



Calculated results - ElumTools® vs AGi32®

ElumTools® and AGi32® utilize the same radiosity-based calculation engine and will generally produce close to identical results. Very small differences can arise as surface meshing (including adaptive subdivision) settings can be slightly different due to program defaults and the way physical geometry is created in the two programs.

Lighting Analysts runs several benchmarks prior to each major release of both programs to compare results. This article contains results from two of those test cases:

- 1.) Room containing a single recessed luminaire with only a direct light component.
- 2.) Room containing a single suspended luminaire with both direct and indirect light components.

Calculation notes:

1. ElumTools has adaptive subdivision enabled by default, in AGi32 it is disabled. Adaptive subdivision has been disabled in ElumTools for this example to ensure a more accurate comparison. If the ElumTools files are recalculated without disabling adaptive subdivision (in Settings) the results will not match this paper. Users are encouraged to enable adaptive subdivision in both programs, recompute and compare on your own.
2. AGi32 provides two slightly different calculation techniques when placing calculation points: the Exitance meter (EM) and Virtual meter (VM). AGi32's Automatic placement command will place points on surfaces (not work planes) using the Exitance meter method as the results can be interpolated from the radiosity mesh very quickly. This method is dependent on the radiosity meshing parameters. Virtual meter points are not dependent on the radiosity mesh and can be considered more accurate although the differences are typically very small. Virtual meter calculations are slightly slower. ElumTools uses only the Virtual meter method. In AGi32, both Exitance meter points (Label=Room_1_Floor) and Virtual meter points (Label=CalcPts_1) are included in the files. You can swap visibility using Project Manager.
3. Tabular results have been rounded to the nearest lux which would be typical of interior lighting calculations.

This paper describes only illuminance results. Several other metrics are also calculated: Luminous exitance (floor), Diffuse luminance (floor), and in the case of the recessed (direct) luminaire, Unified Glare Rating (UGR). These can be seen by examining the respective files.

Summary of Illuminance Results (lux):

Direct light luminaire (lux)					
	AGi32 v20 EM	AGi32 v20 VM	ElumTools 2021	Difference EM	Difference VM
Average	84	84	84	-	-
Maximum	144	144	144	-	-
Minimum	39	39	39	-	-

Direct + Indirect light luminaire (lux)					
	AGi32 v20 EM	AGi32 v20 VM	ElumTools 2021	Difference EM	Difference VM
Average	121	127	125	3.25%	1.59%
Maximum	227	234	232	2.18%	0.86%
Minimum	57	58	57	-	1.74%

Direct light component luminaire

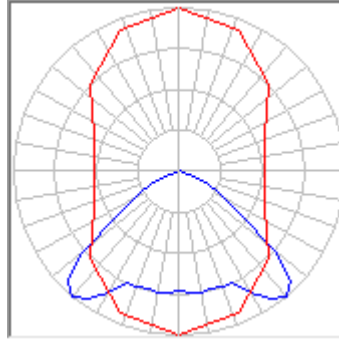
Room size: 20' x 10' x 8'

Workplane height: 0' (on floor)

