

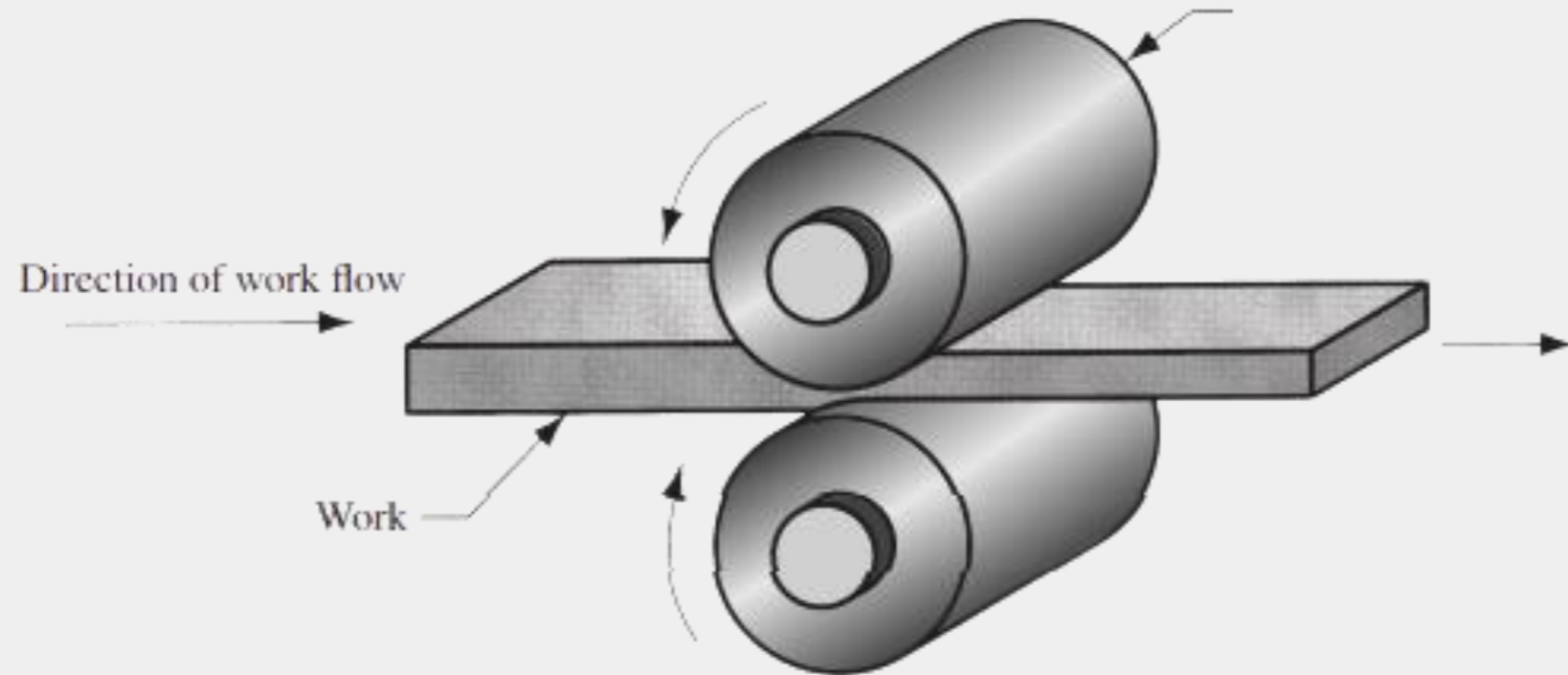
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19AST202-Aircraft Production Technology

