**Scroll Down to see the data for our 158-T-26 Organic Vapor Acid Gas Cartridge.**

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**or call Toll Free 1-888-533-6832**

# ESTIMATED CARTRIDGE BREAKTHROUGH TIME FOR
# DENTEC SAFETY SPECIALISTS 158-T-20 ORGANIC VAPOR CARTRIDGE PAIR

MEDIUM WORK RATE, 22 oC AND LESS THAN 65 % RH

| **Chemical** | **CAS No.** | **ESTIMATED CARTRIDGE SERVICE LIFE IN HOURS AT** | | | | |
|---|---|---|---|---|---|---|
| | | **10 ppm** | **50 ppm** | **100 ppm** | **500 ppm** | **1000 ppm** |
| Acetic anhydride | 108-24-7 | 137 | 47 | 29 | 10 | **6.3** |
| Acetone | 67-64-1 | 36 | 12 | 7.7 | 2.6 | **1.7** |
| Acrylonitrile | 107-13-1 | 48 | 16 | 10 | 3.5 | **2.2** |
| Allyl acetate | 591-87-7 | 84 | 29 | 18 | 6.1 | **3.8** |
| Allyl alcohol | 107-18-6 | 73 | 25 | 16 | 5.3 | **3.3** |
| Allyl chloride | 107-05-1 | 34 | 12 | 7.3 | 2.5 | **1.6** |
| Benzene | 71-43-2 | 81 | 27 | 17 | 5.9 | **3.7** |
| Bromobenzene | 108-86-1 | 139 | 47 | 30 | 10 | **6.3** |
| Butanol | 71-36-3 | 127 | 43 | 27 | 9.3 | **5.8** |
| Butanol, 2- | 78-92-2 | 106 | 36 | 23 | 7.7 | **4.9** |
| Butanone, 2- | 78-93-3 | 80 | 27 | 17 | 5.8 | **3.7** |
| Butyl acetate | 123-86-4 | 85 | 29 | 18 | 6.2 | **3.9** |
| Butyl acetate, sec | 105-46-4 | 92 | 31 | 20 | 6.7 | **4.2** |
| Butylamine | 109-73-9 | 107 | 37 | 23 | 7.8 | **4.9** |
| Carbon tetrachloride | 56-23-5 | 85 | 29 | 18 | 6.2 | **3.9** |
| Chlorobenzene | 108-90-7 | 118 | 40 | 25 | 8.6 | **5.4** |
| Chlorobutane, 1- | 109-69-3 | 80 | 27 | 17 | 5.8 | **3.6** |
| Chlorocyclopentane | 930-28-9 | 86 | 29 | 18 | 6.3 | **3.9** |
| Chloroform | 67-66-3 | 37 | 12 | 7.8 | 2.7 | **1.7** |
| Chloroheptane, 1- | 629-06-1 | 91 | 31 | 19 | 6.6 | **4.1** |
| Chlorohexane, 1- | 544-10-5 | 85 | 29 | 18 | 6.2 | **3.9** |
| Chloromethyl heptane, 3- | | 70 | 24 | 15 | 5.1 | **3.2** |
| Chloropentane, 1- | 543-59-9 | 83 | 28 | 18 | 6 | **3.8** |
| Chloropropane, 1- | 540-54-5 | 28 | 9.4 | 5.9 | 2 | **1.3** |
| Chloropropane, 2- | 75-29-6 | 29 | 10 | 6.2 | 2.1 | **1.3** |
| Chlorotoluene, o- | 98-88-4 | 113 | 38 | 24 | 8.2 | **5.2** |
| Chloro-2-methylbutane, 2- | 594-36-5 | 65 | 22 | 14 | 4.7 | **3** |
| Chloro-2-methylpropane, 2- | 507-20-0 | 41 | 14 | 9 | 3 | **1.9** |
| Cumene | 98-82-8 | 90 | 30 | 19 | 6.5 | **4.1** |
| Cycloheptatriene, 1,3,5- | 544-25-2 | 118 | 40 | 25 | 8.6 | **5.4** |
| Cyclohexane | 110-82-7 | 67 | 23 | 14 | 4.9 | **3.1** |
| Cyclohexanone | 108-94-1 | 123 | 42 | 26 | 8.9 | **5.6** |
| Cyclohexene | 110-83-8 | 84 | 29 | 18 | 6.1 | **3.8** |
| Cyclohexylamine | 108-91-8 | 109 | 37 | 23 | 8 | **5** |
| Cyclooctane | 292-64-8 | 95 | 32 | 20 | 6.9 | **4.3** |
| Cyclopentanone | 120-92-3 | 138 | 47 | 29 | 10 | **6.3** |
