Duct Sheet Metal Area, Weight and Insulation Quantity

Sheet metal area and weight of rectangular or round ductwork from size, length and thickness, with the external insulation area and volume, for estimating.

Method: Perimeter × length with allowance (estimating practice)

Input parameters

Unit system: SI

Parameter	Value	Unit
Duct shape	Rectangular	
Diameter (round)	400.00	mm
Width (rectangular)	800.00	mm
Height (rectangular)	500.00	mm
Length	50.000	m
Sheet thickness	0.80000	mm
Sheet density	7,850.0	kg/m³
Allowance for seams, joints and stiffeners	15.000	%
Insulation thickness (0 if none)	25.000	mm

Calculated results

Parameter	Value	Unit
Sheet area (with allowance)	149.50	m²
Sheet weight	938.86	kg
Insulation outer area	140.00	m²
Insulation volume	3.3750	m³

Formula and method

$$A_s = PL(1+k_s), \quad m = A_s t \rho$$

$$A_i = P_i L, \quad V_i = (A_{out} - A_{in})L, \quad P_i = \pi(D+2t_i) \text{ or } 2(W+H+4t_i), \quad A_{out} = \frac{\pi(D+2t_i)^2}{4} \text{ or } (W+2t_i)(H+2t_i)$$

Variables

shape	Duct shape	-
D	Diameter (round)	m
W	Width (rectangular)	m
H	Height (rectangular)	m
L	Length	m
t	Sheet thickness	m
ρ	Sheet density	kg/m³
k_s	Allowance for seams, joints and stiffeners	-
t_i	Insulation thickness (0 if none)	m
A_s	Sheet area (with allowance)	m²
m	Sheet weight	kg
A_i	Insulation outer area	m²
V_i	Insulation volume	m³

Method and standards

Geometry.

Assumptions and limits

- Straight duct.
- Rectangular insulation is taken with square outer corners, slightly overstating its area and volume.

References

- Perimeter × length with allowance (estimating practice)

Report details

Report reference	FCC-MKKZ-07V7 (the same inputs always give the same reference)
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Release checks	2 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/hvac/ducts/duct-sheet-metal-area

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.