

## Chemical Permeation test results

### Comparing Kimtech™ Polaris™ and Kimtech™ Polaris™ Xtra Nitrile Gloves

Chemical Name	CAS N°	Concentration	Kimtech™ Polaris™ Nitrile Gloves			Kimtech™ Polaris™ Xtra Nitrile Gloves		
			Chemical Permeation EN ISO 374-1		Degradation EN 374-4	Chemical Permeation EN ISO 374-1		Degradation EN 374-4
			Level	BTT <sup>1</sup> (min)	%	Level	BTT <sup>1</sup> (min)	%
n-Heptane (J)	142-82-5	100%	5	>240	8.10%	6	>480	-15.60%
Sodium Hydroxide (K)	1310-73-2	40%	6	>480	-2.70%	6	>480	-0.30%
Hydrogen Peroxide (P)	7722-84-1	30%	3	>60 (91)	43.20%	3	>60 (91)	40.10%
Formaldehyde (T)	50-00-0	37%	6	>480	14.20%	6	>480	12.80%
Ammonium Hydroxide (O)	1336-21-6	25%	3	>60 (91)	6.80%	3	>60 (91)	25.80%
Glutaraldehyde	111-30-8	50%	6	>480	-68.80%	6	>480	-3.70%
Ethanol	64-17-5	70%	3	>60 (75,7)	58%	3	>60 (90,7)	43.20%
Isopropanol	67-63-0	70%	4	>120 (180,2)	47.90%	4	>120 (224,6)	44.60%
Isopropanol	67-63-0	99%	4	>120 (164)	54.10%	4	>120 (218,6)	40.10%
Acetone	67-64-1	100%	0	0	89.90%	0	0	92.40%
Cyclohexane	110-82-7	99%	6	>480	43.30%	6	>480	14.30%
Dimethyl Sulfoxide (DMSO)	67-68-5	99%	0	<10 (5)	95.20%	0	<10 (9,9)	93.60%
n-Hexane	110-54-3	96%	5	>240 (432,3)	37.30%	6	>480	25.30%
Ethidium Bromide	1239-45-8	1%	6	>480	-19%	6	>480	-2.20%
Acrylamide	79-06-1	40%	6	>480	18.60%	6	>480	32.50%
Perchloric Acid	7601-90-3	70%	6	>480	24.30%	6	>480	42%
Hydrochloric Acid	7647-01-0	37%	6	>480	54.40%	6	>480	39.70%
Sulfuric Acid	7664-93-9	96%	1	>10 (15)	100%	1	>10 (21)	100%
Nitric Acid	7697-37-2	65%	0	<10 (9)	99.90%	0	<10 (8)	99.80%
Acetic Acid	64-19-7	99%	0	<10 (8)	93.90%	1	>10 (13)	94.10%
Hydrofluoric acid	7664-39-3	40%	1	>10 (11)	n/a	1	>10 (19)	n/a
Citric Acid	77-92-9	30%	6	>480	-30.10%	6	>480	-8.90%
Sodium Hypochlorite	7681-52-9	10-13%	6	>480	-24.20%	6	>480	7.80%
Chlorhexidine Gluconate	18472-51-0	4%	6	>480	-40.80%	6	>480	-4.80%
Povidone Iodine	25655-41-8	10%	6	>480	-17.60%	6	>480	-8.70%
Cidex® OPA/ Ortho-phthalaldehyde	N/A	N/A	6	>480	18.30%	6	>480	-0.10%
Quaternary Detergent	N/A	N/A	6	>480	-22.40%	6	>480	-3%
Spor-Klenz	N/A	100%	6	>480	-8.10%	6	>480	-4.30%
Nicotine	54-11-5	98%	1	>10 (21,6)	98.20%	2	>30 (31,6)	96.90%

**IMPORTANT NOTE:** Regarding breakthrough time (BTT), the lowest time corresponding to the Level being achieved during the testing is reported (real BTT is indicated into bracket). For example: if Level 5 has been achieved for a given chemical, result reported will be greater than >240 min whilst real BTT could be anywhere between 240 and 480.

**CAUTION:** IT'S USER'S RESPONSIBILITY TO DETERMINE THE APPLICATION OF THESE GLOVES FOR THEIR INTENDED USE WITH CHEMICALS.