| Cymene, p- | 99-87-6 | 84 | 29 | 18 | 6.1 | **3.8** |
| Decane | 124-18-5 | 69 | 24 | 15 | 5 | **3.2** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Dibromoethane, 1,2- | 106-93-4 | 138 | 47 | 29 | 10 | **6.3** |
| Dibromomethane | 74-95-3 | 80 | 27 | 17 | 5.8 | **3.7** |
| Dibutylamine | 111-92-2 | 74 | 25 | 16 | 5.4 | **3.4** |
| Dichlorobenzene, 1,2- | 95-50-1 | 121 | 41 | 26 | 8.8 | **5.5** |
| Dichlorobutane, 1,4- | 110-56-5 | 120 | 41 | 26 | 8.7 | **5.5** |
| Dichloroethane, 1,1- | 75-34-3 | 25 | 8.7 | 5.4 | 1.9 | **1.2** |
| Dichloroethane, 1,2- | 107-06-2 | 60 | 20 | 13 | 4.3 | **2.7** |
| Dichloroethylene, 1,2-cis | 156-59-2 | 33 | 11 | 7.1 | 2.4 | **1.5** |
| Dichloroethylene, 1,2-trans | 156-60-5 | 37 | 12 | 7.8 | 2.7 | **1.7** |
| Dichloromethane | 75-09-2 | 11 | 3.8 | 2.4 | 0.8 | **0.5** |
| Dichloropropane, 1,2- | 78-87-5 | 72 | 24 | 15 | 5.2 | **3.3** |
| Dichloropropene, 1,3-cis, trans | 542-75-6 | 95 | 32 | 20 | 6.9 | **4.4** |
| Diethylamine | 109-89-7 | 86 | 29 | 18 | 6.3 | **3.9** |
| Diisobutyl ketone | 108-83-8 | 69 | 24 | 15 | 5 | **3.2** |
| Diisopropylamine | 108-18-9 | 75 | 26 | 16 | 5.5 | **3.4** |
| Dimethylamine | 124-40-3 | 17 | 5.6 | 3.5 | 1.2 | **0.8** |
| Dimethylbutane, 2,3- | 79-29-8 | 70 | 24 | 15 | 5.1 | **3.2** |
| Dipropylamine | 142-84-7 | 91 | 31 | 19 | 6.6 | **4.2** |
| Epichlorohydrin | 106-89-8 | 95 | 32 | 20 | 6.9 | **4.4** |
| Ethanol | 64-17-5 | 31 | 11 | 6.6 | 2.3 | **1.4** |
| Ethoxyethanol, 2- | 110-80-5 | 85 | 29 | 18 | 6.2 | **3.9** |
| Ethoxyethlyacetate, 2- | 111-15-9 | 89 | 30 | 19 | 6.4 | **4** |
| Ethyl acetate | 141-78-6 | 74 | 25 | 16 | 5.4 | **3.4** |
| Ethyl benzene | 100-41-4 | 93 | 32 | 20 | 6.8 | **4.2** |
| Ethyl chloride | 75-00-3 | 6.6 | 2.3 | 1.4 | 0.5 | **0.3** |
| Ethylamine | 75-04-7 | 40 | 14 | 9 | 2.9 | **1.8** |
| Ethylidene, 5 - norbornene, 2- | 16219-75-3 | 85 | 29 | 18 | 6.2 | **3.9** |
| Ethyl-1-butanol, 2- | 97-95-0 | 85 | 29 | 18 | 6.2 | **3.9** |
| Heptane | 142-82-5 | 76 | 26 | 16 | 5.5 | **3.5** |
| Heptanone, 2- | 110-43-0 | 99 | 34 | 21 | 7.2 | **4.5** |
| Heptanone, 3- | 106-35-4 | 89 | 30 | 19 | 6.5 | **4.1** |
| Hexane | 110-54-3 | 51 | 17 | 11 | 3.7 | **2.3** |
| Hexyl acetate | 142-92-7 | 74 | 25 | 16 | 5.4 | **3.4** |
| Isopentyl acetate | 123-92-2 | 79 | 27 | 17 | 5.7 | **3.6** |
| Isopropanol | 67-63-0 | 60 | 20 | 13 | 4.3 | **2.7** |
| Isopropenyl acetate | 108-22-5 | 90 | 30 | 19 | 6.5 | **4.1** |
| Isopropyl acetate | 108-21-4 | 72 | 24 | 15 | 5.2 | **3.3** |
| Isopropylamine | 75-31-0 | 64 | 22 | 14 | 4.7 | **2.9** |
| Mesityl oxide | 141-79-7 | 119 | 41 | 25 | 8.7 | **5.4** |
| Mesitylene | 108-67-8 | 95 | 32 | 20 | 6.9 | **4.4** |
