



If it is desired to figure on a basis of the number of air changes the expression would be $N = \frac{W_p \times I_h}{C}$

in which N = Number of air changes

W_p = Window crack perimeter

I_h = Infiltration per hour per lineal foot of cracks

C = Cubical contents

The crack perimeter of a double hung window is four times the height, and three times the width of the lower sash.

The perimeter of doors is the width plus the height times two, single casements the same, double casements twice the width and three times the height.

COMPARISON OF FUEL QUANTITIES AND COSTS TO HEAT AIR ENTERING VARIOUS SLIDING SASH WINDOWS, AS AIR INFILTRATION OR INLEAKAGE. ASSUMING 65 PER CENT OVER ALL EFFICIENCY OF HEATING PLANT

Window, 3 x 7 ft. Crack, 23 lin. ft.
Wind, 20 miles per hr.
B.t.u. to raise 1 cu. ft. air from zero to 70 deg., 1,439
B.t.u. per lb. best coal, 13,080
Duration heating season, 130 days
Cost coal, \$6.00 per ton
Overall efficiency of heating plant, 65 per cent (high)
Net B.t.u. = $13,080 \times 0.65 = 8500$ B.t.u. effective leakage.

- A. Unstripped window, 114 cu. ft. per hr. per ft. crack
B. Plain Rib Strip (3 miles), 55.8 cu. ft. per hr. per ft. crack
C. Metal Weather Strip, 24 cu. ft. per hr. per ft. crack

$$A. \frac{23 \times 114 \times 1.439}{8500} = 0.445 \text{ lb. coal per hr.}$$

$$\frac{0.445 \times 24 \times 130}{2000} = \frac{1385}{2000} = 0.694 \text{ tons per season}$$

$$\$6.00 \times .694 = \$4.16 \text{ per season}$$

$$B. \frac{23 \times 55.8 \times 1.439}{8500} = 0.218 \text{ lb. coal per hr.}$$

$$\frac{0.218 \times 24 \times 130}{2000} = \frac{680}{2000} = 0.34 \text{ tons per season}$$

$$\$6.00 \times .34 = \$2.04 \text{ per season}$$

$$C. \frac{23 \times 24 \times 1.439}{8500} = 0.0935 \text{ lb. coal per hr.}$$

$$\frac{0.0935 \times 24 \times 130}{2000} = \frac{292}{2000} = 0.146 \text{ tons per season}$$

$$\$6.00 \times 0.146 = \$0.875 \text{ per season}$$



SUMMARY

A	\$4.16	A	\$4.16	B	\$2.04
B	2.04	C	.875	C	.875
A-B	\$2.12	A-C	\$3.285	B-C	\$1.165

Fuel cost per window—

Without weather strips.....	\$4.16
With Rib strip.....	2.04
With metal adjustable.....	.875

Fuel saved with—

Rib strip.....	\$2.12
Metal adjustable.....	3.285
Metal vs. Rib.....	1.165

The above is based on infiltration on windward side of building.

Room, 15 x 15 x 10 = 2250 cu. ft.
Wall, 300 net = 264 sq. ft.
Crack Aperture, 42 ft.
Glass, 36 = 36 sq. ft.
Ceiling, = 225 sq. ft.
Two windows, 3 x 6, crack aperture, 2 x 21 ft. x 1/8 in.
Wind velocity, 20 miles per hr.

INFILTRATION PER HOUR PER FOOT OF CRACK	No. STRIP	RIB STRIP	METAL STRIP
	114 Cu. Ft.	55.8 Cu. Ft.	24 Cu. Ft.
Wall.....	5540 B.t.u.	5540 B.t.u.	5540 B.t.u.
Glass.....	2520 "	2520 "	2520 "
Crack Infiltration.....	6900 "	3375 "	1450 "
Ceiling.....	4725 "	4725 "	4725 "
	19,685 B.t.u.	16,160 B.t.u.	14,235 B.t.u.

With equal consumption and radiation, inside temperature would be as follows:

$$\frac{19,685 \text{ B.t.u.}}{240 \text{ rad. eff.}} = 59 \text{ sq. ft. rad. } 38 \text{ in., } 2 \text{ col., } \begin{cases} 60 \text{ deg. inside} \\ 0 \text{ deg. outside} \end{cases}$$

$$\frac{16,160 \text{ B.t.u.}}{240 \text{ rad. eff.}} = 59 \text{ sq. ft. rad. } 38 \text{ in., } 2 \text{ col., } \begin{cases} 65 \text{ deg. inside} \\ 0 \text{ deg. outside} \end{cases}$$

$$\frac{14,235 \text{ B.t.u.}}{240 \text{ rad. eff.}} = 59 \text{ sq. ft. rad. } 38 \text{ in., } 2 \text{ col., } \begin{cases} 70 \text{ deg. inside} \\ 0 \text{ deg. outside} \end{cases}$$