



TECHNICAL NOTE

2020ComboPRO Response Factors

Table 1 Pre-set response factors

Compound	Code	RF
acetaldehyde	ACETAL	6.6
acetone	ACETONE	1.2
acrolein (2-propenal) ²	ACROLEIN	3.3
allyl chloride (3-chloro-1-propene) ²	ALLCHLOR	4.0
benzene	BENZENE	0.5
bromoform (tribromomethane) ²	BROMFORM	2.2
1-bromopropane	BROMPANE	0.4
1,3-butadiene	13BUTADI	0.8
<i>n</i> -butanol	nBUTANOL	3.1
<i>n</i> -butyl acetate	nBUTACET	2.2
<i>n</i> -butyl acrylate	nBUTACRY	1.8
<i>n</i> -butyl mercaptan (butanethiol) ³	nBUTMERC	0.6
carbon disulfide	CS2	1.3
chlorobenzene	CHLOBENZ	0.4
crotonaldehyde (2-butenal)	CROTONAL	1.2
cumene (isopropylbenzene)	CUMENE	0.6
cyclohexane	CYCHEXAN	1.3
cyclohexanone	CYCHEXON	0.9
1,2-dichlorobenzene (ortho-)	12DCBENZ	0.5
<i>cis</i> -1,2-dichloroethylene	cis12DCE	0.8
<i>trans</i> -1,2-dichloroethylene	trn12DCE	0.4
<i>n,n</i> -dimethylformamide (DMF)	N,N-DMF	0.8
1,4-dioxane	DIOXANE	1.3
epichlorohydrin ²	EPICLHYD	6.5

Table 1 Pre-set response factors (continued)

Compound	Code	RF
ethanol ¹	ETHANOL	8.8 (with 11.7 eV lamp)
ethyl acetate	ETHYACET	3.8
ethyl acrylate	ETHYACRY	2.3
ethylbenzene	ETBENZEN	0.5
ethyl cellosolve (2-ethoxyethanol)	ETHCELLO	1.3
ethyl ether (diethyl ether)	ETHETHER	1.2
ethyl mercaptan (ethanethiol) ³	ETHMERC	0.6
ethylene ⁴	ETHYLENE	10.1
<i>n</i> -heptane	nHEPTANE	2.4
<i>n</i> -hexane	nHEXANE	4.7
hydrogen sulfide	H2S	3.3
isoamyl acetate	IAMYACET	1.8
isobutyl acetate	IBUTACET	2.0
isobutyraldehyde ³	IBUTALDE	1.2
isopentane	IPENTANE	8.1
isoprene (2-methyl-1,3-butadiene) ⁵	ISOPRENE	0.6
isopropanol	IPA	3.8
isopropyl acetate	IPACETAT	2.6
isopropyl ether	IPROPETH	0.8
methyl bromide (bromomethane)	MeBROM	1.6
methyl ethyl ketone	MEK	0.8
methyl isobutyl ketone	MIBK	1.0
methyl mercaptan (methanethiol) ³	METHMERC	0.5
methyl methacrylate	MeMeACRY	1.4
methyl tert-butyl ether (MTBE)	MTBE	0.8
monomethylamine	MMeAMINE	1.3
<i>n</i> -nonane	nNONANE	1.4
<i>iso</i> -octane (2,2,4-trimethylpentane)	IOCTANE	1.2
<i>n</i> -pentane	nPENTANE	10.4
<i>n</i> -propanol	nPA	5.1
propionaldehyde (propanal) ²	PROPANAL	14.8
<i>n</i> -propyl acetate	nPROACET	3.1
propylene ⁴	PROPYLEN	1.2

Table 1 Pre-set response factors (continued)

Compound	Code	RF
propylene oxide	PROPOXID	5.8
styrene	STYRENE	0.4
tetrachloroethylene (PCE)	PCE	0.5
tetrahydrofuran	THF	1.5
toluene	TOLUENE	0.5
trichloroethylene	TCE	0.5
trimethylamine	TRMeAMIN	0.9
vinyl acetate	VINACET	1.2
vinyl bromide	VINBROM	0.4
vinyl chloride (chloroethylene)	VINCHLOR	1.7
vinylidene chloride (1,1-DCE)	1,1-DCE	0.8
<i>meta</i> -xylene	mXYLENE	0.5
<i>ortho</i> -xylene	oXYLENE	0.5
<i>para</i> -xylene	pXYLENE	0.5

