

# KLEENGUARD\* Brand Gloves

## Chemical Resistance Guide



## Choosing the Right KLEENGUARD\* Chemical Resistant Glove for the Job

This guide presents the results of ASTM F739 standard permeation testing and degradation ratings for Kimberly-Clark's family of KLEENGUARD\* Chemical Resistant Gloves. It is intended as a tool to help you assess which glove is best suited for working with specific chemicals.

This guide is not designed to consider every possible factor or circumstance relative to safety in every environment. To select the appropriate glove protection, a Hazards Analysis and Risk Assessment should be performed, including identification of the chemicals and chemical hazards related to the worker's task and work environment; determination of the potential for exposure and the type of exposure that is expected (i.e. splash, saturation, spray, immersion, etc.); and determination of the consequences related to exposure.

It is the responsibility of the user to assess the types of hazards and the risks associated with exposure and to make a final decision on the appropriate personal protective equipment needed for his specific circumstance.

### Understanding Testing Terminology

**Permeation:** This is a process by which a chemical can breach a surface in which no perceptible openings are present. In permeation, the chemical's molecules actually slip between the molecules of the glove material and are detected. The results of the permeation process are undetectable by the naked eye.

**Breakthrough Time:** Measured in minutes, this is the amount of time between the initiation of the permeation test and analytical detection of the chemical on the reverse side of the sample material. Breakthrough times give an indication of how long a glove, that's totally immersed in the test chemical, can provide resistance to chemical permeation.

**Permeation Rate:** The maximum rate at which a permeating chemical passes through the fabric as measured by the analyzer. It is reported as micrograms per square centimeter of fabric per minute.

**Note:** The combination of breakthrough time and permeation rate should be taken into consideration when making a glove selection. The goal is to provide the wearer with the least possible amount of chemical exposure for the duration of the task. Therefore, a long breakthrough time and a low permeation rate results in less chemical exposure over time — compared to a shorter breakthrough time and a higher permeation rate.

**Degradation:** This is the measurement of changes in the physical properties of a glove material, after contact with a chemical. The changes may include a stiffening of the material, becoming hard or brittle; or the glove material may swell and become softer and weaker.

# How to Utilize this Chemical Resistance Guide

Three categories of data are provided for each product and corresponding chemical:

- 1) Permeation *breakthrough time*;
- 2) Permeation *rate*, and
- 3) *Degradation* resistance rating.

## Color Code Rating System

A glove/chemical combination receives a **GREEN** rating if either Condition A or B is met.

### Condition A

- The permeation breakthrough time is 240 minutes or longer.
- The permeation rate is not specified.
- The degradation rating is Excellent or Good.  
*OR*

### Condition B

- The permeation breakthrough time is 30 minutes or longer.
- The permeation rate is Excellent or Good.
- The degradation rating is Excellent or Good.

A glove/chemical combination receives **RED** if: the degradation rating is Not Recommended, regardless of the permeation time or rate; or if the breakthrough time is less than 30 minutes and the degradation rating is poor.

Any glove/chemical combination not meeting either set of conditions required for **GREEN** or **RED** receives a **YELLOW**, or cautionary rating.

## Criteria for Chemical Resistance Guide

### Permeation Breakthrough Time (PB)

Rating	Minutes
Excellent	> 240
Good	> 30
Poor	≥ 10
Not Rated	< 10

### Permeation Rate (PR)

Rating	µg/cm <sup>2</sup> /min
Excellent	< 1
Good	< 100
Poor	< 10,000

### Degradation (D)

Rating	Key
Excellent (E)	Excellent; fluid has very little degrading effect.
Good (G)	Good; fluid has minor degrading effect.
Poor (P)	Poor; fluid has pronounced degrading effect.
Not Recommended (NR)	NR – Fluid was not tested against this material or the fluid has excessive degrading effects.

## GREEN

The results for this specific chemical suggest that the glove would provide adequate barrier for use in most applications.

## RED







Not recommended for use.

## YELLOW

The results require additional consideration by a safety professional to determine suitability for use.

