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# FLAME IONIZATION DETECTOR RESPONSE FACTORS

**(Updated: December 7, 2018)**

Listed below are the EPA formatted response factors (applicable to all FIDs doing M21 style inspections, such as: phx21, TVAs, and phx42):

| Stream Name | CAS | FID EPA |
|---|---|---|
| 1,1- DICHLOROETHYLENE | 75-35-4 | 1.23 |
| 1,1,1,2-TETRACHLOROETHANE | 630-20-6 | 1.07 |
| 1,1,1-TRICHLOROETHANE | 71-55-6 | 0.76 |
| 1,2-DICHLOROPROPANE | 78-87-5 | 0.56 |
| 1,3,-BUTADIENE | 106-99-0 | 0.73 |
| 1,4-DIOXANE | 123-91-1 | 1.43 |
| 1-BUTANOL | 71-36-3 | 0.81 |
| 1-BUTENE | 106-98-9 | 0.73 |
| 1-HEXANE | 110-54-3 | 0.41 |
| 1-HEXENE | 592-41-6 | 0.51 |
| 1-OCTENE | 111-66-0 | 0.31 |
| 2,2,4-TRIMETHYLPENTANE | 540-84-1 | 0.29 |
| 2-BUTANONE (MEK) | 78-93-3 | 0.67 |
| 2-CHLOROETHYL MERTHYL ETHER | 627-42-9 | 1.29 |
| 2-CHLOROTOLUENE | 95-49-8 | 0.4 |
| 2-ETHONXYETHANOL | 110-80-5 | 1.28 |
| 2-NITROPROPANE | 79-46-9 | 0.78 |
| 3-CHLOROPRENE (SLOW) | 107-05-1 | 0.85 |
| 3-DIETHYLAMINOPROPYLAMINE | 104-78-9 | 0.79 |
| 3-PICOLINE | 108-99-6 | 0.79 |
| ACETALDEHYDE | 75-07-0 | 1.99 |
| ACETIC ACID | 64-19-7 | 2.02 |
| ACETONE | 67-64-1 | 0.89 |
| Acetonitrile | 75-05-8 | 1.13 |
| ACETYLENE | 74-86-2 | 0.87 |
| ACRETALDEHYDE | | 1.99 |
| ACROLIEN | 107-02-8 | 1.3 |
| ACRYLIC ACID | 79-10-7 | 6.3 |
| ACRYLONITRILE | 107-13-1 | 0.85 |

| Stream Name | CAS | FID EPA |
|---|---|---|
| ALLYL ALCOHOL | 107-18-6 | 1.16 |
| alpha-METHYL STYRENE | 98-83-9 | 0.37 |
| AMYL ALCOHOL | 71-41-0 | 0.66 |
| ANILINE | 62-53-3 | 6.4 |
| ANISOLE | 100-66-3 | 1.02 |
| BENZENE | 71-43-2 | 0.34 |
| BENZONITRILE (SLOW) | 100-47-0 | 1.91 |
| BENZYL CHLORIDE | 100-44-7 | 0.52 |
| BROMOBENZENE (SLOW) | 108-86-1 | 0.88 |
| BROMOFORM | 75-25-2 | 6.72 |
| BUTYL ACETATE | 123-86-4 | 0.5 |
| BUTYL ACRYLATE | 141-32-2 | 0.57 |
| BUTYLALCOHOL (n-BUTANOL) | 71-36-3 | 0.83 |
| BUTYLAMINE | 109-73-9 | 7 |
| CARBON TETRACHLORIDE | 56-23-5 | 16.04 |
| CFC-113 | 76-13-1 | 0.72 |
| CFC-12 | 75-71-8 | 4.23 |
| CHLOROBENZENE | 108-90-7 | 0.34 |
| CHLOROFORM | 67-66-3 | 2.29 |
| CUMENE | 98-82-8 | 2.75 |
| CYCLOHEXANE | 110-82-7 | 0.45 |
| CYCLOHEXANOL | 108-93-0 | 1 |
| CYCLOHEXYLAMINE | 108-91-8 | 0.72 |
| DIACETONE ALCOHOL | 123-42-2 | 0.56 |
| DICHLOROETHYL ETHER | 111-44-4 | 1.03 |
| DIETHYL CARBONATE | 105-58-8 | 0.5 |
| DIETHYLMALEATE (@ 100 PPM) | 141-05-9 | 3.98 |
| DIMETHYL CARBONATE | 616-38-6 | 1.43 |
| DIMETHYL SULFATE | 77-78-1 | 4.76 |
| DIMETHYLFORMAMIDE | 68-12-2 | 1.7 |
| DODECANE (@ 100 PPM) | 112-40-3 | 2.05 |
| ENFLURANE | 13838-16-9 | 0.33 |
| EPICHLOROHYDRIN | 106-89-8 | 1.26 |
| ETHANE | 74-84-0 | 0.88 |
| ETHANOL | 64-17-5 | 1.62 |
| ETHYL ACETATE | 141-78-6 | 0.79 |