UNIT II METAL FORMING & MACHINING PROCESSES

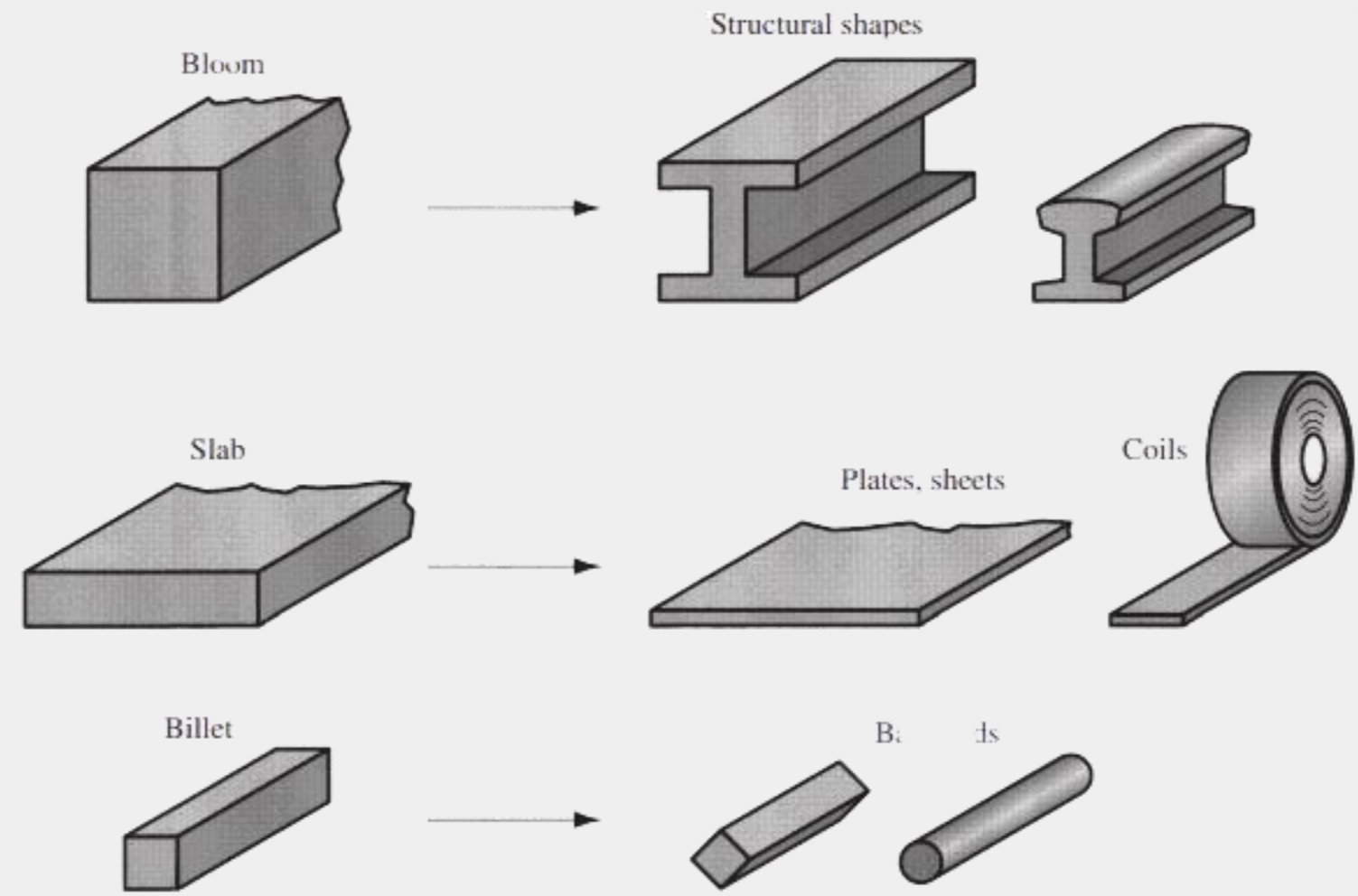
Bulk Deformation Processes in Metal Working

Prof.Dr.MSUBRAMANIAN



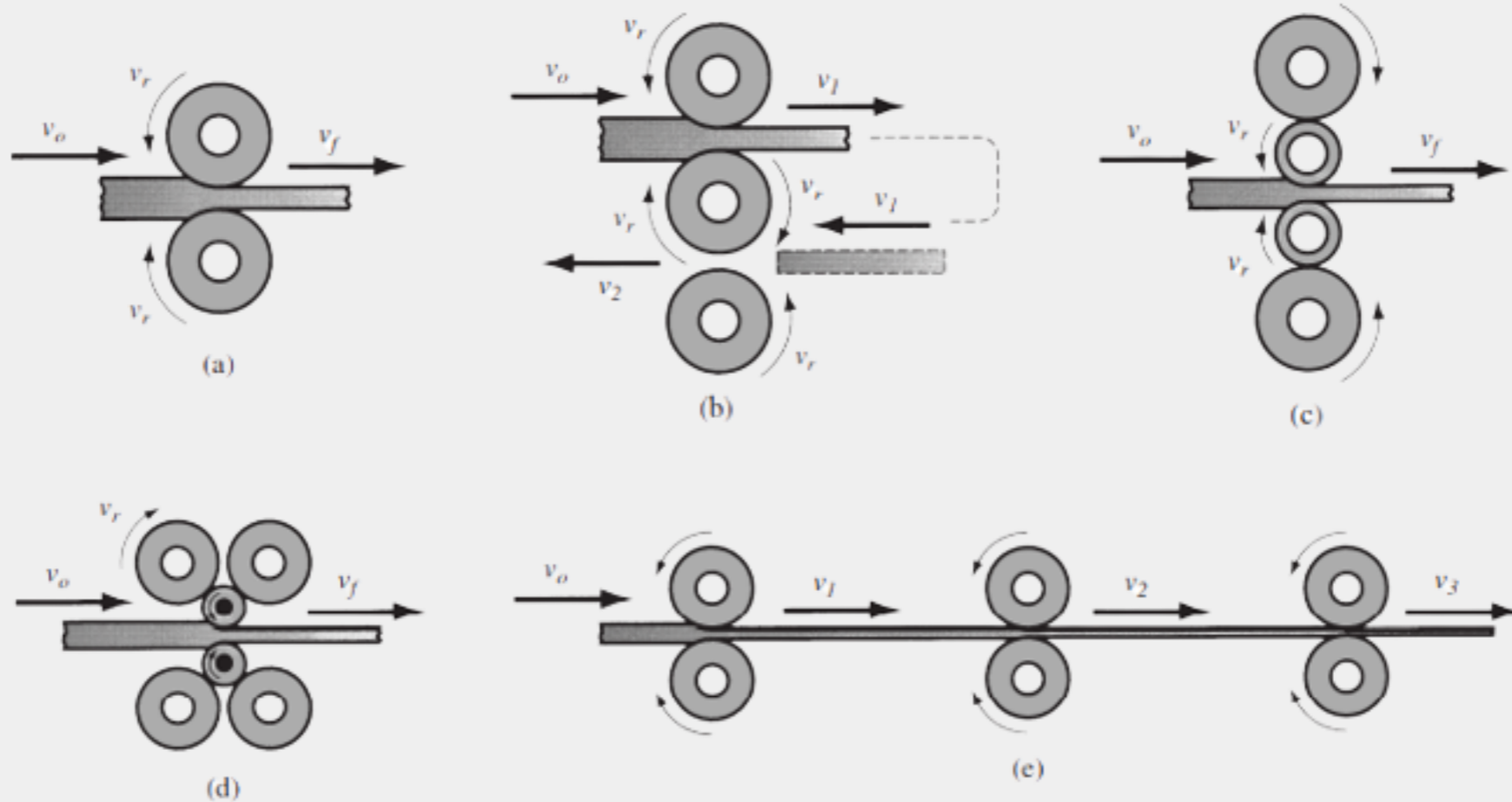
The rolling process (specifically, flat rolling)