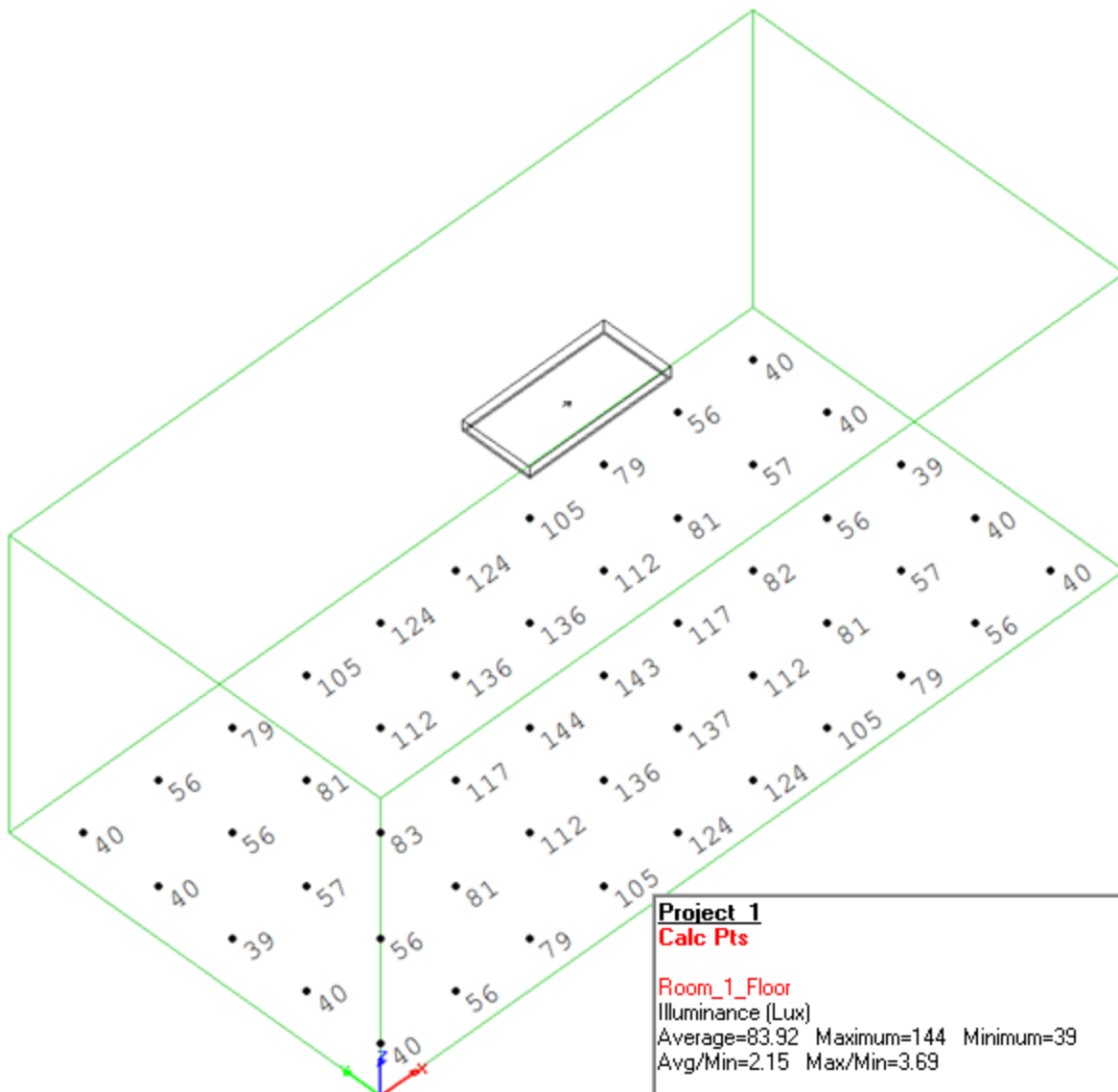
Reflectances: 80% ceiling, 50% walls, 20% floor

Point spacing: 2' x 2'

