves) must be discarded appropriately. They shall be properly discarded with adherence to local state specific PCB (Pollution control board) norms.

ANNEX A
(*Foreword*)
LIST OF REFEREED INDIAN STANDARDS

IS No.	*Title*
IS 2573 : 2023	Leather gauntlets and mittens — Specification
IS 4148 : 1989	Surgical rubber gloves — Specification (*first revision*)
IS 5450 : 2023	Textiles gloves wool knitted — Specification
IS 5866 : 1979	Specification for chrome leather for high altitude gloves (*first revision*)
IS 6994 (Part 1) : 2021 ISO 374-1 : 2016	Protection of Arms and Hands Part 1 Protective Gloves against Dangerous Chemicals and Micro-organisms-Terminology and performance requirements for chemical risks (*first revision*)
IS 6994 (Part 5) : 2021	Protection of Arms and Hands Part 5 Protective Gloves against Dangerous Chemicals and Micro-organisms - Terminology and performance requirements for micro-organisms risks
IS 6994 (Part 6) : 2021 ISO 23388 : 2018	Protection of Arms and Hands Part 6 Protective gloves against mechanical risks
IS 6994 (Part 8) : 2021 ISO 18889 : 2019	Protection of Arms and Hands Part 8 Protective Gloves for Pesticide Operators and Re-entry Workers — Performance Requirements
IS 6994 (Part 9) : 2021	Protection of Arms and Hands Part 9 Protective clothing - Gloves and arm guards protecting against cuts and stabs by hand knives — Chain-mail gloves and arm guards
IS 6994 (Part 10) : 2021 ISO 13999-2 : 2003	Protection of Arms and Hands Part 10 Protective clothing- Gloves and arm guards protecting against cuts and stabs by hand knives - Gloves and arm guards made of material other than chain mail
IS 13774 : 2021 IEC 60903 : 2014	Live Working Gloves of Insulating Material *(Second Revision*)
IS 15354 (Part 1) : 2023 ISO 11193-1:2020	Single-use medical examination gloves Part 1 Specification for gloves made from rubber latex or rubber solution (*second revision*)
IS 16390 : 2015	Agro textiles - Nylon knitted seamless gloves for tobacco harvesters — Specification
IS 16874 : 2018	Textiles — Protective gloves for firefighters - Specification