IAQ Criteria

	parameter	Green	Yellow	Orange	Red
T = quality of thermal environment	temperature (heating)	21-23°C	20-24°C	19-25°C	<19 or >25°C
	temperature (cooling)	23.5-25.5°C	23-26°C	22-27°C	<22 or >27°C
	OHCOW temp*	23.3-24.3°C	22-25°C	21-26°C	<21 or >26°C
A = quality of acoustic environment	noise (small office)	≤30 dBA	≤35 dBA	≤40 dBA	>40 dBA
	noise (open office)	≤35 dBA	≤40 dBA	≤45 dBA	>45 dBA
	COPE (2003)	42-48 dBA for open plan offices (background & foreground noise)			
	ASHRAE (NC/RC dBA_{eq})	*≤35 dBA for small offices ≤45 dBA for open plan offices*			
I = quality of indoor air	CO_2 *(misprint?)*	*≤550 ppm above background*	*≤800 ppm above background*	*≤1350 ppm above background*	*>1350 ppm above background*
	MOL CO_2 (1983)**	<270 ppm above background	≤470 ppm above background	≤670 ppm above background	>670 ppm above background
	1983 background 330 ppm	<600 ppm	<800 ppm	<1000 ppm	1000+
	2022 background 420 ppm	<700 ppm	<900 ppm	<1100 ppm	1100+
	TAIL outdoor air (OA) supply	≥10 L/s/p + 2.0 L/s/m^2	≥7 L/s/p + 1.4 L/s/m^2	≥4 L/s/p + 0.8 L/s/m^2	<4 L/s/p + 0.8 L/s/m^2
		≥21 cfm/p + 0.4 cfm/ft^2	≥15 cfm/p + 0.28 cfm/ft^2	≥8.5 cfm/p + 0.16 cfm/ft^2	<8.5 cfm/p + 0.16 cfm/ft^2
	OA supply (ASHRAE 62.1) "comfort"	recommended **minimum** OA supply (with default occupancy density): offices: 2.5 L/s/p + 0.3 L/s/m^2; classrooms: 5 L/s/p + 0.6 L/s/m^2			
		recommended **minimum** OA supply (with default occupancy density): offices: 5 cfm/p + 0.06 cfm/ft^2; classrooms: 10 cfm/p + 0.12 cfm/ft^2			
	OA supply (ASHRAE 241) "infection prevention"	recommended OA supply: offices: 15 L/s/p; classrooms: 20 L/s/p			
		recommended OA supply: offices: 30 cfm/p; classrooms: 40 cfm/p			
	OA supply (NADR) infection control	≥14 L/s/p + 7.1 L/s/m^2	14 L/s/p + 7.1 L/s/m^2	10 L/s/p + 5.8 L/s/m^2	<10 L/s/p + 5.8 L/s/m^2
		≥30 cfm/p + 1.4 cfm/ft^2	30 cfm/p + 1.4 cfm/ft^2	21 cfm/p + 1.15 cfm/ft^2	<21 cfm/p + 1.15 cfm/ft^2
		>6 ACHeq	6 ACHeq	4 ACHeq	<4 ACHeq
	Relative Humidity	30-50%	25-60%	20-70%	<20% or >70%
	Verheyen & Bourouiba#	40-60%	35-65%	30-70%	<30%* or >70% (*lower if condensation on windows)
	visible mold	no visible mould	Minor moisture damage, minor areas with visible mould (<400 cm^2)	Damaged interior structural component, larger areas with visible mould (≤2500 cm^2)	Large areas with visible mould (≥2500 cm^2)
	NIOSH Dampness & Mold Assessment Tool	no **visible mold**, water **damage or stains**, **wet or damp** building materials	**visible mold/damage or stains/wet or damp** area ≤ the size of a sheet of paper [≤600 cm^2]	**visible mold/damage or stains/wet or damp area** > than a sheet of paper to the size of a standard door [600-15,000 cm^2]	**visible mold/damage or stains/wet or damp** area > than the size of a standard door [15,000 cm^2 or 1.5 m^2]
	Health Canada*** VOCs	≤0.3 mg/m^3	≤3 mg/m^3	≤25 mg/m^3	>25 mg/m^3
		≤90 ppb (as isobutylene)	≤1300 ppb	≤11 ppm	>11 ppm
	benzene*	≤2 µg/m^3	≤5 µg/m^3		>5 µg/m^3
	formaldehyde*	≤30 µg/m^3	≤100 µg/m^3		>100 µg/m^3
	$PM_{2.5}$	≤10 µg/m^3	≤25 µg/m^3		>25 µg/m^3
	CAAQS**** 24-hr $PM_{2.5}$	≤10 µg/m^3	≤19 µg/m^3	≤27 µg/m^3	>27 µg/m^3
	CO ##	≤2 ppm	≤5 ppm	≤9 ppm	>9 ppm
	radon	≤100 Bq/m^3	≤300 Bq/m^3		>300 Bq/m^3
L = quality of lighting	lighting (% of time between 300-500 lux)	60-100%	40-60%	10-40%	<10%
	CSA: 75-300 lux for computer work; 200-500 lux for both computer & reading (% of time)	80%	70%	60%	50%

* these are based on field data collected by OHCOW (applicable to heating & cooling seasons)

** these are added items from the Rajhans paper converted to above background (1983 = 330 ppm CO_2)

*** Health Canada (1995) - IAQ in Office Buildings- A Technical Guide https://publications.gc.ca/collections/Collection/H46-2-93-166Erev.pdf

**** CAAQS $PM_{2.5}$ management levels https://ccme.ca/en/air-quality-report#slide-9

Verheyen & Bourouiba (Nov 16 2022) "Associations between indoor relative humidity and global COVID-19 outcomes' https://royalsocietypublishing.org/doi/full/10.1098/rsif.2021.0865

combination of WHO and field practice looking for combustion exhaust sources

* usually part of VOCs unless their individual presence is suspected (fuel spill, UFFI, etc.)

extracted from: Wargocki et al (2021), "TAIL, a new scheme for rating indoor environmental quality in offices and hotels undergoing deep energy renovation (EU ALDREN project)", Energy & Buildings 244 (2021) 111029