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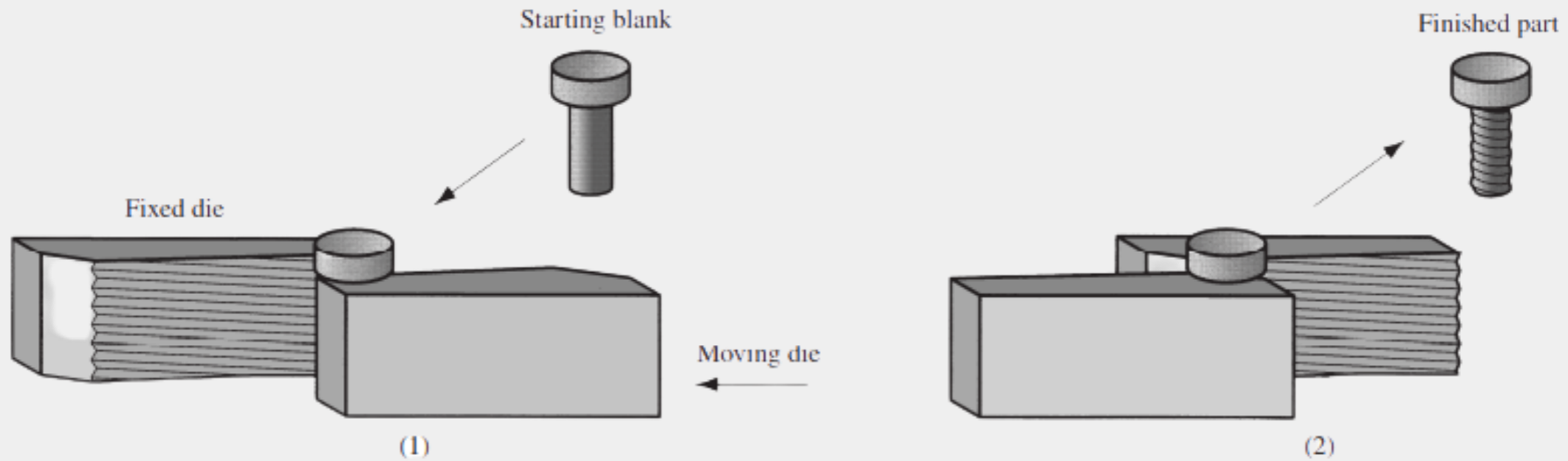


Some of the steel products made in a rolling mill.

