Gas Concentration: % LEL, % Volume and ppm

Convert a flammable gas concentration between percent of the lower explosive limit, percent by volume and ppm, from the gas's LEL.

Method: Definition: % LEL = concentration / LEL

Input parameters

Unit system: SI

Parameter	Value	Unit
Lower explosive limit of the gas (by volume) From the gas's safety data sheet or a recognised table (methane is about 4.4 % in IEC 60079-20-1, 5 % in older tables).	4.4000	%
Gas concentration by volume	1.1000	%

Calculated results

Parameter	Value	Unit
Concentration as a share of the LEL	25.000	%
Concentration in ppm	11,000	
Concentration at 20 % LEL	0.88000	%

Notes for this case

- Above 20 % LEL, the usual first alarm level.
- Catalytic and infrared detectors are calibrated for one gas; other gases need the maker's cross-sensitivity factor.

Formula and method

$$\%LEL = \frac{x}{LEL}, \quad c\,[\text{ppm}] = 10^6 x$$

Variables

LEL	Lower explosive limit of the gas (by volume)	-
x	Gas concentration by volume	-
$\%LEL$	Concentration as a share of the LEL	-
c	Concentration in ppm	-
x_{20}	Concentration at 20 % LEL	-

Method and standards

Definitions.

Assumptions and limits

- Single gas in air. Readings at or above 20 % LEL and at or above 100 % LEL are flagged.

References

- Definition: % LEL = concentration / LEL

Report details

Report reference	FCC-HM44-EXPW (the same inputs always give the same reference)
Generated	17 November 2026, 19:46 UTC
Calculator	Gas Concentration: % LEL, % Volume and ppm
Method last reviewed	12 November 2026
Software release	FireCAD Calc, release of 17 November 2026
Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/instrumentation/analysers/gas-detector-lel

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.