

FORGEMASTER
STOOSS
STEEL AT ITS BEST



Forging Process Guide

Material Inspection Cutting Department

Material Inspection

Inventory of round billets
and ingots



Billets in condition:

- hot rolled
- casted
- continuous casted
- forged



Cutting Department



Cutting of round billets



Weight control

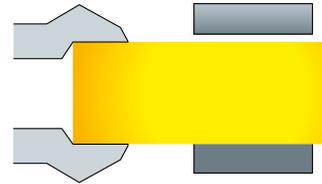
Visual control



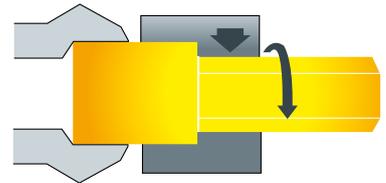
Hammer- and Open-Die Forging

Hammer Forging

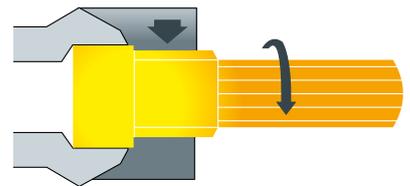
Starting stock,
held by manipulator



Open-die forging

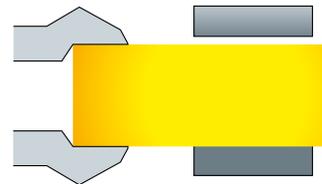


Progressive forging

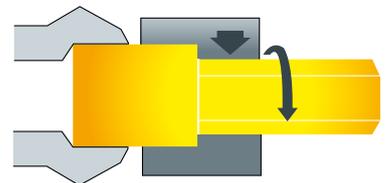


Open-Die Forging

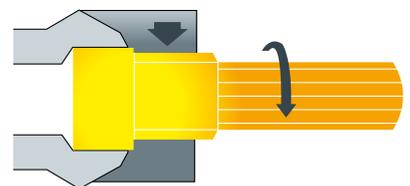
Starting stock,
held by manipulator



Open-die forging

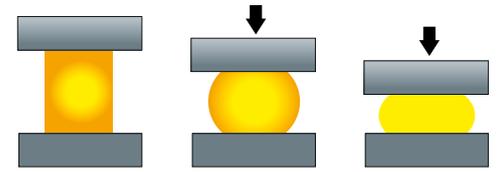


Progressive forging
Visual and dimensional
control

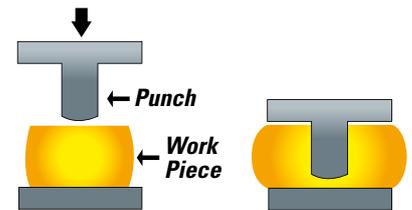


Ring Rolling

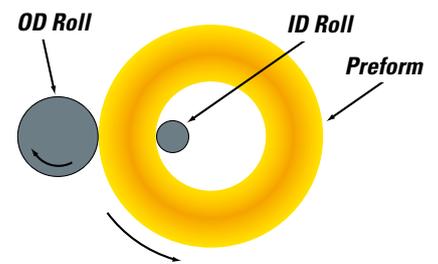
The ring rolling process typically begins with up-setting of the starting stock on flat dies at its plastic deformation temperature – in the case of grade 4340 steel, approximately 1250° C.



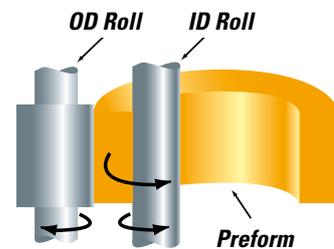
Piercing involves forcing a punch into the hot upset stock causing metal to be displaced radially, as shown by the illustration to the right.



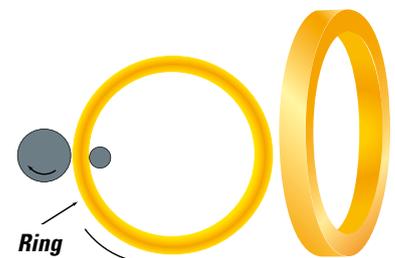
The doughnut-shaped preform is slipped over the ID roll shown here from an "above" view.



A side view of the ring mill and preform workpiece. Workpiece, thus squeezing it against the OD roll which imparts a rotary action...



...resulting in a thinning of the section and a corresponding increase in the diameter of the ring.



Once off the ring mill, the ring is then ready for secondary operations such as close tolerance sizing, parting, heat treatment and test/inspection.



Visual and dimensional control

Heat Treatment

For example

- normalising
- quenching and tempering
- annealing
- soft-annealing



Water quenching



Oil quenching



Polymer quenching



Data recording
Heat treatment cycle

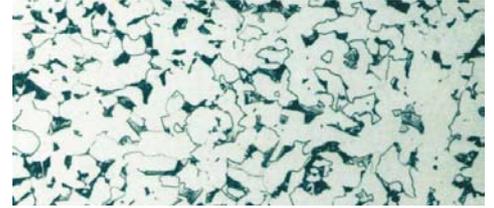
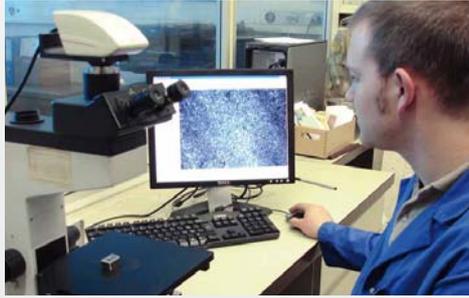


Hardness testing

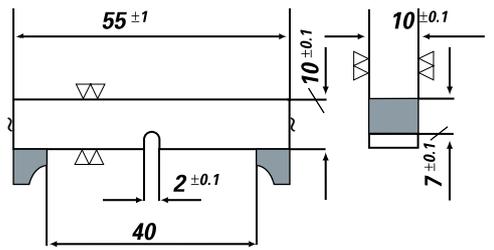


Testing

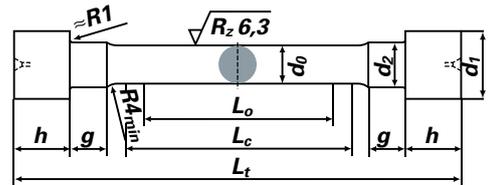
Microetch
Grain structure



Charpy impact test



Tensile test



UT-testing



Surface crack testing



Dimensional control

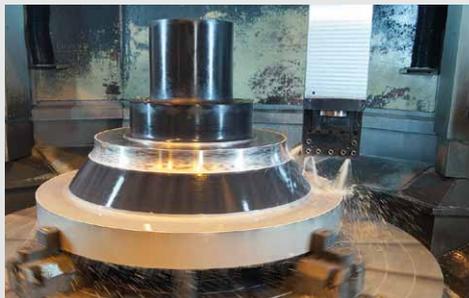


Machining

*Flame cutting
Shot blasting*



Pre-machining



*Milling
Boring*



Finish-machining



*Final documentation
Shipping*



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