



A p p e n d i x I V





Room Criteria (RC) Table

Type of Room - Space Type	Recommended RC Level RC Curve	Equivalent Sound Level dBA
Apartments	25-35 (N) ¹⁾	35-45
Assembly Halls	25-30 (N)	35-40
Churches	30-35 (N)	40-45
Courtrooms	30-40 (N)	40-50
Factories	40-65 (N)	50-75
Hotels/Motels		
- Individual rooms or suites	30-35 (N)	35-45
- Meeting or banquet rooms	25-35 (N)	35-45
- Service and Support Areas	40-45 (N)	45-50
- Halls, corridors, lobbies	35-40 (N)	50-55
Offices		
- Conference rooms	25-30 (N)	35-40
- Private	30-35 (N)	40-45
- Open-plan areas	35-40 (N)	45-50
Hospitals and Clinics		
- Private rooms	25-30 (N)	35-40
- Operating rooms	25-30 (N)	35-40
- Wards	30-35 (N)	40-45
- Laboratories	35-40 (N)	45-50
- Corridors	30-35 (N)	40-45
- Public areas	35-40 (N)	45-50
Schools		
- Lecture and classrooms	25-30 (N)	35-40
- Open-plan classrooms	30-40 (N)	45-50
Movie motion picture theaters	30-35 (N)	40-45
Libraries	35-40 (N)	40-50
Legitimate theaters	20-25 (N)	30-65
Private Residences	25-35 (N)	35-45
Restaurants	40-45 (N)	50-55
TV Broadcast studios	15-25 (N)	25-35
Recording Studios	15-20 (N)	25-30
Concert and recital halls	15-20 (N)	25-30
Sport Coliseums	45-55 (N)	55-65



Type of Room - Occupancy		Noise Criterion - NC -	db(A)
Very quiet	Concert and opera halls, recording studios, theaters, etc.	10 - 20	25 - 30
	Private bedrooms, live theaters, television and radio studios, conference and lecture rooms, cathedrals and large churches, libraries, etc.	20 - 25	25 - 30
	Private living rooms, board rooms, conference and lecture rooms, hotel bedrooms	30 - 40	30 - 35
Quiet	Public rooms in hotels, small offices classrooms, courtrooms	30 - 40	40 - 45
Moderate noisy	Drawing offices, toilets, bathrooms, reception areas, lobbies, corridors, department stores, etc.	35 - 45	45 - 55
Noisy	Kitchens in hospitals and hotels, laundry rooms, computer rooms, canteens, supermarkets, office landscape, etc.	40 - 50	45 - 55

Absorption per frequency

Freequency = 125					
Surface area (ft ²)			•	a	
Walls	2(24 ft x 9 ft) =	432	0.10	43.2	
	2(28 ft x 9 ft) =	432	0.10	43.2	
Ceiling	(28 ft x 24 ft) =	672	0.01	6.72	
Floor	(28 ft x 24 ft) =	672	0.02	13.44	
			a_{Total} =	106.56	sabins
Freequency = 250					
Surface area (ft ²)			•	a	
Walls	2(24 ft x 9 ft) =	432	0.05	21.6	
	2(28 ft x 9 ft) =	432	0.05	21.6	
Ceiling	(28 ft x 24 ft) =	672	0.01	6.72	
Floor	(28 ft x 24 ft) =	672	0.03	20.16	
			a_{Total} =	70.08	sabins
Freequency = 500					
Surface area (ft ²)			•	a	



Walls	2(24 ft x 9 ft) =	432	0.06	25.92	
	2(28 ft x 9 ft) =	432	0.06	25.92	
Ceiling	(28 ft x 24 ft) =	672	0.02	13.44	
Floor	(28 ft x 24 ft) =	672	0.03	20.16	
			a_{Total} =	85.44	sabins
Freequency = 1000					
Surface area (ft²)			•	a	
Walls	2(24 ft x 9 ft) =	432	0.07	30.24	
	2(28 ft x 9 ft) =	432	0.07	30.24	
Ceiling	(28 ft x 24 ft) =	672	0.02	13.44	
Floor	(28 ft x 24 ft) =	672	0.03	20.16	
			a_{Total} =	94.08	sabins
Freequency = 2000					
Surface area (ft²)			•	a	
Walls	2(24 ft x 9 ft) =	432	0.09	38.88	
	2(28 ft x 9 ft) =	432	0.09	38.88	
Ceiling	(28 ft x 24 ft) =	672	0.02	13.44	
Floor	(28 ft x 24 ft) =	672	0.03	20.16	
			a_{Total} =	111.36	sabins
Freequency = 4000					
Surface area (ft²)			•	a	
Walls	2(24 ft x 9 ft) =	432	0.08	34.56	
	2(28 ft x 9 ft) =	432	0.08	34.56	
Ceiling	(28 ft x 24 ft) =	672	0.02	13.44	
Floor	(28 ft x 24 ft) =	672	0.02	13.44	
			a_{Total} =	96	sabins