Table 2 Additional response factors

Compound	RF
acetic anhydride	4.9
acetophenone	1.7
acrylonitrile ¹	5.8 (with 11.7 eV lamp)
ammonia	10.0
aniline	0.5
benzonitrile	0.5
benzylalcohol	1.0
biphenyl	3.2
1-bromopropane	1.9
1,3-butadiene	0.7
2-butenal	1.2
2-butoxyethylacetate	2.3
carbonyl sulfide ¹	4.8 (with 11.7 eV lamp)
chloroacetone	1.3
<i>p</i> -chloroaniline	1.3
cumol	0.6

Table 2 Additional response factors (continued)

Compound	RF
cyclohexamine	0.5
<i>n</i> -decane	1.1
1,2-diaminoethane	3.0
dibutyl ether	1.0
1,2-dichlorobenzene	0.5
1,1-dichloroethene	0.8
1,3-dichloropropane	0.8
<i>n,n</i> -diethylaniline	0.4
diethyl ether	1.2
1,1-difluoroethene	12.0
diisopropylether	0.8
<i>n,n</i> -dimethylacetamide	0.1
dimethyl disulfide	0.2
dimethyl ether	2.2
dimethyl sulfide	1.0
di- <i>n</i> -butylamine	0.7
1,2-epoxypropane (propylene oxide)	5.8
2-ethoxy-2-methylpropane	0.9
ethylbromide	4.8
ethylene glycol monoisopropyl ether	1.2
ethylene oxide	17
2-ethylhexylacrylate	1.8
4-ethyltoluene	0.5
furfural	1.0
2-heptanone	0.9
1-hexene	1.6
hydrazine	1.0
4-hydroxy-4-methyl-2-pentanone	0.6
iodomethane	0.9
iron pentacarbonyl	0.6
isobutene	1.0
isooctane	0.6
isopentylacetate	1.8

Table 2 Additional response factors (continued)

Compound	RF
<i>o</i> -cresol	0.8
<i>p</i> -cresol	2.1
methanol ¹	12.4 (with 11.7 eV lamp)
2-methoxyethanol	3.0
1-methoxypropylacetate	1.2
methyl acetate	5.5
methylamine	1.3
2-methylbutane	8.2
methylene chloride ¹	2.9 (with 11.7 eV lamp)
methyl isobutyl ketone	1.0
2-methylpentane	4.2
<i>n</i> -methyl pyrrolidone	1.4
naphthalene	0.2
nitrobenzene	1.7
3-nitrotoluene	1.6
<i>o</i> -nitrotoluene	1.5
<i>n</i> -octane	1.6
perchloroethylene (tetrachloroethylene)	0.5
phenol	0.4
phenylhydrazine	1.3
phosphine	3.4
alpha-pinene	0.4
2-propanol	4.4
2-propen-1-ol	2.7
tetraethyl lead	0.2
tetrahydrothiophene	0.5
thiophene	0.5
<i>o</i> -toluidine (1-amino-2-methylbenzene)	0.5
2,4-toluene diisocyanate	0.4
trichloromethane (chloroform) ¹	1.7 (with 11.7 eV lamp)
1,3,5-trimethylbenzene	0.3

The response factors were determined over the range 5 - 500 ppm, based on a 100 ppm isobutylene calibration. Isobutylene RF = 1.0. The following formula is used for calculation of response factors:

$$\text{Response Factor} = \frac{\text{Actual Concentration}}{\text{2020ComboPRO}}$$

A response factor less than 1.0 indicates a compound response better than that of isobutylene. A response factor greater than 1.0 indicates a lower response than that of isobutylene.

Presets simplify Memory Slot programming, and provide standard response factors and alarm levels for approximately 100 compounds. The name, response factor and three alarm levels are all set from the preset.

You can change any of the values entered in the Memory Slots. Changes made to the library information that has been loaded into a Preset will have no effect on the original library entry.

NOTE: Response factors are measured using a 10.6 eV lamp, except where specified that an 11.7 eV lamp was used.

NOTE: It does not matter which response factor is entered. The 2020ComboPRO response is not specific to any one compound. The displayed reading represents the total concentration of all ionizable compounds in the sample.

NOTES

- 1 Response factor for this compound using the 10.6 eV lamp is equal to 0.00 because the 11.7 eV lamp is required to ionize and detect this compound.
- 2 In cases where recommended exposure limits are below the detection limit for the compound in question, the estimated lower limit of detection has been substituted for those values.
- 3 The 2020ComboPRO is not suitable for monitoring these compounds at ACGIH recommended levels.
- 4 A 1000-ppm TWA has been established for those compounds which are "Simple Asphyxiants" and for which no exposure value exists.
- 5 For those compounds, which lack established exposure levels, an arbitrary value of 200 ppm has been established for the TWA, STEL and PEAK alarms.



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