For additional information on choosing the right chemical glove for your application, please visit our Chemical Resistance Database at: <http://www.kcprofessional.com/us/mkt/ChemicalSelectorGuide/>

## Glove Comparison Chart of KLEENGUARD\* G80 Chemical Resistant Gloves

KLEENGUARD* Brand Glove Chemical Resistance Guide						
	 G80 Purple Nitrile	 G80 Neoprene/Latex	 G80 PVC	 G80 Purple Nitrile	 G80 Neoprene/Latex	 G80 PVC
Acetaldehyde						
Acetic Acid						
Acetonitrile						
Aluminum Sulfate						
Ammonia						
Ammonia Household Cleaner						
Ammonium Hydroxide						
Ammonium Nitrate (fertilizer)						
Aniline						
Boric Acid						
Brake Fluid						
Bromopropionic Acid						
1, 3 Butadiene						
Butyl Carbitol						
Carbon Disulfide						
Carbon Tetrachloride						
Chloracetone						
Chlorine Gas						
Chromic Acid						
Citric Acid						
Cumene						
Cutting Oil						
Cyclohexane						
Diesel Fuel, mixture						
Diethyl Ether						
Dimethylformamide (DMF)						
Dioctyl Phthalate						
Ethyl Alcohol						
Ethylbenzene						
Ethylene Dichloride						
Ethylene Glycol						
Ethylene Oxide						
Fertilizer						
Formaldehyde						
Formic Acid						
Fuel Oil						
Furniture Polish						
Gasoline (unleaded)						
Glutaraldehyde						
Gunk Cutting Oil						
Heptane						
Herbicide						
n-Hexane						
Hydraulic Brake Fluid						
Hydrochloric Acid						
Hydrofluoric Acid						
Hydrogen Peroxide						
Isobutylene						
Isopropyl Alcohol						
Jet Fuel						
Linseed Oil						
Lubricant						
Methanol						
Methyl Ethyl Ketone						
Methyl Formate						
Methyl Sulfoxide						
Methyl Tert Butyl Ether						
4,4-Methylene Bisphenyl Isocyanate						
Mineral Spirits						
Motor Oil						
Muriatic Acid						
n-Methyl-2-Pyrrolidinone						
Nitric Acid						
Nitrobenzene						
Oleic Acid						
Oleum						
Perchloroethylene						
Phenol						
Phosphoric Acid						
Pine Oil Soap						
Polyurethane						
Potash (KOH)						
Potassium Hydroxide						
Rust Remover						
Sodium Hydroxide						
Sodium Hypochlorite						
Sulfuric Acid, 47%						
Sulfuric Acid, 95% ≥						
1, 1, 1, Tetrachloroethylene						
Toluene						
Trichloroethane						
Turpentine						
Vinyl Acetate						
Water Sealant, clear						
Weed Killer						
Window Cleaner						
Wood Finish						
Xylene						

