

Address:\_\_\_\_\_ Permit No.\_\_\_\_\_

**Town of Brookfield Building Department  
Calculations for Combustion Air**

This form must be filled out for all of the following Permits:

1. All new homes
2. All finished basements
3. All boiler, furnace, and water heater replacements

What is the total combined gross btu ratings of all appliances located in the boiler room or rooms?

\_\_\_\_\_

What is the volume of this room? (length x width x height) \_\_\_\_\_

Does the volume equal more than 50 cu. ft. for each 1,000 btu's of combined appliance ratings?

\_\_\_\_\_

If it does, combustion air is not required.

If it is less than 50 cubic feet for each 1,000 btu's of combining rating, combustion air is required.

How will compliance with combustion air be achieved? Check one below.

- a.) interior air\_\_\_\_\_
- for interior air, what is the volume of the room the air is being taken from\_\_\_\_\_
- b.) air directly from the exterior of the building thru screened openings\_\_\_\_\_
- c.) air directly from the outside thru horizontal ducts\_\_\_\_\_

What is the calculated size of each opening?\_\_\_\_\_

Where will each opening be located?\_\_\_\_\_

Copies of your calculations must be submitted to the Building Official

I attest that I have done the above required calculations based on Chapter 17 of the 2015 IRC Mechanical Code or Chapter 7 of the 2015 IMC In Accordance with NFPA 31

Signed\_\_\_\_\_

Printed Name\_\_\_\_\_

Company\_\_\_\_\_

What is the total gross btu ratings for all fuel burning appliances?

Example:	2 furnaces at 100,000 btu's =	200,000 btu's
	1 water heater at 85,000 btu's =	85,000 btu's
Total		285,000 btu's

How many cubic feet are contained in the room that the appliances are located?

Example:

The room is 40 feet long by 28 feet wide by 7 foot 6 inches high.  
This equals 8,400 cubic feet.

The code requires a room to be 50 cubic feet for each 1,000 btu's of appliances.  
So, in the above illustration, we have 285,000 btu's, so we would need  $50 \times 285$  or 14,250 cubic feet.  
So, for the above example, the room the boiler is in would be defined as a confined space, so we would need to introduce Combustion air.

Where we get the air for combustion will determine what size openings are required.

If we are getting the air from an interior space we will need 1 square inch for each 1,000 btu's of combined rating. For the above example, we will need each opening to be 285 square inches. One opening within 12 inches of the ceiling and one opening within 12 inches of the floor.

If we are getting air directly from the outside through louvers, we will need 1 square inch for each 4000 btu's. This will require 72 square inches but the code has set 100 square inches as the minimum size opening for combustion air. So, we will require 2 openings 100 square inches each located as above.

If we are getting air from the outside through horizontal ducts, we will require 1 square inch for each 2000 btu's. So, for the above example, we will require 2 openings, each opening to be 285 divided by 2 = 143 square inches located as above.

Remember, if an interior source is being used, the space we are getting the air from must meet the 50 cubic feet for each 1000 btu's rule also. The size of the boiler room can be combined with the size of the room that the air is being taken from to achieve this volume. All calculations must be approved by the Building Official.

## Section 710

### Opening obstructions

Metal louvers free air is 75%.

Wooden louvers free air is 25%.