| Methanol | 67-56-1 | 0.2 | 0.1 | 0.05 | 0.02 | **0.01** |
| Methoxyethanol, 2- | 109-86-4 | 128 | 44 | 27 | 9.3 | **5.9** |
| Methoxyethylacetate, 2- | 110-49-6 | 103 | 35 | 22 | 7.5 | **4.7** |
| Methyl acetate | 79-20-9 | 37 | 12 | 7.8 | 2.7 | **1.7** |
| Methyl chloride | 74-87-3 | 0.06 | 0.02 | 0.01 | 0.004 | **0.003** |
| Methyl chloroform | 71-55-6 | 44 | 15 | 9 | 3.2 | **2** |
| Methyl iodide | 74-88-4 | 12 | 4 | 2.5 | 0.9 | **0.5** |
| Methylamine | 74-89-5 | 12 | 4 | 2.5 | 0.9 | **0.5** |
| Methylcyclohexane | 108-87-2 | 67 | 23 | 14 | 4.9 | **3.1** |
| Methylcyclohexanone, 4- | 589-92-4 | 108 | 37 | 23 | 7.9 | **5** |
| Methylcyclopentane | 96-37-7 | 61 | 21 | 13 | 4.4 | **2.8** |
| Methyl-3 - cyclohexanone | 591-24-2 | 99 | 34 | 21 | 7.2 | **4.5** |
| Methyl-3-butanol, 1- | 123-51-3 | 107 | 37 | 23 | 7.8 | **4.9** |
| Methyl-4 - pentanone,2- | 108-10-1 | 94 | 32 | 20 | 6.8 | **4.3** |
| Methyl-4-pentanol, 2- | 108-11-2 | 83 | 28 | 18 | 6 | **3.8** |
| Methyl-5 - heptanone, 3- | 541-85-5 | 84 | 29 | 18 | 6.1 | **3.8** |
| Nitropropane, 1- | 108-03-2 | 140 | 48 | 30 | 10 | **6.4** |
| Nonane | 111-84-2 | 74 | 25 | 16 | 5.4 | **3.4** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pentachloroethane | 76-01-7 | 103 | 35 | 22 | 7.5 | **4.7** |
| Pentane | 109-66-0 | 60 | 20 | 13 | 4.3 | **2.7** |
| Pentanedione, 2,4- | 123-54-6 | 127 | 43 | 27 | 9.2 | **5.8** |
| Pentanol | 71-41-0 | 113 | 38 | 24 | 8.2 | **5.2** |
| Pentanol, 2- | 6032-29-7 | 96 | 33 | 21 | 7 | **4.4** |
| Pentanone, 2- | 107-87-9 | 102 | 35 | 22 | 7.4 | **4.6** |
| Pentanone, 3- | 96-22-0 | 92 | 31 | 20 | 6.7 | **4.2** |
| Pentyl acetate | 628-63-7 | 81 | 27 | 17 | 5.9 | **3.7** |
| Perchloroethylene | 127-18-4 | 118 | 40 | 25 | 8.6 | **5.4** |
| Propanol | 71-23-8 | 77 | 26 | 17 | 5.6 | **3.5** |
| Propyl acetate | 109-60-4 | 87 | 30 | 19 | 6.4 | **4** |
| Propylamine | 107-10-8 | 88 | 30 | 19 | 6.4 | **4** |
| Pyridine | 110-86-1 | 116 | 40 | 25 | 8.5 | **5.3** |
| Tetrachloroethane, 1,1,2,2- | 79-34-5 | 115 | 39 | 25 | 8.4 | **5.3** |
| Toluene | 108-88-3 | 104 | 35 | 22 | 7.6 | **4.8** |
| Trichloroethane, 1,1,2- | 79-00-5 | 80 | 27 | 17 | 5.8 | **3.6** |
| Trichloroethylene | 79-01-6 | 61 | 21 | 13 | 4.4 | **2.8** |
| Trichloropropane, 1,2,3- | 96-18-4 | 123 | 42 | 26 | 8.9 | **5.6** |
| Triethylamine | 121-44-8 | 79 | 27 | 17 | 5.8 | **3.6** |
| Trimethlypentane, 2,2,4- | 540-84-1 | 66 | 23 | 14 | 4.8 | **3** |
| Trimethylhexane, 2,2,5- | 3522-94-9 | 66 | 23 | 14 | 4.8 | **3** |
| Vinyl acetate | 108-05-4 | 61 | 21 | 13 | 4.4 | **2.8** |
| Vinyl chloride | 75-01-4 | 4.4 | 1.5 | 0.9 | 0.3 | **0.2** |
| Xylene, m- | 108-38-3 | 110 | 37 | 23 | 8 | **5** |