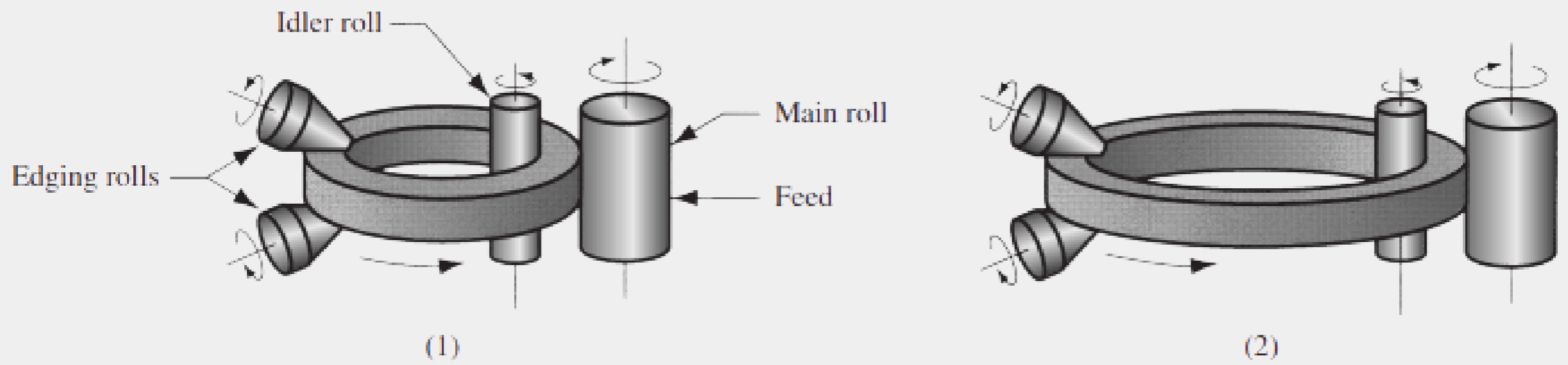
ROLLING MILLS



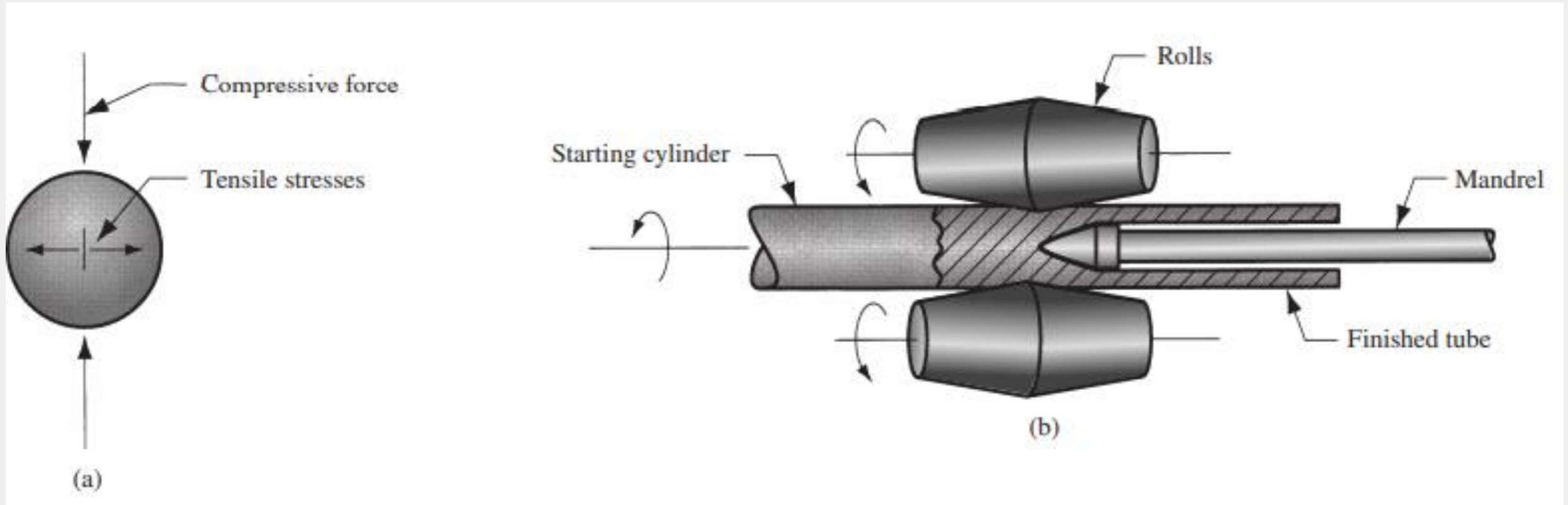
Various configurations of rolling mills: (a) two-high, (b) three-high, (c) four-high, (d) cluster mill, and (e) tandem rolling mill.



