

2006 IMC/Comm 64—HVAC

1. True or False: “Minimum Inside Temperatures” for various commercial building occupancies are defined in the IMC.

ANSWER: IMC 309/Comm Table 64.0309 True

2. When 7.5 CFM per person of outside air is provided in a place of assembly, how much air per person must be exhausted simultaneously, assuming the supply air is not applied towards secondary uses such as toilet rooms?

ANSWER: Comm 64.0403(1)(a) 7.5 CFM

3. True or False: Class rooms in public schools require mechanical ventilation under all conditions.

ANSWER: Comm Table 64.0403 True

4. True or False: Ventilation of dining areas may be accomplished by providing openable areas of outside doors and windows.

ANSWER: Comm Table 64.0403 False

5. A shop area used for auto repair in a vocational school is 40 feet wide by 60 feet long. The minimum amount of exhaust ventilation required is 12,000 CFM, 1,800 CFM or 1,200 CFM?

ANSWER: Comm Table 64.0403  $(40' \times 60') \times 0.50 = 2,400 \text{ sq.ft.} \times 0.50 \text{ cfm/sf.} = 1,200 \text{ CFM}$

6. True or False: Retail occupants may have natural ventilation provided by the area of outdoor openings equal to or greater than four (4) % of the floor area served.

ANSWER: IBC 1202.4.1 & Table 64.0403 True

7. True or False: Office buildings with openable windows require mechanical ventilation.

ANSWER: Comm Table 64.0403 True

8. Give the code section which would require the minimum inside temperature be maintained at 3 feet above the floor within the occupied space.

ANSWER: Comm 64.0309(1)

9. Can return air spaces (plenums) be located in a required fire resistance rated assembly which is made of wood?

ANSWER: IBC Table 601 & 602 states location of required fire resistance assemblies; IMC 602.3 condition 3 states that wood plenums cannot be used in required fire resistance assemblies. Thus No.

10. What is the minimum fire damper rating for a 1) a duct penetrating a fire barrier wall with less than a 3-hour fire resistance-rated assembly; 2) a duct penetrating a fire barrier wall with a 3-hour or greater fire-resistance-rated assembly?

ANSWER: IMC 607.3.1 OR IBC 716.3.1 1) 1-1/2 hr 2) 3 hr

11. What code section would you use to issue an order to submit heating and ventilation plans for a system which is being installed without prior approval?

ANSWER: Comm 61.30

12. What code section would you use to issue orders to provide ventilation for a toilet room having no window and one fixture?

ANSWER: Comm Table 64.0403

13. A 50 feet by 20 feet office has 3 interior walls with 1 exterior wall having an openable 4 feet by 2 feet window. How much tempered outside air is required?

ANSWER: Comm Table 64.0403- mechanical system required;  $20' \times 50' = 1,000$  sq.ft.; therefore  $(1,000 \text{ sq.ft.} / 1000 \text{ sf/7 people}) \times 7.5 \text{ cfm/person} = 52.5 \text{ cfm}$  of outside air.

14. A factory, office or mercantile building or storage garage which is less than 25,000 cubic feet does not require that building plans be submitted for approval. Does this exception apply to the heating plans?

ANSWER: Comm Table 61.30 Yes

15. Consider a store building which has heating approved with an infiltration loss included in the heat loss calculations since this building had the required 4% openable windows and doors for outside air. The occupancy is changed to a restaurant with dining area in which there are 15 people per 1,000 sf, or roughly 110 occupants.

a. True or False: This is a new use for which heating and ventilation requirements are more stringent than those covering the previous use.

ANSWER: Table 64.0002(3)(b)1. & Comm Table 64.0403 True, requires change from a naturally ventilated to a mechanically ventilated system.

b. True or False: For the 110 person dining room above, 1,100 CFM of outside air is provided along with an equal amount of exhaust. With this amount of outside air, the room complies with the code.

ANSWER: Table 64.0403 64.0403(1)(a), 64.0403(4)(b)1. True,  $110 \times 7.5 \text{ CFM} = 825 \text{ CFM}$  is the minimum amount required. The amount of outside air listed exceeds the minimum of the code, which is not a code conflict.

16. What information is necessary to determine an assembly's U-factor

- Total area involved
- Inside-Outside temperature differences
- Description of the construction

ANSWER: c.

17. True or False: Although the code does not directly address the need for tempered make-up air, the need is implied by way of application of the minimum indoor temperatures listed in Comm Table 64.0309 and design requirements stating that the temperature may not be less than that shown in the table measured 3 ft above the floor within the occupied space.

ANSWER: True, Reference Comm 64.0309

18. When an area requires tempered outside air, what procedure is used to determine the required amount?

- Multiply heat loss by 0.014
- Determine the number of air changes required and from this total volume divide by the constant 60 (60 = number of minutes in an hour)
- Use Comm Table 64.0403 to determine ventilation requirements, and IMC 403.1

ANSWER: c.

19. True or False: Consider a Type I commercial kitchen hood exhaust next to which is the toilet room which requires exhaust. To save expenses, the toilet room exhaust is connected to the kitchen exhaust since the kitchen exhaust exceeds the code requirement by 1,000 CFM. This satisfies code.

ANSWER: False, IMC 506.3 & 506.3.5 Exhaust systems from Type I hoods shall be independent of all other exhaust systems, unless a listed exception for connecting additional Type I hood(s) can be met.

20. True or False: Fire AND smoke dampers are required when a duct penetrates a required fire rated shaft enclosure, unless an exception can be met.

ANSWER: IBC 716.5.3/IMC 607.5.5 & Comm 62.0716/ 64.0607 True, actual operation for the smoke damper is found in IBC 716.3.2/IMC 607.3.2.1.

21. True or False: An eight-car showroom is connected to a repair garage which has 4% openable area, hot water convectors and no outside tempered air. There are no partitions between the showroom and the repair area. This satisfies code requirements.

ANSWER: False, exhausts are required for the repair area per Comm Table 64.0403; system must be balanced per Comm 64.0403(1)(a). Note the showroom (retail) could use 4% openables (See Table 64.0403) IF solid partitions were placed between the showroom and the repair area per Comm 64.0403(6)(b)1.

22. What is the minimum clearance above the floor for infrared gas-fired radiant heaters in a public garage assuming they are not protected from motor vehicle impact?
- 6 feet
  - 8 feet; or two feet higher above the floor than the height of the tallest vehicle
  - 10 feet

ANSWER: IMC 304.5 b is the answer

23. True or False: Smoke detection system control is required to be installed if the return air flow is greater than 2,000 cfm unless an exception can be met.

ANSWER: IMC 606.2 True

24. True or False: Clothes dryer exhaust ductwork has length limitations, requirements for metal ducts, and limitations involving the use of screws.

ANSWER: IMC 504.2, 504.4 and 504.6.1 True

25. True or False: Ducts and transfer openings can penetrate fire walls.

ANSWER: IMC 607.5.1/IBC 716.5.1 & 705.11 True except for penetrations of a fire wall located on a property line (ie a party wall) however there are limitations See IBC Table 704.8.

26. True or False: Exit enclosure (ie. fire rated stair enclosure) ventilation systems shall be independent of other building ventilation systems.

ANSWER: IBC 1020.1.3, 1021.5 True

27. True or False: Air can be supplied to a room and then transferred to a corridor, where it can then be returned to the air handler and redistributed.

ANSWER: IMC 601.2/IBC 1017.4 False