Bold print numbers represent experimental 1% breakthrough data points obtained in the 1970's adjusted for a medium work rate and the increased carbon volume and capacity of current

This data is applicable for ambient conditions at 22 oC, relative humidities from 0 to 65% and a medium work rate (25 LPM). The other breakthrough times were calculated from Equation 2 taken from

Nelson, G. O. and A. N. Correia, "Respirator Cartridge Efficiency Studies: VIII Summary and Conclusions"

Am. Ind. Hyg. Assoc. J. 37: 514 (1976). These tests and calculations assume no safety factor.

For temperatures at 32 oC, multiply breakthrough times by 0.8.

For temperatures at 12 oC, multiply breakthrough times by 1.2.

For relative humidities between 65 and 80 %, multiply breakthrough times by 0.9.

For relative humidities between 80 and 95 %, multiply breakthrough times by 0.8.

For heavy work rates (35 LPM), multiply breakthrough times by 0.7.

For light work rates (15 LPM), multiply breakthrough times by 1.7.

These tests were performed under laboratory conditions and not under actual use conditions. Miller-Nelson Research Inc makes no warranties concerning protection by these air purifying respirator devices.

These are estimates and the user should determine the suitability of the devices under actual field conditions.

Compiled by Miller-Nelson Research Inc, 8 HarrisCt., Suite C-6, Monterey, CA 93940