THREAD ROLLING

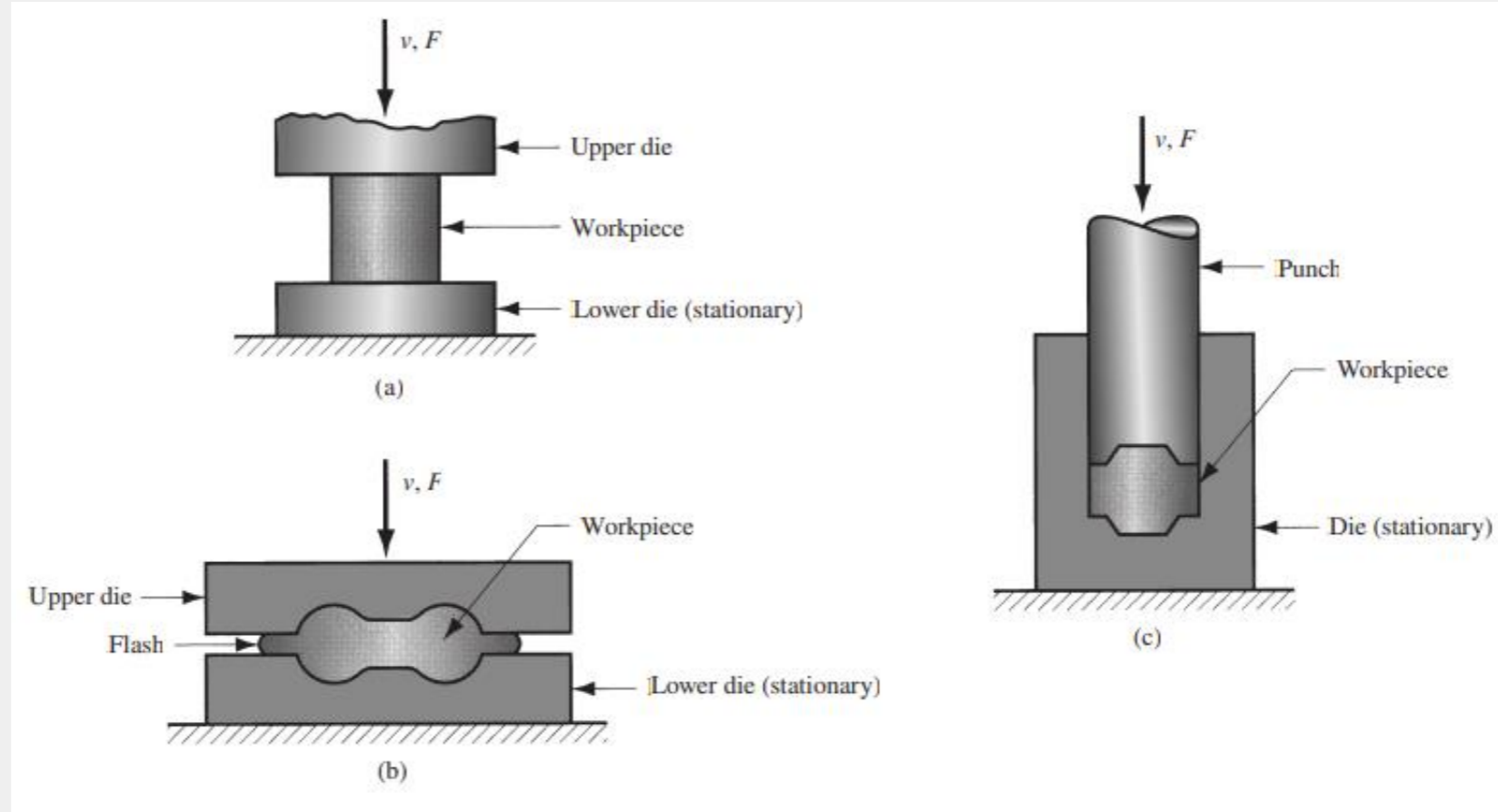


Ring rolling used to reduce the wall thickness and increase the diameter of a ring: (1) start and (2) completion of process.

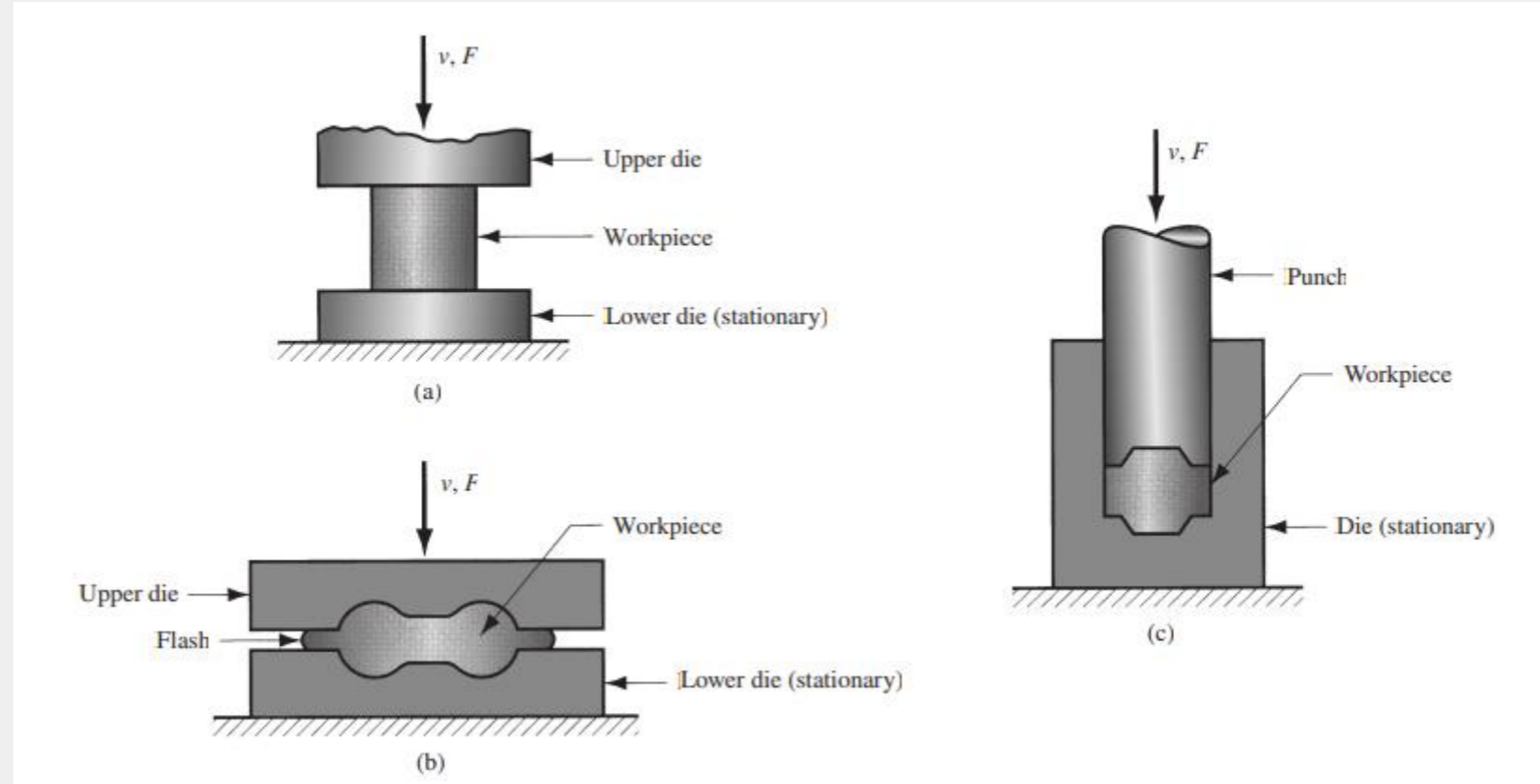


Roll piercing: (a) formation of internal stresses and cavity by compression of cylindrical part; and (b) setup of Mannesmann roll mill for producing seamless tubing.

