Welding Heat Input and Arc Energy (kJ/mm)

Arc energy and heat input of a weld run from voltage, current and travel speed, with the process thermal efficiency factor, in kJ/mm.

Method: EN ISO 1011-1 / ISO/TR 17671-1 (arc energy and heat input)

Input parameters

Unit system: SI

Parameter	Value	Unit
Arc voltage	28.000	V
Welding current	250.00	A
Travel speed	300.00	mm/min
Thermal efficiency factor of the process 1 gives the arc energy. For heat input use the factor your welding code gives for the process (EN ISO 1011-1 / ISO/TR 17671-1).	100.00	%

Calculated results

Parameter	Value	Unit
Heat input (kJ/mm)	1.4000	
Arc energy (kJ/mm)	1.4000	
Heat input (kJ/in)	35.560	

Formula and method

$$E = \frac{U I}{v} \qquad Q = k E$$

Variables

U	arc voltage	V
I	welding current	A
v	travel speed	m/s
k	thermal efficiency factor	–
Q	heat input	kJ/mm
E	arc energy	kJ/mm
Q_{in}	heat input	kJ/in

Method and standards

Arc energy and heat input as defined in EN ISO 1011-1 and ISO/TR 17671-1.

Assumptions and limits

- Steady arc; for pulsed processes use instantaneous energy.
- With the default k = 1 the heat input equals the arc energy; enter the process factor (for example about 0.8 for GMAW) to report heat input.

References

- EN ISO 1011-1 / ISO/TR 17671-1 (arc energy and heat input)

Report details

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Release checks	3 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/materials/welding/welding-heat-input

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.