# ESTIMATED CARTRIDGE BREAKTHROUGH TIME FOR
# DENTEC SAFETY SPECIALISTS 158-T-26 ORGANIC VAPOR/ACID GAS CARTRIDGE PAIR

MEDIUM WORK RATE, 22 oC AND LESS THAN 65 % RH

| Chemical | CAS No. | ESTIMATED CARTRIDGE SERVICE LIFE IN HOURS AT | | | | |
|---|---|---|---|---|---|---|
| | | 10 ppm | 50 ppm | 100 ppm | 500 ppm | 1000 ppm |
| Acetic anhydride | 108-24-7 | 121 | 41 | 26 | 8.8 | **5.5** |
| Acetone | 67-64-1 | 33 | 11 | 7 | 2.4 | **1.5** |
| Acrylonitrile | 107-13-1 | 44 | 15 | 9.3 | 3.2 | **2** |
| Allyl acetate | 591-87-7 | 74 | 25 | 16 | 5.4 | **3.4** |
| Allyl alcohol | 107-18-6 | 64 | 22 | 14 | 4.7 | **2.9** |
| Allyl chloride | 107-05-1 | 30 | 10 | 6.5 | 2.2 | **1.4** |
| Benzene | 71-43-2 | 71 | 24 | 15 | 5.2 | **3.3** |
| Bromobenzene | 108-86-1 | 126 | 43 | 27 | 9.2 | **5.8** |
| Butanol | 71-36-3 | 112 | 38 | 24 | 8.2 | **5.1** |
| Butanol, 2- | 78-92-2 | 94 | 32 | 20 | 6.8 | **4.3** |
| Butanone, 2- | 78-93-3 | 73 | 25 | 16 | 5.3 | **3.3** |
| Butyl acetate | 123-86-4 | 75 | 26 | 16 | 5.5 | **3.4** |
| Butyl acetate, sec | 105-46-4 | 81 | 28 | 17 | 5.9 | **3.7** |
| Butylamine | 109-73-9 | 98 | 33 | 21 | 7.1 | **4.5** |
| Carbon tetrachloride | 56-23-5 | 75 | 26 | 16 | 5.5 | **3.4** |
| Chlorobenzene | 108-90-7 | 105 | 36 | 22 | 7.6 | **4.8** |
| Chlorobutane, 1- | 109-69-3 | 70 | 24 | 15 | 5.1 | **3.2** |
| Chlorocyclopentane | 930-28-9 | 76 | 26 | 16 | 5.5 | **3.5** |
| Chloroform | 67-66-3 | 32 | 11 | 6.9 | 2.3 | **1.5** |
| Chloroheptane, 1- | 629-06-1 | 80 | 27 | 17 | 5.8 | **3.7** |
| Chlorohexane, 1- | 544-10-5 | 75 | 26 | 16 | 5.5 | **3.4** |
| Chloromethyl heptane, 3- | | 62 | 21 | 13 | 4.5 | **2.8** |
| Chloropentane, 1- | 543-59-9 | 73 | 25 | 16 | 5.3 | **3.3** |
| Chloropropane, 1- | 540-54-5 | 24 | 8.3 | 5.2 | 1.8 | **1.1** |
| Chloropropane, 2- | 75-29-6 | 25 | 8.6 | 5.4 | 1.8 | **1.2** |
| Chlorotoluene, o- | 98-88-4 | 100 | 34 | 21 | 7.2 | **4.6** |
| Chloro-2-methylbutane, 2- | 594-36-5 | 58 | 20 | 12 | 4.2 | **2.6** |
| Chloro-2-methylpropane, 2- | 507-20-0 | 36 | 12 | 8 | 2.6 | **1.7** |
| Cumene | 98-82-8 | 79 | 27 | 17 | 5.8 | **3.6** |
| Cycloheptatriene, 1,3,5- | 544-25-2 | 108 | 37 | 23 | 7.8 | **4.9** |
| Cyclohexane | 110-82-7 | 61 | 21 | 13 | 4.5 | **2.8** |
| Cyclohexanone | 108-94-1 | 112 | 38 | 24 | 8.1 | **5.1** |
| Cyclohexene | 110-83-8 | 76 | 26 | 16 | 5.6 | **3.5** |
| Cyclohexylamine | 108-91-8 | 100 | 34 | 21 | 7.2 | **4.6** |
| Cyclooctane | 292-64-8 | 86 | 29 | 18 | 6.3 | **3.9** |
| Cyclopentanone | 120-92-3 | 125 | 43 | 27 | 9.1 | **5.7** |
| Cymene, p- | 99-87-6 | 74 | 25 | 16 | 5.4 | **3.4** |
| Decane | 124-18-5 | 63 | 21 | 13 | 4.6 | **2.9** |
| Dibromoethane, 1,2- | 106-93-4 | 125 | 43 | 27 | 9.1 | **5.7** |
| Dibromomethane | 74-95-3 | 73 | 25 | 16 | 5.3 | **3.3** |
| Dibutylamine | 111-92-2 | 68 | 23 | 14 | 4.9 | **3.1** |
| Dichlorobenzene, 1,2- | 95-50-1 | 107 | 36 | 23 | 7.7 | **4.9** |
| Dichlorobutane, 1,4- | 110-56-5 | 106 | 36 | 23 | 7.7 | **4.8** |
| Dichloroethane, 1,1- | 75-34-3 | 22 | 7.6 | 4.8 | 1.6 | **1** |
| Dichloroethane, 1,2- | 107-06-2 | 53 | 18 | 11 | 3.8 | **2.4** |