<sup>1</sup>BTT = Breakthrough time

Classification	Unclassified	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Time	<10	10 - 30	30 - 60	60 - 120	120 - 240	240 - 480	>480
Usage	Not recommended	Splash Protection		Medium Protection	High Protection		

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## Chemical Permeation test results

### Comparing Kimtech™ Polaris™ and Kimtech™ Purple Nitrile™ Gloves

Chemical Name	CAS N°	Concentration	Kimtech™ Polaris™ Nitrile Gloves			Kimtech™ Purple Nitrile™ Gloves		
			Chemical Permeation EN ISO 374-1		Degradation EN 374-4	Chemical Permeation EN ISO 374-1		Degradation EN 374-4
			Level	BTT' (min)	%	Level	BTT' (min)	%
n-Heptane (J)	142-82-5	100%	5	>240	8.10%	3	>60 (62)	48%
Sodium Hydroxide (K)	1310-73-2	40%	6	>480	-2.70%	6	>480	-7.90%
Hydrogen Peroxide (P)	7722-84-1	30%	3	>60 (91)	43.20%	6	>480	36%
Formaldehyde (T)	50-00-0	37%	6	>480	14.20%	6	>480	22%
Ammonium Hydroxide (O)	1336-21-6	25%	3	>60 (91)	6.80%	1	>10 (12)	53%
Glutaraldehyde	111-30-8	50%	6	>480	-68.80%	Not tested	-	-
Ethanol	64-17-5	70%	3	>60 (75,7)	58%	2	>30 (41)	56%
Isopropanol	67-63-0	70%	4	>120 (180,2)	47.90%	3	>60 (69)	60%
Isopropanol	67-63-0	99%	4	>120 (164)	54.10%	2	>30 (42)	46%
Acetone	67-64-1	100%	0	0	89.90%	0	<10 (<1)	80%
Cyclohexane	110-82-7	99%	6	>480	43.30%	3	>60 (90)	58%
Dimethyl Sulfoxide (DMSO)	67-68-5	99%	0	<10 (5)	95.20%	0	<10 (1,6)	77%
n-Hexane	110-54-3	96%	5	>240 (432,3)	37.30%	Not tested	-	-
Ethidium Bromide	1239-45-8	1%	6	>480	-19%	6	>480	2.40%
Acrylamide	79-06-1	40%	6	>480	18.60%	Not tested	-	-
Perchloric Acid	7601-90-3	70%	6	>480	24.30%	6	>480	6.40%
Hydrochloric Acid	7647-01-0	37%	6	>480	54.40%	6	>480	34%
Sulfuric Acid	7664-93-9	96%	1	>10 (15)	100%	1	>10 (13)	
Nitric Acid	7697-37-2	65%	0	<10 (9)	99.90%	0	<10 (9,3)	97%
Acetic Acid	64-19-7	99%	0	<10 (8)	93.90%	0	1	98%
Hydrofluoric acid	7664-39-3	40%	1	>10 (11)	n/a	Not tested	-	-
Citric Acid	77-92-9	30%	6	>480	-30.10%	6	>480	9.90%
Sodium Hypochlorite	7681-52-9	10-13%	6	>480	-24.20%	6	>480	1.60%
Chlorhexidine Gluconate	18472-51-0	4%	6	>480	-40.80%	Not tested	-	-
Povidone Iodine	25655-41-8	10%	6	>480	-17.60%	Not tested	-	-
Cidex® OPA/ Ortho-phthalaldehyde	N/A	N/A	6	>480	18.30%	Not tested	-	-
Quaternary Detergent	N/A	N/A	6	>480	-22.40%	Not tested	-	-
Spor-Klenz	N/A	100%	6	>480	-8.10%	Not tested	-	-
Nicotine	54-11-5	98%	1	>10 (21,6)	98.20%	Not tested	-	-

**IMPORTANT NOTE:** Regarding breakthrough time (BTT), the lowest time corresponding to the Level being achieved during the testing is reporting (real BTT is indicated into bracket). For example: if Level 5 has been achieved for a given chemical, result reported will be greater than >240 min whilst real BTT could be anywhere between 240 and 480.

**CAUTION:** IT'S USER'S RESPONSIBILITY TO DETERMINE THE APPLICATION OF THESE GLOVES FOR THEIR INTENDED USE WITH CHEMICALS.

