

How to calculate duct length for a range hood

Firstly we need to understand a critical element in range hood ducting – static pressure in the kitchen hood duct configuration

Static Pressure: Inside every duct, there is a constant pressure being exerted at any point from all directions. When an range hood fan moves air through the duct, the air counters resistance from this pressure which is known as static pressure. Thus, kitchen venthood fan has to have the ability to overcome the static pressure in a duct so as to effectively duct stale air to the outside of your home. This can be done by calculating the equivalent duct length of any duct for the range hood ducting.

Calculating Equivalent Duct Length (EDL): Simply measuring the length of a duct is not enough to know how much static pressure an exhaust fan has to overcome. Ducts may have one or more elbows, turns, or wall caps which add to the static pressure in a duct. Thus, you have to calculate the equivalent duct run and not the actual duct run so as to size an exhaust fan properly.

The static pressure in any duct run differs according to the material of the duct, number of elbows and turns, exterior wall cap and wall jacks etc. Listed below are the standard values for different duct components.

- Smooth metal duct: Actual duct length x 1 (eg. 3ft of duct = 3EDL)



- Flex aluminum duct: Actual duct length x 1.25 (for 4" diameter duct)
Actual duct length x 1.50 (for 6" diameter duct)



- Insulated flex duct: Actual duct length x 1.50 (for 4" diameter duct)
Actual duct length x 2.00 (for 6" diameter duct)



- Wall caps/roof caps/back draft dampers: 30 feet for each cap (for 4" diameter duct)
40 feet for each cap (for 6" diameter duct)



- Elbows and turns: 15 feet for each (for 4" diameter duct)
20 feet for each (for 6" diameter duct)

For example assuming 6" ducting for the kitchen range hood:

10ft of straight rigid duct		10
2ft of flexible alum duct	1.5 x 2'	3
2 elbows	2 x 20'	40
Wall cap	1 x 30'	30
Back draft damper	1 x 30'	30
Total EDL		113EDL

A rule of thumb is that a duct run for a range hood should not exceed 100EDL

Using the above values, you can calculate the equivalent straight duct length that an exhaust fan has to overcome so as to push stale air outside your home and counter static pressure effectively.