| Dichloroethylene, 1,2-cis | 156-59-2 | 29 | 10 | 6.3 | 2.1 | **1.3** |
| Dichloroethylene, 1,2-trans | 156-60-5 | 32 | 11 | 6.9 | 2.3 | **1.5** |
| Dichloromethane | 75-09-2 | 10 | 3.3 | 2.1 | 0.7 | **0.4** |
| Dichloropropane, 1,2- | 78-87-5 | 64 | 22 | 14 | 4.6 | **2.9** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Dichloropropene, 1,3-cis, trans | 542-75-6 | 84 | 29 | 18 | 6.1 | **3.8** |
| Diethylamine | 109-89-7 | 78 | 27 | 17 | 5.7 | **3.6** |
| Diisobutyl ketone | 108-83-8 | 63 | 21 | 13 | 4.6 | **2.9** |
| Diisopropylamine | 108-18-9 | 68 | 23 | 15 | 5 | **3.1** |
| Dimethylamine | 124-40-3 | 15 | 5.1 | 3.2 | 1.1 | **0.7** |
| Dimethylbutane, 2,3- | 79-29-8 | 64 | 22 | 14 | 4.7 | **2.9** |
| Dipropylamine | 142-84-7 | 83 | 28 | 18 | 6 | **3.8** |
| Epichlorohydrin | 106-89-8 | 84 | 29 | 18 | 6.1 | **3.8** |
| Ethanol | 64-17-5 | 27 | 9.3 | 5.8 | 2 | **1.3** |
| Ethoxyethanol, 2- | 110-80-5 | 75 | 26 | 16 | 5.5 | **3.4** |
| Ethoxyethlyacetate, 2- | 111-15-9 | 78 | 27 | 17 | 5.7 | **3.6** |
| Ethyl acetate | 141-78-6 | 65 | 22 | 14 | 4.8 | **3** |
| Ethyl benzene | 100-41-4 | 82 | 28 | 18 | 6 | **3.8** |
| Ethyl chloride | 75-00-3 | 5.9 | 2 | 1.3 | 0.4 | **0.3** |
| Ethylamine | 75-04-7 | 36 | 12 | 7.8 | 2.7 | **1.7** |
| Ethylidene, 5 - norbornene, 2- | 16219-75-3 | 77 | 26 | 17 | 5.6 | **3.5** |
| Ethyl-1-butanol, 2- | 97-95-0 | 75 | 26 | 16 | 5.5 | **3.4** |
| Heptane | 142-82-5 | 69 | 24 | 15 | 5 | **3.2** |
| Heptanone, 2- | 110-43-0 | 90 | 31 | 19 | 6.5 | **4.1** |
| Heptanone, 3- | 106-35-4 | 81 | 28 | 17 | 5.9 | **3.7** |
| Hexane | 110-54-3 | 46 | 16 | 10 | 3.4 | **2.1** |
| Hexyl acetate | 142-92-7 | 65 | 22 | 14 | 4.8 | **3** |
| Isopentyl acetate | 123-92-2 | 69 | 24 | 15 | 5 | **3.2** |
| Isopropanol | 67-63-0 | 53 | 18 | 11 | 3.8 | **2.4** |
| Isopropenyl acetate | 108-22-5 | 79 | 27 | 17 | 5.8 | **3.6** |
| Isopropyl acetate | 108-21-4 | 64 | 22 | 14 | 4.6 | **2.9** |
| Isopropylamine | 75-31-0 | 59 | 20 | 13 | 4.3 | **2.7** |
| Mesityl oxide | 141-79-7 | 108 | 37 | 23 | 7.9 | **5** |
| Mesitylene | 108-67-8 | 84 | 29 | 18 | 6.1 | **3.8** |
| Methanol | 67-56-1 | 0.2 | 0.1 | 0.04 | 0.01 | **0.01** |
| Methoxyethanol, 2- | 109-86-4 | 113 | 39 | 24 | 8.2 | **5.2** |
| Methoxyethylacetate, 2- | 110-49-6 | 91 | 31 | 19 | 6.6 | **4.2** |
| Methyl acetate | 79-20-9 | 32 | 11 | 6.9 | 2.3 | **1.5** |
| Methyl chloride | 74-87-3 | 0.05 | 0.02 | 0.01 | 0.004 | **0.002** |
| Methyl chloroform | 71-55-6 | 39 | 13 | 8.4 | 2.8 | **1.8** |
| Methyl iodide | 74-88-4 | 11 | 3.6 | 2.3 | 0.8 | **0.5** |
| Methylamine | 74-89-5 | 11 | 3.6 | 2.3 | 0.8 | **0.5** |
| Methylcyclohexane | 108-87-2 | 61 | 21 | 13 | 4.5 | **2.8** |
| Methylcyclohexanone, 4- | 589-92-4 | 99 | 34 | 21 | 7.2 | **4.5** |
| Methylcyclopentane | 96-37-7 | 55 | 19 | 12 | 4 | **2.5** |
| Methyl-3 - cyclohexanone | 591-24-2 | 90 | 31 | 19 | 6.5 | **4.1** |
| Methyl-3-butanol, 1- | 123-51-3 | 95 | 32 | 20 | 6.9 | **4.3** |
| Methyl-4 - pentanone,2- | 108-10-1 | 85 | 29 | 18 | 6.2 | **3.9** |
| Methyl-4-pentanol, 2- | 108-11-2 | 73 | 25 | 16 | 5.3 | **3.3** |
