

## Calculating Weight/Square Foot ◀ ▶ My Opinion

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**Q:** We have an order to supply 24" x 24" x 3/4" thick limestone tiles for a new construction project. The engineer designing the floor truss system wants to know what the weight of the stone tiles will be per square foot. I have test data for the stone that says it weighs 152 pounds per cubic foot. How do I calculate the weight per square foot?

**A:** I'm glad to hear that they are actually designing the floor system with the deadload of the stone in mind. Floor finishes are often not selected prior to the structural design phase, and problems occur as a result of not designing the floor system to accommodate the stone.

The conversion from "density" (lbs/ft<sup>3</sup>) to "mass per unit area" (lbs/ft<sup>2</sup>) is simple: take the density in lbs/ft<sup>3</sup>, multiply by the thickness in inches, and divide by 12. In your case, this would be  $152 \times 0.75 \div 12 = 9.5$  lbs/ft<sup>2</sup>. This is the stone only, so remind the engineer to allow for the weight of the thinset and any other installation components.

Despite the fact that this is very simple math, I get this question so frequently that I developed an Excel spreadsheet for it so I can email it to callers. A hard copy is shown to the upper right.

**Q:** We purchased a light colored, flame finished granite. We accidentally spilled some hydraulic fluid on it. We've poulticed it three times and it hasn't improved at all. Is this a hopeless case?

**A:** Oil stains usually come out with

		Weight of Stone Slabs (lbs/sqft)								
		Stone Density (lbs/ft <sup>3</sup> )								
		120	130	140	150	160	170	180	190	200
<b>Slab Thickness (in)</b>	3/8	3.8	4.1	4.4	4.7	5.0	5.3	5.6	5.9	6.3
	1/2	5.0	5.4	5.8	6.3	6.7	7.1	7.5	7.9	8.3
	5/8	6.3	6.8	7.3	7.8	8.3	8.9	9.4	9.9	10.4
	3/4	7.5	8.1	8.8	9.4	10.0	10.6	11.3	11.9	12.5
	7/8	8.8	9.5	10.2	10.9	11.7	12.4	13.1	13.9	14.6
	1	10.0	10.8	11.7	12.5	13.3	14.2	15.0	15.8	16.7
	1 1/8	11.3	12.2	13.1	14.1	15.0	15.9	16.9	17.8	18.8
	1 1/4	12.5	13.5	14.6	15.6	16.7	17.7	18.8	19.8	20.8
	1 1/2	15.0	16.3	17.5	18.8	20.0	21.3	22.5	23.8	25.0
	1 3/4	17.5	19.0	20.4	21.9	23.3	24.8	26.3	27.7	29.2
	2	20.0	21.7	23.3	25.0	26.7	28.3	30.0	31.7	33.3
	3	30.0	32.5	35.0	37.5	40.0	42.5	45.0	47.5	50.0
4	40.0	43.3	46.7	50.0	53.3	56.7	60.0	63.3	66.7	

relative ease, but not if you're using a water-based poultice. Since water and oil don't mix, it will be ineffective in drawing out the oil. Try using the poultice powder again, but mix it with a solvent (either mineral spirits or acetone usually work well) instead of water. You may need several attempts to fully eradicate the stain, but you'll usually win in the end.

**Q:** I'm working with an architect that is specifying a travertine stone panel for an interior wall cladding. The panels are roughly 4'-0" wide x 2'-0" high. She wants to know how thick they need to be and wants to use strap anchors. Will 3/4" thick-

ness work for this?

**A:** A thickness of 3/4" (20 mm) will likely be adequate, except for the fact that it won't accommodate the strap anchors. Strap anchors usually don't work well in 20 mm stone panels, because after one cuts the slot prep in the stone to receive the anchor, there isn't adequate stone left to provide much strength. A pin or wire anchor will normally have higher strengths in this thickness because they require less stone mass removed to accommodate the anchor. They also have the advantage of being easier to cut in the field if required.