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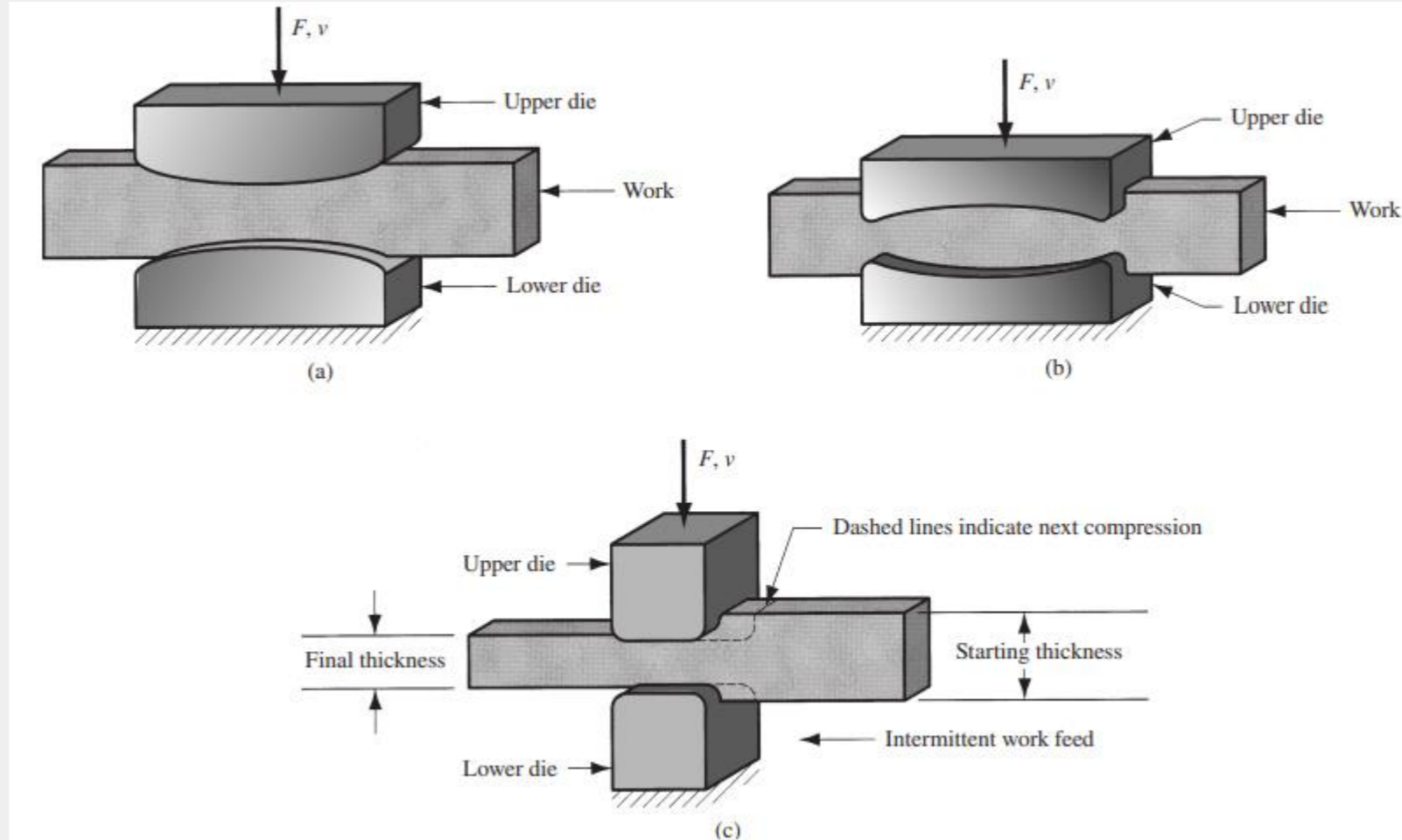


Three types of forging operation illustrated by cross-sectional sketches: (a) open-die forging, (b) impression die forging, and (c) flashless forging.