| Methyl-5 - heptanone, 3- | 541-85-5 | 76 | 26 | 16 | 5.6 | **3.5** |
| Nitropropane, 1- | 108-03-2 | 127 | 43 | 27 | 9.2 | **5.8** |
| Nonane | 111-84-2 | 68 | 23 | 14 | 4.9 | **3.1** |
| Pentachloroethane | 76-01-7 | 91 | 31 | 19 | 6.6 | **4.2** |
| Pentane | 109-66-0 | 54 | 18 | 12 | 3.9 | **2.5** |
| Pentanedione, 2,4- | 123-54-6 | 116 | 39 | 25 | 8.4 | **5.3** |
| Pentanol | 71-41-0 | 100 | 34 | 21 | 7.2 | **4.6** |
| Pentanol, 2- | 6032-29-7 | 85 | 29 | 18 | 6.2 | **3.9** |
| Pentanone, 2- | 107-87-9 | 92 | 31 | 20 | 6.7 | **4.2** |
| Pentanone, 3- | 96-22-0 | 84 | 28 | 18 | 6.1 | **3.8** |
| Pentyl acetate | 628-63-7 | 71 | 24 | 15 | 5.2 | **3.3** |
| Perchloroethylene | 127-18-4 | 105 | 36 | 22 | 7.6 | **4.8** |
| Propanol | 71-23-8 | 68 | 23 | 15 | 5 | **3.1** |
| Propyl acetate | 109-60-4 | 77 | 26 | 17 | 5.6 | **3.5** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Propylamine | 107-10-8 | 80 | 27 | 17 | 5.8 | **3.7** |
| Pyridine | 110-86-1 | 106 | 36 | 23 | 7.7 | **4.8** |
| Tetrachloroethane, 1,1,2,2- | 79-34-5 | 102 | 35 | 22 | 7.4 | **4.6** |
| Toluene | 108-88-3 | 92 | 31 | 20 | 6.7 | **4.2** |
| Trichloroethane, 1,1,2- | 79-00-5 | 70 | 24 | 15 | 5.1 | **3.2** |
| Trichloroethylene | 79-01-6 | 54 | 18 | 11 | 3.9 | **2.5** |
| Trichloropropane, 1,2,3- | 96-18-4 | 108 | 37 | 23 | 7.9 | **5** |
| Triethylamine | 121-44-8 | 72 | 24 | 15 | 5.2 | **3.3** |
| Trimethlypentane, 2,2,4- | 540-84-1 | 60 | 21 | 13 | 4.4 | **2.8** |
| Trimethylhexane, 2,2,5- | 3522-94-9 | 60 | 21 | 13 | 4.4 | **2.8** |
| Vinyl acetate | 108-05-4 | 54 | 18 | 11 | 3.9 | **2.5** |
| Vinyl chloride | 75-01-4 | 3.9 | 1.3 | 0.8 | 0.3 | **0.2** |
| Xylene, m- | 108-38-3 | 97 | 33 | 21 | 7 | **4.4** |

Bold print numbers represent experimental 1% breakthrough data points obtained in the 1970's adjusted for a medium work rate and the increased carbon volume and capacity of current

This data is applicable for ambient conditions at 22 oC, relative humidities from 0 to 65% and a medium work rate (25 LPM).

The other breakthrough times were calculated from Equation 2 taken from Nelson, G. O. and A. N. Correia, "Respirator Cartridge Efficiency Studies: VIII Summary and Conclusions"

Am. Ind. Hyg. Assoc. J. 37: 514 (1976).

These tests and calculations assume no safety factor.

For temperatures at 32 oC, multiply breakthrough times by 0.8.

For temperatures at 12 oC, multiply breakthrough times by 1.2.

For relative humidities between 65 and 80 %, multiply breakthrough times by 0.9.

For relative humidities between 80 and 95 %, multiply breakthrough times by 0.8.

For heavy work rates (35 LPM), multiply breakthrough times by 0.7.

For light work rates (15 LPM), multiply breakthrough times by 1.7.

These tests were performed under laboratory conditions and not under actual use conditions. Miller-Nelson Research Inc makes no warranties concerning protection by these air purifying respirator devices.

These are estimates and the user should determine the suitability of the devices under actual field conditions.

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