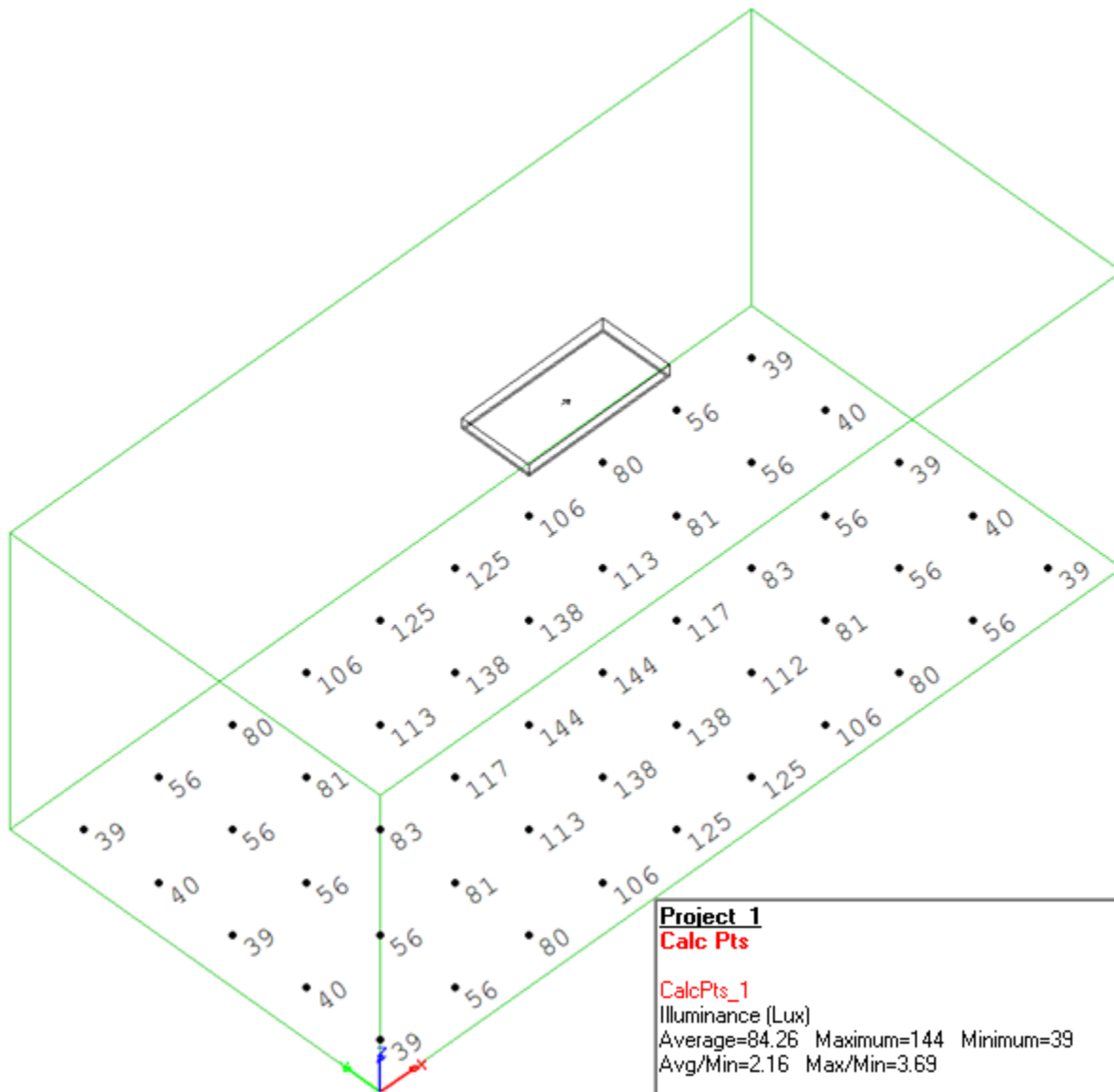
Luminaire: Room center, recessed.