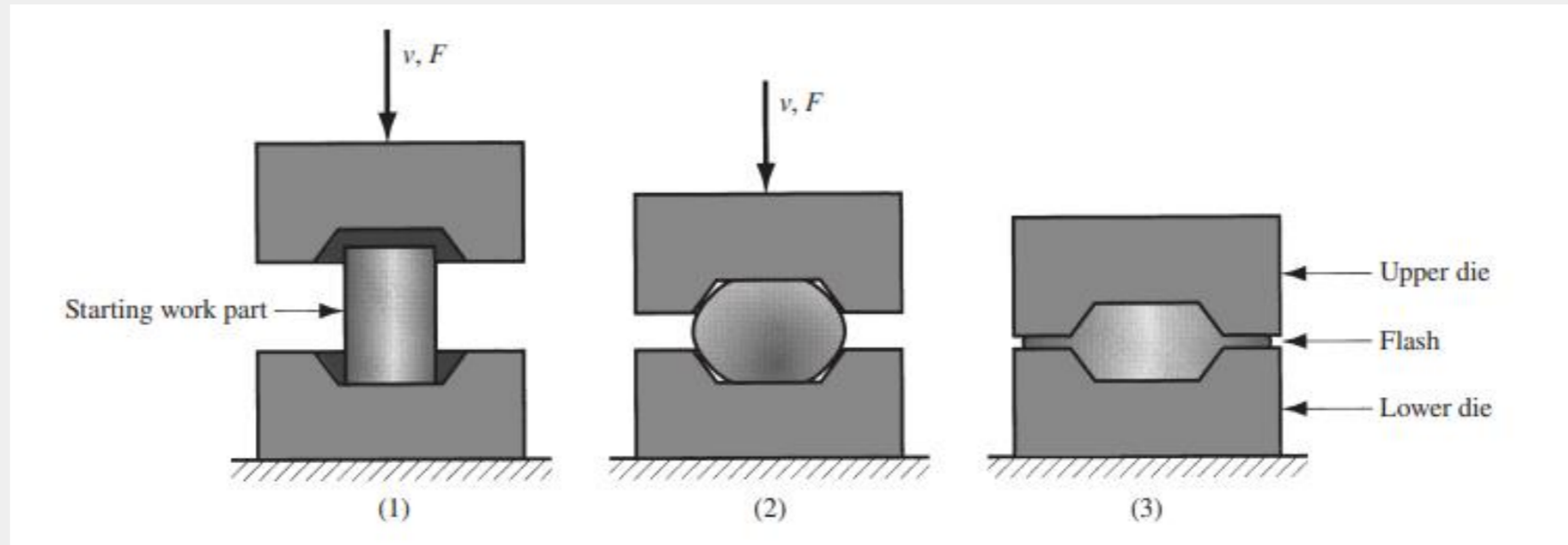


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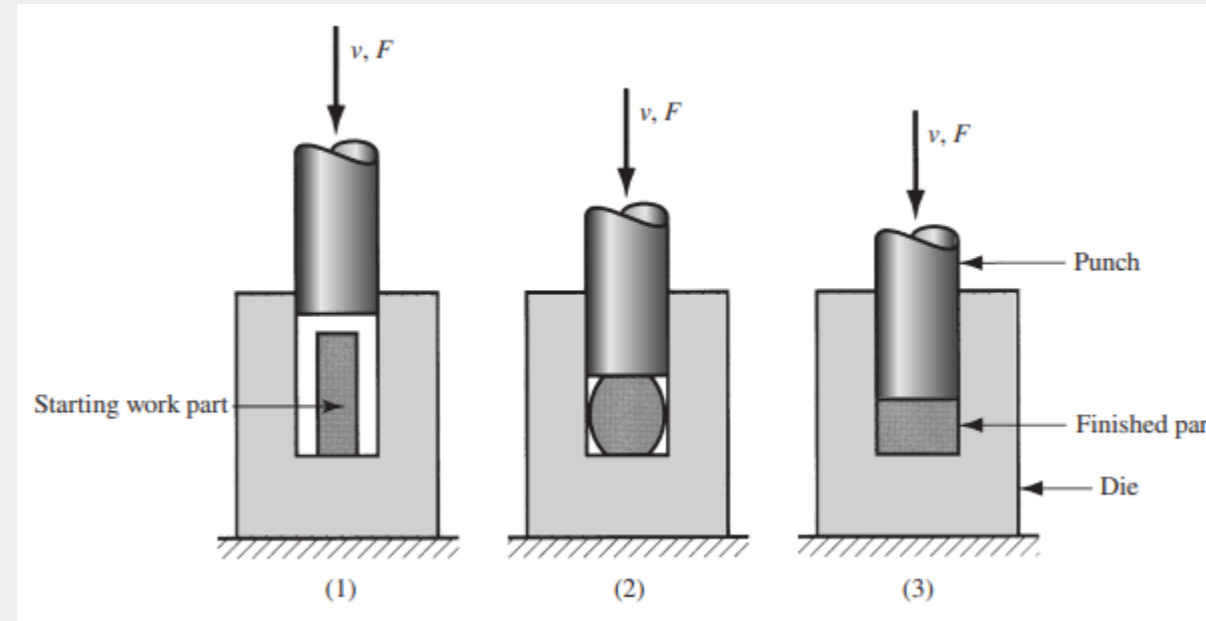


Several open-die forging operations: (a) fullering, (b) edging, and (c) cogging.

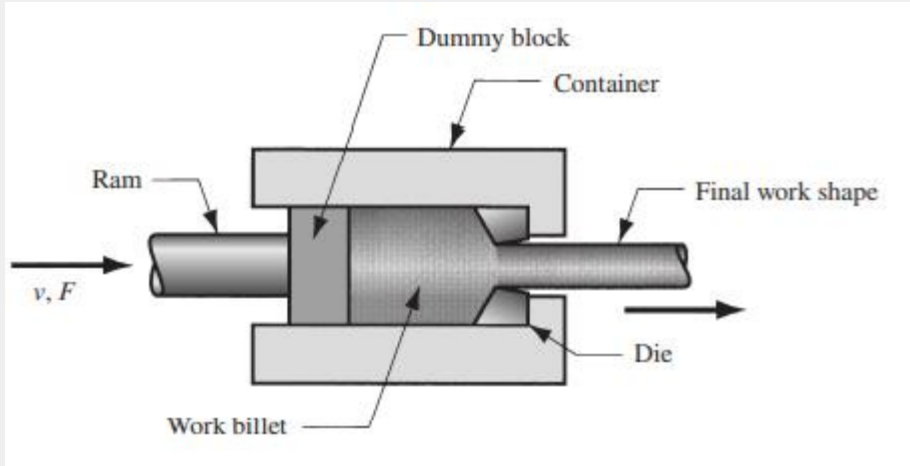


4 Sequence in impression-die forging: (1) just prior to initial contact with raw workpiece, (2) partial compression, and (3) final die closure, causing flash to form in gap between die plates

