



Lab Glove Selection Guide

Table of Contents

Minimizing Contact Risk.....1

Glove Selection Guide.....4

How We Select Gloves8

 Chemical Contact Hazard Ranking8

 Glove Performance Rating8

 Glove Protection Level.....9

The Lab Glove Selection Guide helps you choose gloves to protect your skin from chemical contact hazards. Use this guide along with agent- or process-specific standard operating procedures.

This guide addresses glove chemical protection and doesn't consider other performance factors like puncture resistance and thermal or cut protection. Consider appropriate contact protection for other skin areas when choosing gloves.

Our glove selection is based on available product performance data reviewed by EH&S. Other gloves that provide adequate protection are available.

Minimizing Contact Risk

In addition to choosing the right gloves, follow practices to minimize your hand- and hazardous chemical-contact risks when working in labs.

- Always use techniques that minimize contact and splashing.
- Monitor the condition of your gloves (especially disposable gloves) and change your gloves if they are damaged or contaminated with high contact hazard materials.



- Change disposable gloves often and wash your hands when you remove your gloves.
- Consider double gloving in situations where practical considerations may limit the best glove selection.
- Reusable gloves provide better forearm protection and puncture resistance and are the most appropriate [very high or high contact hazard chemical](#) contact protection.

Reusable gloves are recommended for all work requiring [immersion protection](#).

- Be aware of conditions that may affect your contact hazards risk and adjust your protection as needed:

Skin health: Abrasions and open wounds may allow increased absorption of chemicals.

Chemical temperature: Heated chemicals may permeate faster.

Solvent transport: Solvents with low or medium contact hazards such as DMSO and chloroform may transport higher hazard chemicals.

EH&S continually updates our chemical and [glove selection](#). Selected gloves are available in each campus' VWR stockrooms.

Glove Selection Guide Key

Each chemical has a color-coded contact hazard ranking.

Contact hazard rankings are based on chemical hazard properties. Learn [how we determine chemical contact hazard rankings](#).

Contact Hazard Ranking
Low
Medium
High
Very High

Disposable Glove Types

Glove types include their glove protection level (based on the type of contact with chemicals) and other constraints like tested breakthrough time.



Disposable Glove Type	Material	Thickness
Ansell Microflex 93-260	Nitrile and neoprene	7.9 mils
Ansell TouchNTuff 92-60	Nitrile	4.9-5.5 mils
Showa 8005	Nitrile	8 mils

Glove Protection Levels

Symbol	Description
S	Splash
C	Intermittent contact
I	Immersion

Glove Protection Constraints

Symbol	Description
Digits	Breakthrough time in minutes
NR	Not recommended
ND	No permeation data available

Example

Chemical: Acetic acid (99%w/w) {anhydrous, glacial}: Chemical name

Contact Hazard Ranking: High: This chemical poses a high hazard from any contact.

CAS: 64-19-7: Chemical Abstracts Service (CAS) registry number. CAS numbers uniquely identify each chemical (despite nomenclature or synonyms).

Ansell Microflex 93-260: S-30: These gloves provide 30 minutes of protection for activities that may involve splashing but that don't involve intermittent contact with or immersion in that chemical.

Showa 8005: ND: This chemical doesn't have glove permeation data available.

Ansell TouchNTuff 92-60: NR: These gloves aren't recommended for use with that chemical.



Glove Selection Guide

Chemical ¹	Contact Hazard Ranking	CAS	Ansell Micro-flex 93-260	Showa 8005	Ansell TouchNTuff 92-60
Acetic acid (99%w/w) {anhydrous, glacial}	High	64-19-7	S-30	ND	NR
Acetone	Low	67-64-1	S-3	S-6	S-.5
Acetonitrile	Low	75-05-8	S-5	C-15	S-<5
Ammonium hydroxide (28%w/w)	High	1336-21-6	S-51	I-480	S-29
Benzene	Medium	71-43-2	S-5	S-3	ND
Butanol [n-]	Low	71-36-3	I-434	C-24	I-70
Butanol [tert-]	Low	75-65-0	ND	ND	ND
Carbon disulfide	Medium	75-15-0	S-1	ND	S-<5
Carbon tetrachloride	Medium	56-23-5	C-39	C-24	
Chlorobenzene	Low	108-90-7	ND	S-6	ND
Chloroform	Medium	67-66-3	S-2	ND	S-.3
Cresols	Medium	1319-77-3	ND	ND	ND
Cyclohexane	Low	110-82-7	ND	I-240	I-480
Cyclohexanol	Medium	108-93-0	I-480	I-275	ND
Cyclohexanone	Medium	108-94-1	S-9	ND	S-<5
Decahydronaphthalene {decalin}	High	91-17-8	ND	ND	ND
Dichlorobenzene [o-]	Low	95-50-1	ND	ND	ND

¹ With contact hazard ranking color code.