TL DATA FOR COMMON BUILDING ELEMENTS*

Building Construction	Transmission Loss (dB)						STC Rating	IIC Rating†
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz		
Walls^{2-6‡}								
<i>Monolithic:</i>								
1. 3/8-in plywood (1 lb/ft ²)	14	18	22	20	21	26	22	
2. 26-gauge sheet metal (1.5 lb/ft ²)	12	14	15	21	21	25	20	
3. 1/2-in gypsum board (2 lb/ft ²)	15	20	25	31	33	27	28	
4. 2 layers 1/2-in gypsum board, laminated with joint compound (4 lb/ft ²)	19	26	30	32	29	37	31	
5. 1/32-in sheet lead (2 lb/ft ²)	15	21	27	33	39	45	31	
6. Glass-fiber roof fabric (37.5 oz/yd ²)	6	9	11	16	20	25	16	
<i>Interior:</i>								
7. 2 by 4 wood studs 16 in oc with 1/2-in gypsum board both sides (5 lb/ft ²)	17	31	33	40	38	36	33	
8. Construction no. 7 with 2-in glass-fiber insulation in cavity	15	30	34	44	46	41	37	
9. 2 by 4 staggered wood studs 16 in oc each side with 1/2-in gypsum board both sides (8 lb/ft ²)	23	28	39	46	54	44	39	
10. Construction no. 9 with 2 1/4-in glass-fiber insulation in cavity	29	38	45	52	58	50	48	
11. 2 by 4 wood studs 16 in oc with 5/8-in gypsum board both sides, one side screwed to resilient channels. 3-in glass-fiber insulation in cavity (7 lb/ft ²)	32	42	52	58	53	54	52	
12. Double row of 2 by 4 wood studs 16 in oc with 3/8-in gypsum board on both sides of construction. 9-in glass-fiber insulation in cavity (4 lb/ft ²)	31	44	55	62	67	65	54	
13. 6-in dense concrete block, 3 cells, painted (34 lb/ft ²)	37	36	42	49	55	58	45	
14. 8-in lightweight concrete block, 3 cells, painted (38 lb/ft ²)	34	40	44	49	59	64	49	
15. Construction no. 14 with expanded mineral loose fill in cells	34	40	46	52	60	66	51	
16. 6-in lightweight concrete block with 1/2-in gypsum board supported by resilient metal channels on one side, other side painted (26 lb/ft ²)	35	42	50	64	67	65	53	
17. 2 1/2-in steel channel studs 24 in oc with 5/8-in gypsum board both sides (6 lb/ft ²)	22	27	43	47	37	46	39	
18. Construction no. 17 with 2-in glass-fiber insulation in cavity	26	41	52	54	45	51	45	
19. 3 5/8-in steel channel studs 16 in oc with 1/2-in gypsum board both sides (5 lb/ft ²)	26	36	43	51	48	43	43	
20. Construction no. 19 with 3-in mineral-fiber insulation in cavity	28	45	54	55	47	54	48	
21. 2 1/2-in steel channel studs 24 in oc with two layers 5/8-in gypsum board one side, one layer other side (8 lb/ft ²)	28	31	46	51	53	47	44	
22. Construction no. 21 with 2-in glass-fiber insulation in cavity	31	43	55	58	61	51	51	
23. 3 5/8-in steel channel studs 24 in oc with two layers 5/8-in gypsum board both sides (11 lb/ft ²)	34	41	51	54	46	52	48	
24. Construction no. 23 with 3-in mineral-fiber insulation in cavity	38	52	59	60	56	62	57	
<i>Exterior:</i>								
25. 4 1/2-in face brick (50 lb/ft ²)	32	34	40	47	55	61	45	
26. Two wythes of 4 1/2-in face brick, 2-in airspace with metal ties (100 lb/ft ²)	37	37	47	55	62	67	50	
27. Two wythes of plastered 4 1/2-in brick, 2-in airspace with glass-fiber insulation in cavity	43	50	52	61	73	78	59	
28. 2 by 4 wood studs 16 in oc with 1-in stucco on metal lath on outside and 1/2-in gypsum board on inside (8 lb/ft ²)	21	33	41	46	47	51	42	
29. 6-in solid concrete with 1/2-in plaster both sides (80 lb/ft ²)	39	42	50	58	64	67	53	
Floor-Ceilings^{2,3}								
30. 2 by 10 wood joists 16 in oc with 1/2-in plywood subfloor under 25/32-in oak on floor side, and 5/8-in gypsum board nailed to joists on ceiling side (10 lb/ft ²)	23	32	36	45	49	56	37	32