### Conditions/Color Codes

See color code chart on next page

# KLEENGUARD\* G80 PURPLE NITRILE\* Chemical Resistant Gloves



**KLEENGUARD\* G80  
PURPLE NITRILE\*  
Chemical Resistant Glove**

	ASTM F739		Degradation (D)	Overall Rating		ASTM F739		Degradation (D)	Overall Rating
	Permeation Breakthrough Time (PB)	Permeation Breakthrough Rate (PR)				Permeation Breakthrough Time (PB)	Permeation Breakthrough Rate (PR)		
Acetonitrile	10	250	E	Green	Isopropyl Alcohol	>480	ND	E	Green
Ammonia	269	0.65	E	Green	Jet Fuel	>480	ND	E	Green
Ammonia Household Cleaner	>480	ND	E	Green	Lubricant	>480	ND	E	Green
Ammonium Nitrate (fertilizer)	>480	ND	E	Green	Methanol	36	20.78	G	Green
Brake Fluid	>480	ND	E	Green	Methyl Ethyl Ketone	Immed	5	P	Red
Butadiene 1, 3	299	0.75	E	Green	Methyl Sulfoxide	61	50.1	E	Green
Carbon Disulfide	9	26	G	Yellow	Methyl Tert Butyl Ether	235	21.30	E	Green
Carbon Tetrachloride	206	3	G	Green	4,4-Methylene Bisphenyl Isocyanate	>480	ND	E	Green
Chlorine Gas	>480	ND	E	Green	Mineral Spirits	>480	ND	E	Green
Chromic Acid	188	39.5	F	Yellow	Motor Oil	>480	ND	E	Green
Cumene	115	59.3	E	Green	Muriatic Acid	>480	ND	E	Green
Cutting Oil	>480	ND	E	Green	Nitrobenzene	91	3.21	P	Yellow
Cyclohexane	>480	ND	E	Green	Perchloroethylene	121	141	G	Green
Diesel Fuel, mixture	>480	ND	E	Green	Phenol	29	60.4	P	Yellow
Dimethylformamide (DMF)	31	89.67	P	Red	Pine Oil Soap	>480	ND	E	Green
Diocetyl Phthalate	>480	ND	E	Green	Potash (KOH)	>480	ND	E	Green
Ethylbenzene	38	21.33	G	Green	Potassium Hydroxide	>480	ND	E	Green
Ethylene Dichloride	5	10.37	G	Yellow	Rust Remover	>480	ND	E	Green
Ethylene Glycol	>480	ND	E	Green	Sodium Hypochlorite	>480	ND	E	Green
Ethylene Oxide	42	12.53	E	Green	Tetrachloroethylene	148	36	G	Green
Fertilizer	>480	ND	E	Green	Toluene	11	591	P	Red
Formaldehyde	>480	ND	E	Green	1,1,1, Trichloroethane	34	856	G	Yellow
Fuel Oil	>480	ND	E	Green	Turpentine	>480	ND	E	Green
Gasoline (unleaded)	>480	ND	E	Green	Vinyl Acetate	22	155.57	G	Yellow
Gunk Oil Cutting	>480	ND	E	Green	Water Sealant, clear	>480	ND	E	Green
Heptane	456	0.17	G	Green	Weed Killer	>480	ND	E	Green
Herbicide	>480	ND	E	Green	Window Cleaner	>480	ND	E	Green
n-Hexane	>480	ND	E	Green	Wood Finish	>480	ND	E	Green
Hydraulic Break Fluid	>480	ND	E	Green	Xylene	24	681	G	Green
Hydrogen Peroxide	>480	ND	G	Yellow					
Isobutylene	>480	ND	E	Green					

ND = Not Detected Immed = Immediate

## Conditions/Color Codes

### GREEN

Condition 1	
PB	>240
PR	Any
D	E, G
Condition 2	
PB	>30
PR	<100
D	E, G

### RED

Condition 1	
PB	Any
PR	Any
D	NR
Condition 2	
PB	<30
PR	Any
D	P

### YELLOW

Any Other Condition

### TAN

No Results Reported

## Criteria for Chemical Resistance Guide

### Permeation Breakthrough Time (PB)

Rating	Minute
Excellent	> 240
Good	> 30
Poor	≥ 10
Not Rated	< 10


### Degradation (D)

Rating
Excellent (E)
Good (G)
Poor (P)
Not Recommended (NR)

### Permeation Rate (PR)

Rating	µg/cm <sup>2</sup> /min
Excellent	< 1
Good	< 100
Poor	< 100

# KLEENGUARD\* G80 Neoprene / Latex† Chemical Resistant Gloves

 <b>KLEENGUARD* G80 Neoprene/Latex† Chemical Resistant Glove</b>	ASTM F739		Degredation (D)	Overall Rating		ASTM F739		Degredation (D)	Overall Rating
	Permeation Breakthrough Time (PB)	Permeation Breakthrough Rate (PR)				Permeation Breakthrough Time (PB)	Permeation Breakthrough Rate (PR)		
Acetaldehyde	4	141	E	Green	Isopropyl Alcohol	63	38.6	E	Green
Acetic Acid	66	19.3	E	Green	Linseed Oil	90	0.31	G	Green
Aluminum Sulfate	>480	ND		Yellow	Methyl Ethyl Ketone	4	231	P	Red
Ammonia	44	1.1		Yellow	Methyl Formate	4	385		Red
Ammonia Household Cleaner	>480	ND		Yellow	Methylene Bisphenylisocyanate 4,4	>480	ND		Yellow
Ammonium Hydroxide	49	197	E	Yellow	Mineral Spirits	74	0.3	G	Green
Aniline	28	59.8	E	Yellow	Muriatic Acid	>480	ND	E	Green
Boric Acid	>480	ND	E	Green	n-Methyl-2-Pyrrolidinone	96	15.9		Yellow
Chloracetone	11	59.4		Red	Nitric Acid	240		G	Green
Chlorine Gas	>480	ND		Yellow	Oleic Acid	>480	ND	G	Green
Chromic Acid	>480	ND	P	Yellow	Phenol	8	60.4	E	Yellow
Citric Acid	>480	ND	E	Green	Phosphoric Acid	>480	ND	G	Green
Cutting Oil	>480	ND		Yellow	Polyurethane	55	64.2	G	Green
Cyclohexane	39	54	E	Yellow	Potash (KOH)	>480	ND		Green
Diethyl Ether	2	High		Red	Potassium Hydroxide	>480	ND	E	Yellow
Dimethylformamide-n,n	28	16.8		Yellow	Rust Remover	275	0.3	E	Green
Ethyl Alcohol	34	0.56	E	Green	Sodium Hydroxide	>480	ND	E	Green
Ethylene Glycol	79	1.32	E	Green	Sodium Hypochlorite	>480	ND	E	Green
Fertilizer	>480	ND	E	Green	Sulfuric Acid 47%	>480	ND	E	Green
Formaldehyde	116	0.31	E	Green	Sulfuric Acid 98%	45	276	NR	Red
Furniture Polish	>480	ND		Green	Turpentine	32	587	NR	Red
Herbicide	>480	ND	E	Green	Vinyl Acetate	4	High	NR	Red
n-Hexane	22	8.2	P	Red	Window Cleaner	141	0.12	G	Green
Hydrochloric Acid	310	29.6	E	Green	Wood Finish	36	59	G	Green
Hydrofluoric Acid	>480	ND	E	Green	Xylene	6	681	P	Red
Hydrogen Peroxide	>480	ND	G	Green					