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| Stream Name | CAS | FID EPA |
|---|---|---|
| ETHYL ACRYLATE | 140-88-5 | 0.74 |
| ETHYL BENZENE | 100-41-4 | 0.33 |
| ETHYL CHLORIDE | 75-00-3 | 0.83 |
| ETHYL CHLOROFORMATE | 541-41-3 | 0.99 |
| ETHYL LACTATE | 97-64-3 | 0.86 |
| ETHYLAMINE | 75-04-7 | 1.42 |
| ETHYLENE | 74-85-1 | 1.31 |
| ETHYLENE DICHLORIDE | 107-06-2 | 0.84 |
| ETHYLENE OXIDE | 75-21-8 | 1.29 |
| FORMALDEHYDE (@ 10 PPM) | 50-00-0 | 9.76 |
| FREON 22 | 76-13-1 | 1.28 |
| HALOTHANE | 151-67-7 | 0.85 |
| HCF-134A | 811-97-2 | 0.3 |
| HCFC 123 | 306-83-2 | 0.98 |
| HCFC-141B | 1717-00-6 | 0.29 |
| HCFC-142B (MONOCHLORODIFLUOROETHANE) | 75-68-3 | 0.24 |
| HCFC-22 (MONOCHLORODIFLUOROMETHANE) | 75-45-6 | 0.73 |
| HEXANE | 110-54-3 | 0.4 |
| HFC-134A (1112-TETRAFLUOROETHANE) | 811-97-2 | 0.3 |
| HYDROGEN CYANIDE | 74-90-8 | 6.09 |
| IODOMETHANE | 74-88-4 | 2.95 |
| ISOBUTANE (2-METHYLPROPANE) | 75-28-5 | 0.54 |
| ISOBUTANOL | 78-83-1 | 0.93 |
| ISOBUTYL ALCOHOL (2-METHYL-1-PROPANOL) | 78-83-1 | 0.67 |
| ISOBUTYL CHLOROFORMATE | 543-27-1 | 0.47 |
| ISOBUTYLENE | 115-11-7 | 0.64 |
| ISOFLURANE | 26675-46-7 | 0.64 |
| ISOPHORONE (SLOW) | 78-59-1 | 3.46 |
| ISOPROPYL ACETATE | 108-21-4 | 0.64 |
| ISOPROPYL ALCOHOL | 67-63-0 | 0.94 |
| ISOPROPYL ETHER | 108-20-3 | 0.44 |
| M- CRESOL (100ppm) | 108-39-4 | 4.82 |
| METHANOL | 67-56-1 | 3.81 |
| METHYL ACETATE | 79-20-9 | 1.19 |
| METHYL BROMIDE | 74-83-9 | 1.78 |
| METHYL CELLOSOLVE | 109-86-4 | 2.82 |