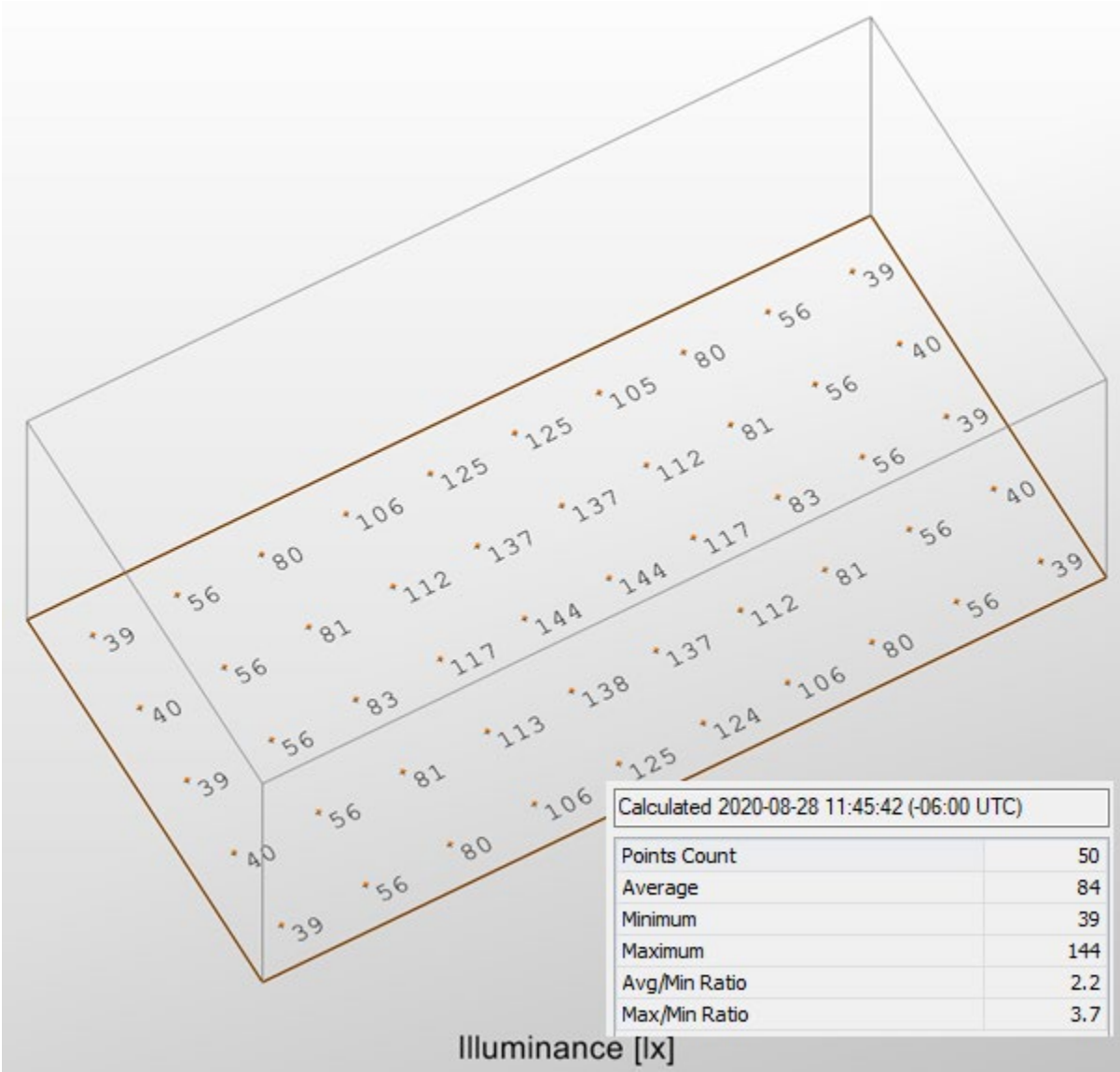
AGi32 EM Results: Illuminance (lux)



AGi32 VM Results: Illuminance (lux)



ElumTools Results: Illuminance (lux)



Direct + Indirect light luminaire

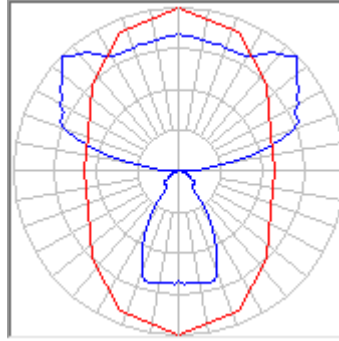
Room size: 20' x 10' x 10'

Workplane height: 0' (on floor)