'BTT = Breakthrough time

Classification	Unclassified	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Time	<10	10 - 30	30 - 60	60 - 120	120 - 240	240 - 480	>480
Usage	Not recommended	Splash Protection		Medium Protection	High Protection		

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## Chemical Permeation test results

### Comparing Kimtech™ Polaris™ Xtra and Kimtech™ Purple Nitrile™ Xtra Gloves

Chemical Name	CAS N°	Concentration	Kimtech™ Polaris™ Xtra Nitrile Gloves			Kimtech™ Purple Nitrile™ Xtra Gloves		
			Chemical Permeation EN ISO 374-1		Degradation EN 374-4	Chemical Permeation EN ISO 374-1		Degradation EN 374-4
			Level	BTT' (min)	%	Level	BTT' (min)	%
n-Heptane (J)	142-82-5	100%	5	>240	8.10%	3	>60 [62]	48%
Sodium Hydroxide (K)	1310-73-2	40%	6	>480	-2.70%	6	>480	-13%
Hydrogen Peroxide (P)	7722-84-1	30%	3	>60 [91]	43.20%	6	>480	36%
Formaldehyde (T)	50-00-0	37%	6	>480	14.20%	6	>480	22%
Ammonium Hydroxide (O)	1336-21-6	25%	3	>60 [91]	6.80%	1	>10 [12]	53%
Glutaraldehyde	111-30-8	50%	6	>480	-68.80%	Not tested	-	-
Ethanol	64-17-5	70%	3	>60 [75,7]	58%	2	41	56%
Isopropanol	67-63-0	70%	4	>120 [180,2]	47.90%	3	69	60%
Isopropanol	67-63-0	99%	4	>120 [164]	54.10%	2	42	46%
Acetone	67-64-1	100%	0	<10 [0]	89.90%	0	<10 [<1]	80%
Cyclohexane	110-82-7	99%	6	>480	43.30%	3	<60 [90]	58%
Dimethyl Sulfoxide (DMSO)	67-68-5	99%	0	<10 [5]	95.20%	0	<10 [1,6]	77%
n-Hexane	110-54-3	96%	5	>240 [432,3]	37.30%	Not tested	-	-
Ethidium Bromide	1239-45-8	1%	6	>480	-19%	6	>480	2.40%
Acrylamide	79-06-1	40%	6	>480	18.60%	Not tested	-	-
Perchloric Acid	7601-90-3	70%	6	>480	24.30%	6	>480	6.40%
Hydrochloric Acid	7647-01-0	37%	6	>480	54.40%	6	>480	34%
Sulfuric Acid	7664-93-9	96%	1	>10 [15]	100%	1	>10 [13]	
Nitric Acid	7697-37-2	65%	0	<10 [9]	99.90%	0	<10 [9,3]	97%
Acetic Acid	64-19-7	99%	0	<10 [8]	93.90%	0	<10 [1]	98%
Hydrofluoric acid	7664-39-3	40%	1	>10 [11]	n/a	Not tested	-	-
Citric Acid	77-92-9	30%	6	>480	-30.10%	6	>480	9.90%
Sodium Hypochlorite	7681-52-9	10-13%	6	>480	-24.20%	6	>480	1.60%
Chlorhexidine Gluconate	18472-51-0	4%	6	>480	-40.80%	Not tested	-	-
Povidone Iodine	25655-41-8	10%	6	>480	-17.60%	Not tested	-	-
Cidex® OPA/ Ortho-phthalaldehyde	N/A	N/A	6	>480	18.30%	Not tested	-	-
Quaternary Detergent	N/A	N/A	6	>480	-22.40%	Not tested	-	-
Spor-Klenz	N/A	100%	6	>480	-8.10%	Not tested	-	-
Nicotine	54-11-5	98%	1	>10 [21,6]	98.20%	Not tested	-	-

**IMPORTANT NOTE:** Regarding breakthrough time (BTT), the lowest time corresponding to the Level being achieved during the testing is reported (real BTT is indicated into bracket). For example: if Level 5 has been achieved for a given chemical, result reported will be greater than >240 min whilst real BTT could be anywhere between 240 and 480.

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Classification	Unclassified	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Time	<10	10 - 30	30 - 60	60 - 120	120 - 240	240 - 480	>480
Usage	Not recommended	Splash Protection		Medium Protection	High Protection		

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## Chemotherapy Drugs test results