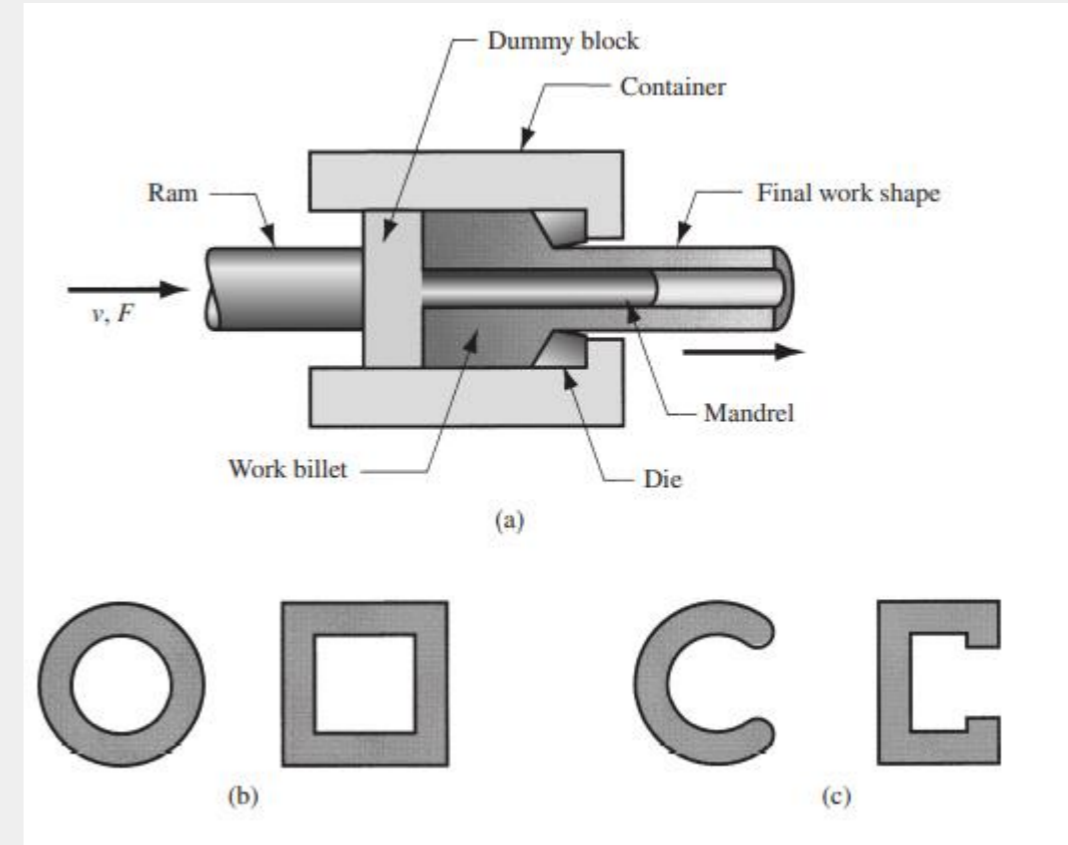
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Flashless forging: (1) just before initial contact with workpiece, (2) partial compression, and (3) final punch and die closure.

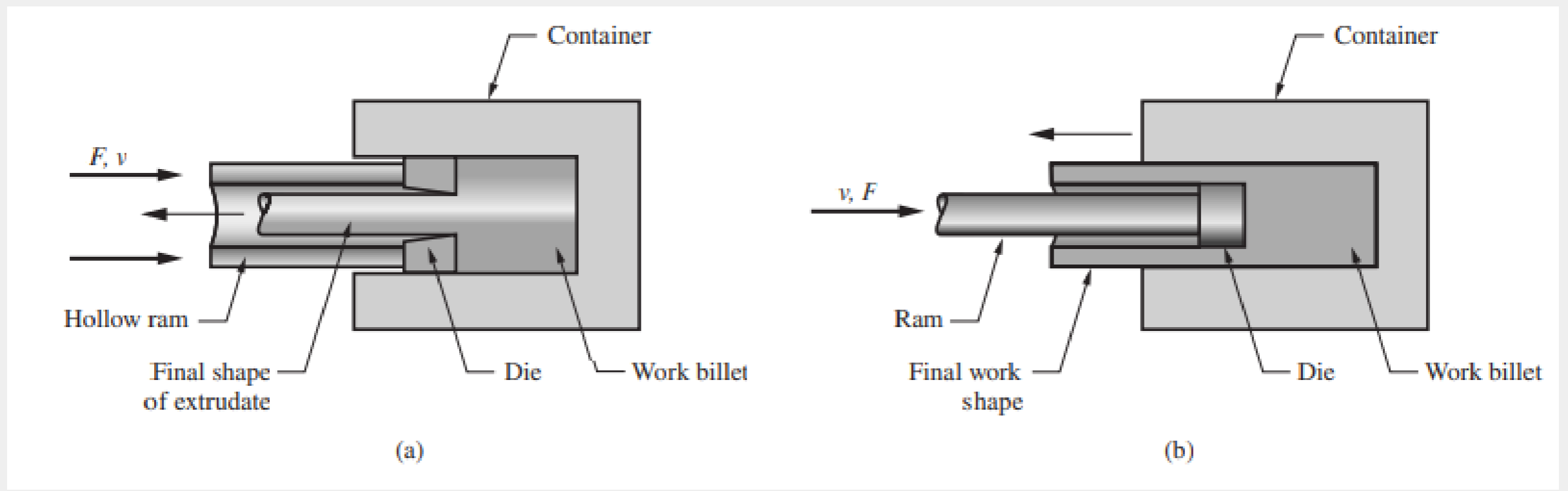


Direct extrusion



(a) Direct extrusion to produce a hollow or semi-hollow cross section; (b) hollow and (c) semi-hollow cross sections

TYPES OF EXTRUSION



Indirect extrusion to produce (a) a solid cross section and (b) a hollow cross section

Thank You!