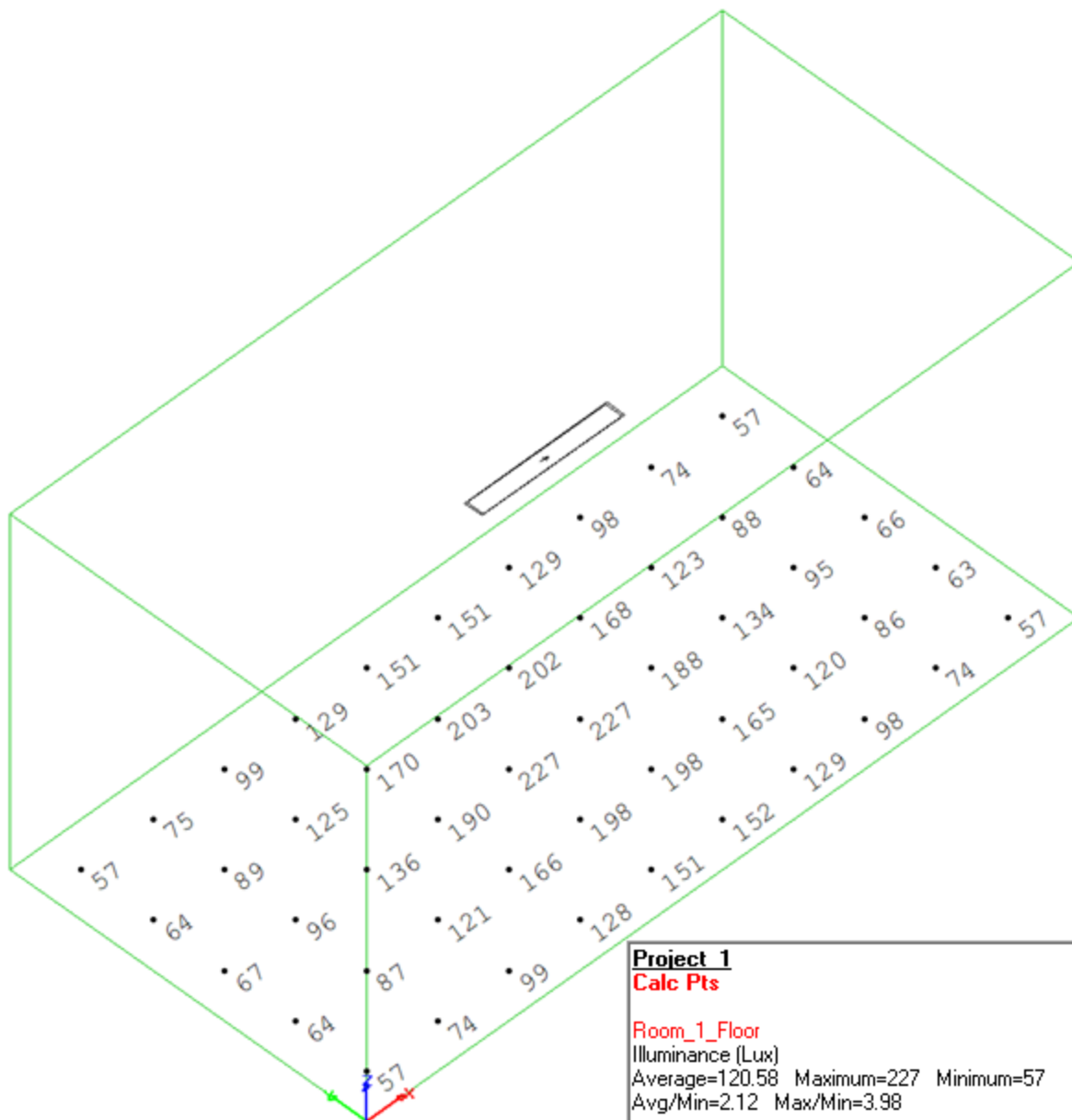
Reflectances: 80% ceiling, 50% walls, 20% floor

Point spacing: 2' x 2'

