Green wall technology for the phytoremediation of indoor air: a system for the reduction of high CO_2 concentrations (2018)

Light compensation points for the tested plant species in 150-mm pots and 15.0-L chambers. The compensation point is the light level at which the potted plant neither produces nor consumes net CO_2

Species	Common name	Compensation point light level (μmol m^{-2} s^{-1} (lx))
Neomarica sp.	Walking iris	15 (700)
Philodendron xanadu	Xanadu	14 (650)
Peperomia sp.	Large Leaf Peperomia	13 (600)
Peperomia sp.	Small Leaf Peperomia	13 (600)
Gibasis sp.	Tahitian Bridal Veil	10 (460)
Epipremnum aureum	Golden pothos	10 (460)
Chlorophytum comosum	Spider plant	10 (460)

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Net effective CO_2 removal from a sealed room by four modules containing two different plant species, at two different light intensities and with module impellers off and running at full output (3.5 m s^{-1})

Plant cultivar	Light level (μmol m^{-2} s^{-1})	Fan speed (m s^{-1})	Volume of CO_2 removed (mL h^{-1})	Mass CO_2 removed (g h^{-1})	CADR (m^3 m^{-2} green wall h^{-2})	ACH (m^{-2} green wall)
Chlorophytum	50	0	2418	4.43	0.21	0.014
	50	3.5	2221	4.07	0.26	0.017
	250	0	2688	4.92	0.31	0.020
	250	3.5	2999	5.49	0.33	0.021
Epipremnum	50	0	194	0.35	0.19	0.012
	50	3.5	351	0.64	0.16	0.011
	250	0	232	0.43	0.23	0.015
	250	3.5	745	1.36	0.31	0.020

Assessment of filtration efficiency and physiological responses of selected plant species to indoor air pollutants (toluene and 2-ethylhexanol) under chamber conditions(2018)

Removal rate constant for 2-ethylhexanol and toluene in experiments with Dieffenbachia maculata, Spathiphyllum wallisii, and Asparagus densiflorus under different light conditions (light/ dark). Values are means ± SD (n = 4) after 48 h of VOC exposure

	Plant species	Removal rate constant [L h^{-1} m^{-2} leaf area]		
		Light	Dark	
2-Ethylhexanol	D. maculata	1.8 ± 0.2	1.4	± 0.1*
	S. wallisii	2.4 ± 0.2	1.9	± 0.2*
	A. densiflorus	2.0 ± 1.1	1.7	± 1.0
	Significance among species	n.s.	n.s.	
Toluene	D. maculata	5.6 ± 1.8	5.5	± 1.2
	S. wallisii	5.7 ± 1.5	4.0	± 0.8
	A. densiflorus	4.0 ± 2.1	3.4	± 2.0
	Significance among species	n.s.	n.s.	

Asterisks indicate significant differences between light conditions within plant species and VOC identity ($p \leq 0.05$, one-way ANOVA, followed Tukey's HSD test)
n.s. not significant

Source: https://link.springer.com/article/10.1007/s11356-017-0453-9

Phytoremediation of VOCs from indoor air by ornamental potted plants: A pilot study using a palm species under the controlled environment (2018)

Average reduction of formaldehyde vapors achieved by air and root part of Chamaedorea elegans with and without combined chamber losses

	Inlet	With combined chamber losses			Without combined chamber			Leaf
						losses		surface
Type of test	concentration	C out	Whole RE	Whole EC	C out	Net	Net EC	
								area

	(mg/m³)					RE		(m²)
		(mg/m³)	(%)	(mg/m2.h)	(mg/m ³)	(%)	(mg/m². h)	
Chamber								
loss at 40%	6.37 ±0.13	5.92 ±0.22	7.06 ±1.72	-	5.92	7.06	-	-
RH								
Chamber								
loss at 80%	6.71 ±0.02	5.69 ±0.09	15.20 ±0.97	-	5.69	15.20	-	-
RH								
	0.66 ±0.04	0.00±00	100.00 ±00	0.11 ±0.04	0.10	84.80	0.10	2.43
	0.97 ±0.04	0.12± 0.02	87.63 ±1.17	0.15 ±0.03	0.27	72.43	0.12	2.43
	1.63 ±0.05	0.26± 0.03	84.05 ±1.57	0.24 ±0.04	0.51	68.85	0.19	2.43
Average	2.68 ±0.02	0.46± 0.03	82.84 ±1.06	0.38 ±0.01	0.87	67.63	0.31	2.43
	4.97 ±0.03	0.81± 0.05	83.70 ±0.88	0.72 ±0.02	1.57	68.50	0.59	2.43
entire plant	7.13 ±0.03	1.32± 0.06	81.49 ±0.72	1.00 ±0.04	2.40	66.29	0.82	2.43
	11.72 ±0.06	2.61± 0.09	77.73 ±0.66	1.57 ±0.03	4.39	62.53	1.27	2.43
	14.58 ±0.05	3.88± 0.06	73.39 ±0.30	1.85 ±0.03	6.10	58.19	1.47	2.43
	16.37 ±0.07	5.77± 0.05	64.75 ±0.14	1.83 ±0.03	8.26	49.55	1.40	2.43
Effect of darkness	7.13 ±0.03	1.86 ±0.11	73.91 ±1.48	0.91 ±0.01	2.94	58.71	0.72	2.43
Root zone, pot & soil	8.72 ±0.10	4.84 ±0.07	44.50 ±0.13	12.16 ±0.10	6.17	29.29	8.02	0.134*

Source: https://doi.org/10.1016/j.chemosphere.2018.01.078

Correlation Between Plant Physiology and CO_2 Removable (2017)

All the results of CO_2 reduction by plants species at four conditions

Type of Plants	Percentage of CO_2 Reduction (%)			
	300 lux & 450±5 ppm of CO_2	700 lux & 450±5 ppm of CO_2	300 lux & 1000±5 ppm of CO_2	700 lux & 1000±5 ppm of CO_2
Anthurium	0.62	8.26	2.2	10.8
Dumb Cane	6.38	12.72	5.5	11.10
Golden Pothos	6.67	11.81	6.10	10.3
Kadaka Fern	5.86	12.67	6.50	12.48
Prayer Plant	7.68	14.88	7.0	14.80
Spider Plant	-1.44	-1.13	-0.2	0.1
Syngonium	4.08	10.56	6.72	10.08

Physiology parameter for each type of plants

Type of Plants	Physiology Parameter		
	Leaf Area (m^2)	Fresh Weight (g)	Dry Weight (g)
Anthurium	0.1072±0.008	104.089±9.543	22.488±1.306
Dumb Cane	0.1441±0.007	123.594±11.981	16.991±2.298
Golden Pothos	0.1273±0.009	248.435±13.987	68.078±1.817
Kadaka Fern	0.1469±0.008	132.708±10.192	20.927±3.471
Prayer Plant	0.1817±0.004	106.545±7.871	13.478±1.025
Spider Plant	0.0771±0.005	56.221±8.086	7.353±1.615
Syngonium	0.0601±0.003	65.119±6.580	15.044±2.639

Correlation between physiology parameter of plants and condition of light intensity and CO_2 concentration

Physiology Parameter	CO_2 removable at four conditions (Pearson Correlation)			
	300 lux & 450±10 ppm of CO_2	700 lux & 450±10 ppm of CO_2	300 lux & 1000±10 ppm of CO_2	700 lux & 1000±10 ppm of CO_2
Leaf Area	0.763	0.687	0.526	0.686
Fresh Weight	0.487	0.411	0.422	0.325
Dry Weight	0.284	0.235	0.294	0.164