Injection Moulding Clamping Force

Clamping force for an injection moulding tool from the projected area of the parts and runner, cavity pressure, number of cavities and a safety margin.

Method: F = projected area × cavity pressure × (1 + margin)

Input parameters

Unit system: SI

Parameter	Value	Unit
Projected area of one part	120.00	cm²
Number of cavities	4.0000	
Projected area of the runner	20.000	cm²
Mean cavity pressure (gauge) From the material maker or flow analysis; depends on flow length and wall thickness.	35.000	MPa
Safety margin	15.000	%

Calculated results

Parameter	Value	Unit
Total projected area	500.00	cm²
Clamping force	2,012.5	kN
Clamping force in press units	205.22	tf

Formula and method

$$F = (nA_p + A_r)\, p_c\, (1 + k)$$

Variables

A_p	Projected area of one part	m²
n	Number of cavities	-
A_r	Projected area of the runner	m²
p_c	Mean cavity pressure (gauge)	Pa
k	Safety margin	-
A	Total projected area	m²
F	Clamping force	N
P	Clamping force in press units	N

Method and standards

Force balance.

Assumptions and limits

- Uniform mean cavity pressure (gauge; the atmosphere acts on both sides of the mould).
- The press rating is shown in tonne-force (kip in FPS).

References

- F = projected area × cavity pressure × (1 + margin)

Report details

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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/mechanical/manufacturing/injection-clamping-force

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.