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Chemical ¹	Contact Hazard Ranking	CAS	Ansell Micro-flex 93-260	Showa 8005	Ansell TouchNTuff 92-60
Dichloroethane [1,1-]	Low	75-34-3	ND	ND	ND
Dichloromethane	Low	75-09-2	S-1	S-4	S-<5
Diethylamine	High	109-89-7	NR	S-10	NR
Dimethoxyethane [1,2-] {glyme}	Medium	110-71-4	ND	ND	ND
Dimethyl sulfoxide (DMSO)	Low	67-68-5	I-93	I-480	S-5
Dimethylformamide [N,N-] {DMF}	Medium	68-12-2	S-9	ND	S-<5
Dioxane [1,4-]	Medium	123-91-1	ND	C-14	ND
EG monomethyl ether {methyl cellosolve}	Medium	109-86-4	ND	S-9	ND
Ethanol	Low	64-17-5	I-66	I-240	S-8
Ethanol (70%w/w)	Low	64-17-5	ND	ND	C-27
Ethyl acetate	Low	141-78-6	S-5	C-14	S-1
Ethyl ether	Low	60-29-7	ND	S-3	S-.4
Ethylene glycol ether	Medium	110-80-5	ND	S-9	ND
Formalin (37 % w/w)	High	50-00-0	I-480	I-480	I-480
Formic Acid	High	64-18-6	S-20	ND	ND
Formic Acid (90% w/w)	High	64-18-6	ND	S-30	ND
Hexamethylphosphoramide {HMPA}	Medium	680-31-9	ND	ND	ND
Hexane [n-]	Medium	110-54-3	I-280	I-85	I-480
Hydrobromic Acid (49%w/w)	High	10035-10-6	ND	ND	I-480



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Chemical ¹	Contact Hazard Ranking	CAS	Ansell Micro-flex 93-260	Showa 8005	Ansell TouchNTuff 92-60
Hydrochloric acid (36%w/w)	High	7647-01-0	I-480	I-480	S-51
Hydrofluoric Acid (10% w/w)	High	7664-39-3	ND	ND	S-13
Hydrofluoric acid (48% w/w)	Very High	7664-39-3	ND	S-50	NR
Hydrogen peroxide (30%w/w)	Low	7722-84-1	I-480	I-480	C-41
Isoamyl acetate	Low	123-92-2	ND	S-7	ND
Isobutanol	Low	78-83-1	ND	I-70	ND
Isobutyl acetate	Low	110-19-0	ND	ND	ND
Isopropanol	Low	67-63-0	I-204	I-240	I-117
Methanol	Medium	67-56-1	C-21	C-13	S-1
Methoxymethyl ether [bis(2-)] {diglyme}	Low	111-96-6	ND	ND	ND
Methyl acetate	Low	79-20-9	ND	S-3	ND
Nitric acid (23%w/w)	High	7697-37-2	ND	I-480	ND
Nitric acid (50%w/w)	High	7697-37-2	ND	ND	S-9
Nitric acid (65%w/w)	High	7697-37-2	S-30	ND	ND
Nitric acid (70%w/w)	High	7697-37-2	ND	ND	NR
Nitrobenzene	Medium	98-95-3	ND	S-9	ND
Nitromethane	Low	75-52-5	ND	S-5	ND
Pentane [n-]	Low	109-66-0	ND	C-59	ND
Perchloric acid (70%w/w)	High	7601-90-3	ND	ND	ND



