Room Index and Cavity Ratios for Lighting Design

Room index and the room, ceiling and floor cavity ratios of a rectangular room from its length, width and the cavity heights, for utilisation factor tables.

Method: Room index and zonal-cavity ratios; Lighting Handbook practice (lumen method, maintenance factor components)

Input parameters

Unit system: SI

Parameter	Value	Unit
Room length	12.000	m
Room width	8.0000	m
Luminaire height above the working plane	2.2000	m
Ceiling cavity depth (suspension)	0.50000	m
Working plane height above floor	0.80000	m

Calculated results

Parameter	Value	Unit
Room index	2.1818	
Room cavity ratio	2.2917	
Ceiling cavity ratio	0.52083	
Floor cavity ratio	0.83333	

Notes for this case

• k = LW/(h_m(L + W)), used with utilisation factor tables; cavity ratios = 5h(L + W)/(LW) for the zonal-cavity method (RCR = 5/k). Small or tall rooms have low k and lose more light to the walls.

Formula and method

$$k = \frac{LW}{h_m(L+W)}, \quad CR = \frac{5h(L+W)}{LW}$$

Variables

L	Room length	m
W	Room width	m
h_m	Luminaire height above the working plane	m
h_c	Ceiling cavity depth (suspension)	m
h_f	Working plane height above floor	m
k	Room index	-
RCR	Room cavity ratio	-
CCR	Ceiling cavity ratio	-
FCR	Floor cavity ratio	-

Method and standards

Room index.

Assumptions and limits

- Rectangular room.

References

Room index and zonal-cavity ratios, Lighting Handbook practice (lumen method, maintenance factor components)

Report details

Report reference	FCC-6ZN6-TNXY (the same inputs always give the same reference)
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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/electrical/lighting/room-index-cavity-ratios

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.