### Comparing Kimtech™ Polaris™ and Kimtech™ Polaris™ Xtra Nitrile Glove

ChemoTherapy Drugs Test Method ASTM D6978	Concentration	Minimum Breakthrough Time (in Minutes)	
		Kimtech™ Polaris™ Nitrile Gloves	Kimtech™ Polaris™ Xtra Nitrile Gloves
Carmustine	3,3 mg/ml	76.6	78.1
Cyclophosphamide	20 mg/ml	>240	>240
Doxorubicin HCl	2 mg/ml	>240	>240
Etoposide	20 mg/ml	>240	>240
Fluorouracil	50 mg/ml	>240	>240
Paclitaxel	6 mg/ml	>240	>240
Thiotepa	10 mg/ml	78.5	>240
Avastin (Bevacizumab)	25 mg/ml	>240	>240
Cabazitaxel	60 mg/1,5 ml	>240	>240
Capecitabine	26 mg/ml	>240	>240
Cisplatin	1 mg/ml	>240	>240
Dacarbazine	10 mg/ml	>240	>240
Eribulin Mesylate	0,5 mg/ml	>240	>240
Floxuridine	100 mg/ml	>240	>240
Ifosfamide	50 mg/ml	>240	>240
Lenvatinib	20 mg/ml	>240	>240
Mitoxantrone HCl	2 mg/ml	>240	>240
Oxaliplatin	5 mg/ml	>240	>240
Pemetrexed	25 mg/ml	>240	>240
Sorafenib Tosylate	200 mg/ml	>240	>240
Tamoxifen	2 mg/ml	>240	>240
Vinblastine sulfate (Velbe)	1 mg/ml	>240	>240
Vincristine sulfate	1 mg/ml	>240	>240
Vinorelbine	10 mg/ml	>240	>240

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<10	Not recommended for use - Breakthrough can occur in less than 10 min.
11-239	Use with caution - Breakthrough can occur between 11 and 239 min.
>240	Recommended for protection - no Breakthrough up to 240 min.

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## Chemotherapy Drugs test results

### Comparing Kimtech™ Polaris™ and Kimtech™ Purple™ Nitrile Gloves

ChemoTherapy Drugs Test Method ASTM D6978	Concentration	Minimum Breakthrough Time (in Minutes)	
		Kimtech™ Polaris™ Nitrile Gloves	Kimtech™ Purple™ Nitrile™ Gloves
Carmustine	3,3 mg/ml	76.6	10.4
Cyclophosphamide	20 mg/ml	>240	>240
Doxorubicin HCl	2 mg/ml	>240	>240
Etoposide	20 mg/ml	>240	>240
Fluorouracil	50 mg/ml	>240	>240
Paclitaxel	6 mg/ml	>240	>240
Thiotepa	10 mg/ml	78.5	>240
Avastin (Bevacizumab)	25 mg/ml	>240	Not tested
Cabazitaxel	60 mg/1,5 ml	>240	Not tested
Capecitabine	26 mg/ml	>240	Not tested
Cisplatin	1 mg/ml	>240	>240
Dacarbazine	10 mg/ml	>240	>240
Eribulin Mesylate	0,5 mg/ml	>240	Not tested
Floxuridine	100 mg/ml	>240	Not tested
Ifosfamide	50 mg/ml	>240	>240
Lenvatinib	20 mg/ml	>240	Not tested
Mitoxantrone HCl	2 mg/ml	>240	>240
Oxaliplatin	5 mg/ml	>240	Not tested
Pemetrexed	25 mg/ml	>240	Not tested
Sorafenib Tosylate	200 mg/ml	>240	Not tested
Tamoxifen	2 mg/ml	>240	Not tested
Vinblastine sulfate (Velbe)	1 mg/ml	>240	Not tested
Vincristine sulfate	1 mg/ml	>240	>240
Vinorelbine	10 mg/ml	>240	Not tested

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Paclitaxel	6 mg/ml	>240	>240
Thiotepa	10 mg/ml	>240	>240
Avastin (Bevacizumab)	25 mg/ml	>240	Not tested
Cabazitaxel	60 mg/1,5 ml	>240	Not tested
Capecitabine	26 mg/ml	>240	Not tested
Cisplatin	1 mg/ml	>240	>240
Dacarbazine	10 mg/ml	>240	>240
Eribulin Mesylate	0,5 mg/ml	>240	Not tested
Floxuridine	100 mg/ml	>240	Not tested
Ifosfamide	50 mg/ml	>240	>240
Lenvatinib	20 mg/ml	>240	Not tested
Mitoxantrone HCl	2 mg/ml	>240	>240
Oxaliplatin	5 mg/ml	>240	Not tested
Pemetrexed	25 mg/ml	>240	Not tested
Sorafenib Tosylate	200 mg/ml	>240	Not tested
Tamoxifen	2 mg/ml	>240	Not tested
Vinblastine sulfate (Velbe)	1 mg/ml	>240	Not tested
Vincristine sulfate	1 mg/ml	>240	>240
Vinorelbine	10 mg/ml	>240	Not tested

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