ND = Not Detected NR = Not Recommended

## Conditions/Color Codes


GREEN	
<b>Condition 1</b>	
PB	>240
PR	Any
D	E, G
<b>Condition 2</b>	
PB	>30
PR	<100
D	E, G

RED	
<b>Condition 1</b>	
PB	Any
PR	Any
D	NR
<b>Condition 2</b>	
PB	<30
PR	Any
D	P

YELLOW	
<b>Any Other Condition</b>	

TAN	
<b>No Results Reported</b>	

## KLEENGUARD\* G80 PVC Chemical Resistant Gloves

 <b>KLEENGUARD* G80 PVC Chemical Resistant Glove</b>	ASTM F739		Degradation (D)	Overall Rating
	Permeation Breakthrough Time (PB)	Permeation Breakthrough Rate (PR)		
Aniline	103	59.8	P	
Bromopropionic Acid	152	197	G	
Butyl Carbitol	81	104.1	E	
Chromic Acid	>480	ND	G	
Ethyl Alcohol	80	29.6	G	
Ethylene Glycol	>480	ND	P	
Fertilizer	>480	ND	E	
Formic Acid	>480	ND	E	
Glutaraldehyde	>480	ND		
Methylene Bisphenyl isocyanate 4,4-	>480	ND		
Nitric Acid	142	134	P	
Oleum	35	316	P	
Phenol	65	60.4	G	
Sulfuric Acid 95-98%	79	316	G	
Xylene	14	681	NR	

ND = Not Detected NR = Not Recommended

Ongoing chemical testing for the KLEENGUARD\* G80 Chemical Resistant Gloves will occur and data tables will be updated accordingly.

### Conditions/Color Codes

GREEN	
Condition 1	
PB	>240
PR	Any
D	E, G
Condition 2	
PB	>30
PR	<100
D	E, G

RED	
Condition 1	
PB	Any
PR	Any
D	NR
Condition 2	
PB	<30
PR	Any
D	P

YELLOW	
Any Other Condition	

TAN	
No Results Reported	

† Caution: This product contains Natural Rubber Latex which may cause allergic reactions.

Kimberly-Clark warrants that its products comply with K-C's standard specifications as of the delivery date to K-C's authorized distributors/direct purchasers. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. K-C is not liable for any kind of special, incidental, or consequential damages. K-C's liability for breach of contract, tort, or other cause of action shall not exceed the product purchase price. Purchasers and users are deemed to have accepted the above warranty and limitation of liability, and cannot change the terms by verbal agreement or by any writing not signed by K-C.

△ WARNINGS: Improper use or failure to heed warnings may result in serious injury or death.

Gloves should be replaced immediately if ripped, torn, abraded or punctured.

Gloves are not flame resistant. Keep away from sparks, flames and sources of heat and ignition. Melting fabric can cause severe burns.

It is the responsibility of the user to assess the types of hazards and the risks associated with exposure and then decide on the appropriate personal protective equipment needed for each circumstance.

The information provided within this literature refers to the performance of the film only, in the laboratory under controlled conditions.

Kimberly-Clark makes no representation that its products will provide complete protection from exposure to contaminants.