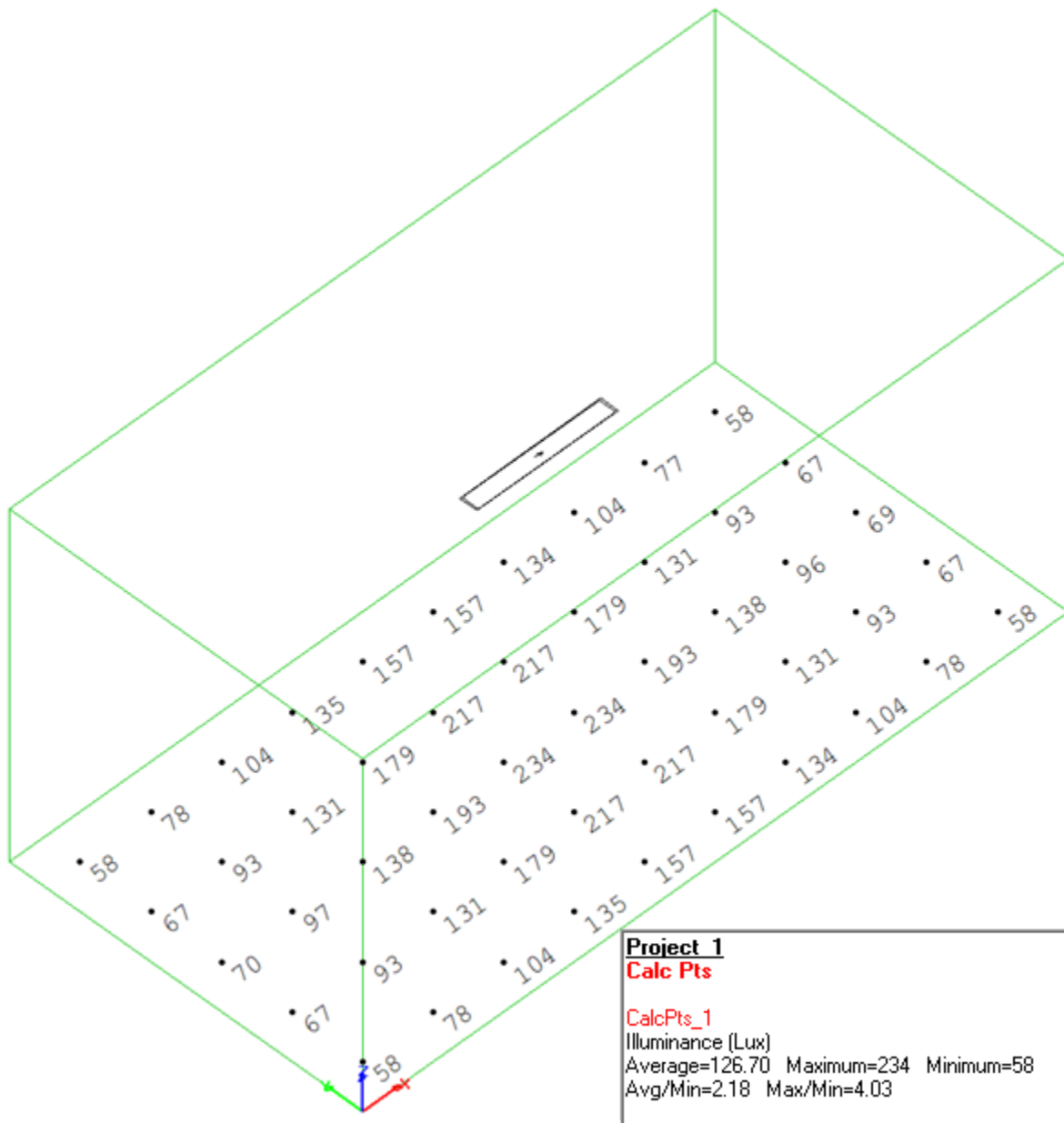
Luminaire: Room center, 8' mounting height.



AGi32 EM Results: Illuminance (lux)



AGi32 VM Results: Illuminance (lux)



ElumTools Results: Illuminance (lux)