Building Construction	Transmission Loss (dB)						STC Rating	IIC Rating†
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz		
31. Construction no. 30 with 5/8-in gypsum board screwed to resilient channels spaced 24 in oc perpendicular to joists	30	35	44	50	54	60	47	39
32. Construction no. 31 with 3-in glass-fiber insulation in cavity	36	40	45	52	58	64	49	46
33. 4-in reinforced concrete slab (54 lb/ft ²)	48	42	45	56	57	66	44	25
34. 14-in precast concrete tees with 2-in concrete topping on 2-in slab (75 lb/ft ²)	39	45	50	52	60	68	54	24
35. 6-in reinforced concrete slab (75 lb/ft ²)	38	43	52	59	67	72	55	34
36. 6-in reinforced concrete slab with 3/4-in T&G wood flooring on 1 1/2 by 2 wooden battens floated on 1-in glass fiber (83 lb/ft ²)	38	44	52	55	60	65	55	57
37. 18-in steel joists 16 in oc with 1 5/8-in concrete on 5/8-in plywood under heavy carpet laid on pad, and 5/8-in gypsum board attached to joists on ceiling side (20 lb/ft ²)	27	37	45	54	60	65	47	62
Roofs²								
38. 3 by 8 wood beams 32 in oc with 2 by 6 T&G planks, asphalt felt built-up roofing, and gravel topping	29	33	37	44	55	63	43	
39. Construction no. 38 with 2 by 4s 16 in oc between beams, 1/2-in gypsum board supported by metal channels on ceiling side with 4-in glass-fiber insulation in cavity	35	42	49	62	67	79	53	
40. Corrugated steel, 24 gauge with 1 3/8-in sprayed cellulose insulation on ceiling side (1.8 lb/ft ²)	17	22	26	30	35	41	30	
41. 2 1/2-in sand and gravel concrete (148 lb/ft ³) on 28 gauge corrugated steel supported by 14-in-deep steel bar joists with 1/2-in gypsum plaster on metal lath attached to metal furring channels 13 1/2 in oc on ceiling side (41 lb/ft ²)	32	46	45	50	57	61	49	
Doors²								
42. Louvered door, 25 to 30% open	10	12	12	12	12	11	12	
43. 1 3/4-in hollow-core wood door, no gaskets, 1/4-in air gap at sill (1.5 lb/ft ²)	14	19	23	18	17	21	19	
44. Construction no. 43 with gaskets and drop seal	19	22	25	19	20	29	21	
45. 1 3/4-in solid-core wood door with gaskets and drop seal (4.5 lb/ft ²)	29	31	31	31	39	43	34	
46. 1 3/4-in hollow-core 16 gauge steel door, glass-fiber filled, with gaskets and drop seal (7 lb/ft ²)	23	28	36	41	39	44	38	
Glass^{1,2}								
47. 1/8-in monolithic float glass (1.4 lb/ft ²)	18	21	26	31	33	22	26	
48. 1/4-in monolithic float glass (2.9 lb/ft ²)	25	28	31	34	30	37	31	
49. 1/2-in insulated glass: 1/8- + 1/8-in double glass with 1/4-in airspace (3.3 lb/ft ²)	21	26	24	33	44	34	28	
50. 1/4- + 1/8-in double glass with 2-in airspace	18	31	35	42	44	44	39	
51. Construction no. 50 with 4-in airspace	21	32	42	48	48	44	43	
52. 1/4-in laminated glass, 30-mil plastic interlayer (3.6 lb/ft ²)	25	28	32	35	36	43	35	
53. Double glass: 1/4-in laminated + 3/16-in monolithic glass with 2-in airspace (5.9 lb/ft ²)	25	34	44	47	48	55	45	
54. Double glass: 1/4-in laminated + 3/16-in monolithic glass with 4-in airspace (5.9 lb/ft ²)	36	37	48	51	50	58	48	
55. Double glass: 1/4-in laminated + 1/4-in laminated with 1/2-in airspace (7.2 lb/ft ²)	21	30	40	44	46	57	42	

† IIC (impact isolation class) is a single-number rating of the impact sound transmission performance of a floor-ceiling construction tested over a standard frequency range. The higher the IIC, the more efficient the construction will be for reducing impact sound transmission. INR (impact noise rating) previously was used as the single-number rating of impact noise isolation. To convert the older INR data to IIC, add 51 to the INR number.

‡ A wide range of TL and STC performance can be achieved by gypsum wallboard constructions. Refer to ASTM E 90 laboratory report and literature from manufacturers for specific details such as type of gypsum board; gauge, width, and spacing of steel studs; glass-fiber or mineral-fiber insulation thickness and density; and complete installation recommendations.