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Chemical ¹	Contact Hazard Ranking	CAS	Ansell Micro-flex 93-260	Showa 8005	Ansell TouchNTuff 92-60
Petroleum ether	Low	8032-32-4	ND	I-240	ND
Phenol	High	108-95-2	ND	S-10	ND
Phenol chloroform (25;24:1)	High	NA	ND	ND	ND
Phosphoric acid (85% w/w)	High	7664-38-2	I-480	I-480	ND
Potassium hydroxide (45% w/w)	High	1310-58-3	ND	I-480	ND
Pyridine	Low	110-86-1	ND	ND	ND
Sodium hydroxide (40-50%w/w)	High	1310-73-2	I-480	I-480	I-480
Styrene	Low	100-42-5	ND	S-6	ND
Sulfuric acid (96%w/w)	High	7664-93-6	S-49	ND	NR
Tetrahydrofuran	Medium	109-99-9	S-2	ND	S- <5
Thionyl chloride	High	7719-07-9	ND	ND	ND
Toluene	Low	108-88-3	S-6	ND	S-1
Triethylamine	High	121-44-8	I-342	ND	C-155
Trimethylbenzene [1,3,5-] {mesitylene}	Low	108-67-8	ND	ND	ND
Trimethylpentane [2,2,4-] {isooctane}	Low	540-84-1	ND	ND	ND
Xylene mixture	Low	1330-20-7	C-11	C-11	S-<5



How We Select Gloves

Chemical Contact Hazard Ranking

We consider acute toxicity, direct skin effects, and systemic effects from skin absorption when assigning chemical contact hazard rankings.

Only contact hazards need to be considered when selecting gloves for chemical protection, even for chemicals that have health or physical hazards which must be controlled by other methods.

Safety data sheets² help determine acute toxicity and direct skin effects, but we may need other sources to evaluate the significance of systemic effects and absorption.

Determination Process Summary

Contact Hazard Ranking	Hazard Properties	GHS Hazard Statement Examples
Low	No skin hazards Skin irritation Cannot move through the skin	Causes skin irritation
Medium	Moderate acute toxicity or serious chronic effects Can move through the skin	Toxic in contact with the skin May cause cancer
High	Cause immediate damage to skin	Causes severe skin burns
Very High	High acute toxicity Can move through the skin	Fatal if contact with the skin

Glove Performance Rating

² In the current globally harmonized system GHS format



Glove performance ratings are based primarily on the glove material’s breakthrough time.

Breakthrough time is how long it takes for a chemical to migrate from the glove’s outside surfaces to its inside surfaces, thereby contacting the skin.

Glove Performance Rating	Breakthrough Time in Minutes
Excellent	Greater than 240
Good	60 to 240
Fair	10 to 60
Poor	Less than 10

Breakthrough times are usually determined under conditions of constant contact under pressure and may underestimate performance in labs. Manufacturer-provided breakthrough times based on intermittent contact testing are used when available.

EH&S reviews the readily available permeation data for all Glove Selection Guide gloves.

Glove Protection Level

Glove protection levels consider the likelihood and estimated amount of chemical contact on gloves. The chemical amounts you use and how you manipulate them define the glove protection level.

Glove Protection Level	Procedures and Situations
Splash (S)	Procedures that only require contact with containers and not their contents but risk small-scale contamination due to splashing. The splash risk increases when using and decanting larger amounts and containers.
Intermittent Contact (C)	Procedures where occasional short-term contact (one minute to five minutes) of gloves with chemicals or wetted parts may occur, like acid etching or cleaning procedures. Situations where splashing is more likely, like spraying or working with boiling solvents.



Glove Protection Level	Procedures and Situations
Full Immersion (I)	Procedures that require either periods of extended glove immersion or frequent intermittent contact over an extended period. Full immersion protection is more commonly associated with industrial rather than lab settings.

Chemical Contact Hazard Matrix

The Chemical Contact Hazard Matrix helps you determine glove protection levels. Find the maximum protection level by using the appropriate glove performance rating and chemical contact hazard ranking.

Glove Performance Rating	Low	Medium	High	Very High
Poor	Splash	Splash	N/A	N/A
Fair	Splash/contact	Splash/contact	Splash	N/A
Good	Splash/contact/ immersion	Splash/contact/ immersion	Splash/contact	Splash/contact
Excellent	Splash/contact/ immersion	Splash/contact/ immersion	Splash/contact/ immersion	Splash/contact/ immersion