| Stream Name | CAS | FID EPA |
|---|---|---|
| METHYL CHLORIDE | 74-87-3 | 1 |
| METHYL CHLOROFORMATE | 79-22-1 | 2.41 |
| METHYL METHACRYLATE | 80-62-6 | 0.59 |
| METHYL SALICYLATE (@ 100 PPM) | 119-36-8 | 2.17 |
| METHYL tert-BUTYLETHER | 1634-04-4 | 0.56 |
| METHYLAMINE | 74-89-5 | 2.76 |
| METHYLCYCLOHEXANE | 108-87-2 | 0.37 |
| METHYLENE CHLORIDE | 75-09-2 | 1.17 |
| MIBK, 4-METHYL-2-PENTANONE | 108-10-1 | 0.46 |
| n-BUTANE | 106-97-8 | 0.55 |
| n-DECANE | 124-18-5 | 0.45 |
| n-HEPTANE | 142-82-5 | 0.35 |
| n-HEXANE | 110-54-3 | 0.4 |
| NITROBENZENE | 98-95-3 | 4.6 |
| NITROETHANE | 79-24-3 | 1.06 |
| NITROMETHANE | 75-52-5 | 2.77 |
| n-METHYL PYRROLIDINONE (@ 10 PPM) | 872-50-4 | 3.05 |
| n-NONANE | 111-84-2 | 0.35 |
| n-OCTANE | 111-65-9 | 0.34 |
| n-OCTYL MERCAPTAN | 111-88-6 | 0.57 |
| n-PENTANE | 109-66-0 | 0.49 |
| OCTANE | 111-65-9 | 0.32 |
| PARACHLOROBENZOTRIFLUORIDE | 98-56-6 | 0.16 |
| PCBTF (DOW TEFLON BIPRODUCT) | 98-56-6 | 0.16 |
| PENTANE | 109-66-0 | 0.48 |
| per-ACETIC ACID | 79-21-0 | 2.63 |
| PGME - Propylene Glycol Monomethyl Ether | 107-98-2 | 0.84 |
| PGMEA - Propylene Glycol Monoethyl Ether Acetate | 108-65-6 | 0.55 |
| PIVALOYL CHLORIDE | 3282-30-2 | 0.42 |
| PROPANE | 74-98-6 | 0.61 |
| PROPANOL | 71-23-8 | 1.03 |
| PROPYL CHLOROFORMATE | 109-61-5 | 0.7 |
| PROPYLENE | 115-07-1 | 0.93 |
| PROPYLENE OXIDE | 75-56-9 | 0.92 |
| PYRIDINE | 110-86-1 | 1.06 |
| sec-BUTANOL | 78-92-2 | 0.61 |

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| Stream Name | CAS | FID EPA |
|---|---|---|
| STYRENE | 100-42-5 | 0.35 |
| SUVA COLD MP (HFC-134A) | 811-97-2 | 0.19 |
| tert-BUTYL METHYL ETHER | 1634-04-4 | 0.56 |
| tert-DODECANETHIOL | 25103-58-6 | 1.58 |
| tert-NONYL MERCAPTAN | 25360-10-5 | 0.67 |
| TETRACHLOROETHYLENE | 127-18-4 | 0.97 |
| TETRAHYDROFURAN | 109-99-9 | 1.17 |
| TOLUENE | 108-88-3 | 0.33 |
| trans-1,2-DICHLOROETHYLENE | 156-60-5 | 0.92 |
| TRICHLOROETHYLENE | 79-01-6 | 1.13 |
| TRIETHYLAMINE (SLOW) | 121-44-8 | 0.38 |
| TRIETHYLPHOSPHATE (@ 100 PPM) | 78-40-0 | 4.78 |
| UNDECANE (@ 100 PPM) | 1120-21-4 | 0.64 |
| VINYL ACETATE | 108-05-4 | 1.08 |
| VINYL BROMIDE | 593-60-2 | 1.79 |
| VINYL CHLORIDE | 75-01-4 | 1.22 |
| Vinylidene Fluoride | 75-38-7 | 1.13 |
| XYLENES | 1330-20-7 | 0.31 |

CAS = Chemical Abstracts Service registry number
FID EPA = flame ionization detector response factor formatted for Method 21.

Note: While some of these are provided by the referenced documents in Method 21, the "EPA" is short for EPA format response factor. There are 2 ways to describe response factor Relative Response factor (Measured response/ actual concentration) and Response Factor Multiplier (Actual concentration/Measured response). The EPA chose to standardize on the latter and it is now known by the industry as EPA Response Factor.
The list is a compilation of years and years of testing by us, our customers and agencies. It is mean to answer the question of "Will an FID see a leak of X material?".