

# Fike

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## Total Volatile Organic Compounds (TVOCs) in Air

Home <sup>(1)</sup>	Office <sup>(1)</sup>	
TVOC Level ng/L (µg/m <sup>3</sup> )	TVOC Level ng/L (µg/m <sup>3</sup> )	Meaning
Less than 200	Less than 200	Ideal
200-300	200-350	Good
300-400	350-500	Acceptable
400-500	500-700	Marginal
More than 500	More than 700	Actionable level; the higher the number, the worse the problem

Production/Manufacturing <sup>(1,2)</sup>	
TVOC Level ng/L (µg/m <sup>3</sup> )	Meaning
Less than 500	Ideal
500-700	Good
700-1000	Acceptable
1000-1500	Marginal
More than 1500	Actionable level; employee complaints probable; the higher the number, the worse the problem
1500-3000	Exposure effects <sup>(3)</sup> possible
3000-25000	Exposure effects <sup>(3)</sup> probable
More than 25000	Toxic range, potential neurological effects

Notes:

1. These levels are applicable to normal individuals; they are not applicable to chemically sensitive individuals.
2. Specific production operations may exceed these levels due to the presence of one or more compounds characteristic of a specific operation. In those cases, it is recommended that OSHA or NIOSH limits be used for those individual compounds and that they not be included in the Total VOC value.
3. Exposure effects – eye and respiratory irritation, headaches, drowsiness, nausea, general malaise, etc.

$$TVOC = [(As - Ab) \times Ws / Ai] / Ls$$

Where: As = C3-C15 TIC (Total Ion Chromatogram) area of the Sample  
 Ab = C3-C15 TIC area of the blank  
 Ws = Weight of the internal standard added in ng  
 Ai = TIC area of the internal standard peak  
 Ls = Volume of the sample in L

*The levels listed in this table and the potential reactions described are based on work done by L. Molhave, (Volatile Organic Compounds, Indoor Air Quality and Health, Vol. 5, International Indoor Air Quality Conference, Toronto, Canada, 1990, p. 22 ff) and others as well as empirical information gained through interactions with many professionals who are active in the IAQ field. These levels should not, in any way, be construed as definitive. Liability for reliance on the data contained in the above tables is therefore disclaimed*

*This table was first published in the technical paper Fike, R. S., "VOCs," Indoor Environment Connections, Vol. 8, Issue 10, August, 2007, p. 37 ff.*