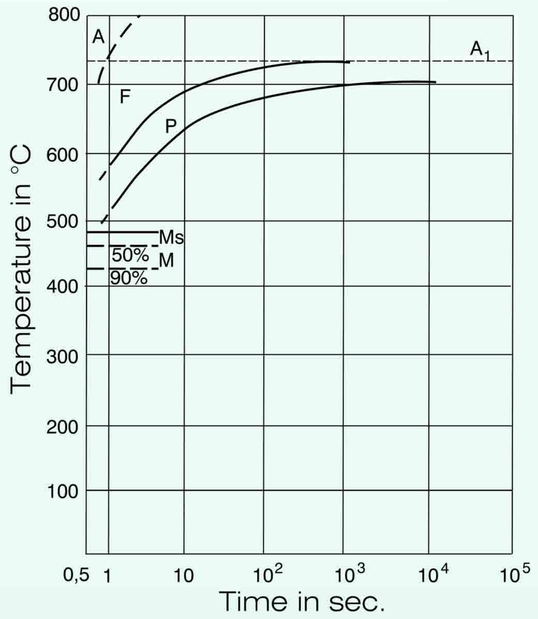
EM20

PRESSURE COATING UPON DRAWING OF WIRE ROD WITH SCALE LAYER AN INNOVATIVE PROCESS OF THE MECHANICAL SURFACE CLEANING

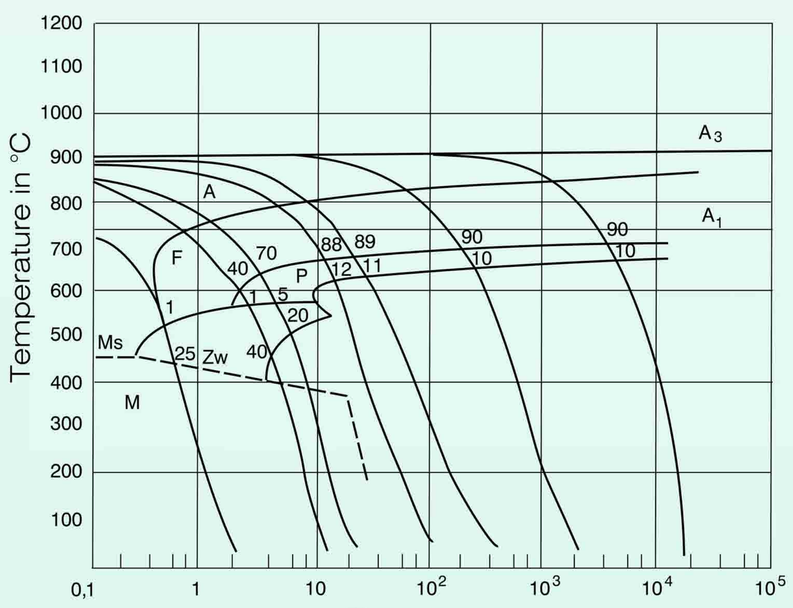
Principles

- Scale and/or rust layer wrapped with lubricants
- Ideal regular elongation and with that the simultaneous breaking loose the layer, which has to be removed from the wire surface upon the forming process under the conditions of the pressure coating
- Easy removability of the broken loose scale-/lubricant-layer
- Absolutely surface saving descaling process without local stresses of the crystalline grain texture in the surface area
- Avoiding material transformation up to martensite--generation

Transformation course of typical steels

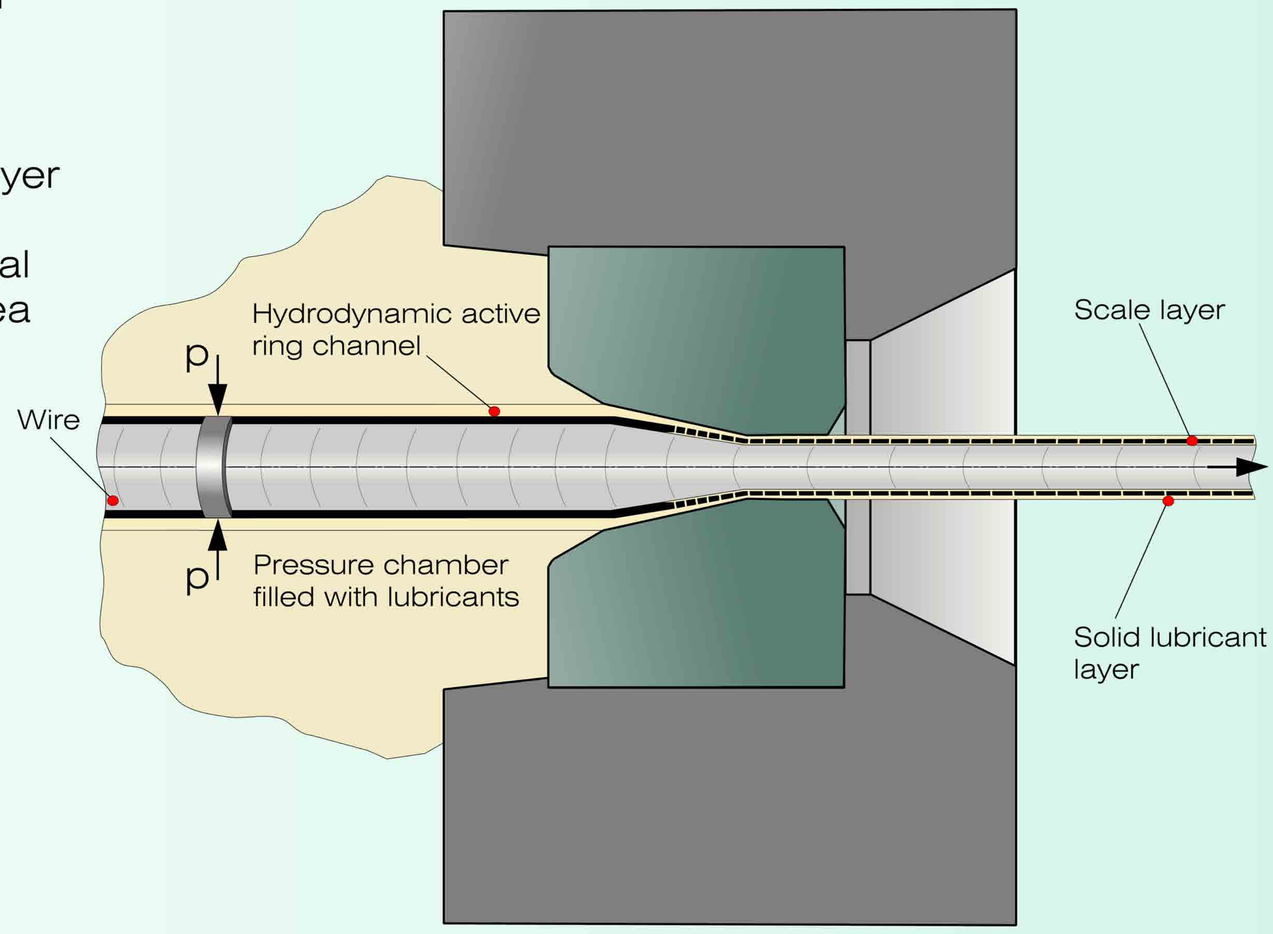


Time-temperature-transformation-graph of a non-alloyed steel with 0.06% carbon content (according to Popov and Popova)*



Time-temperature-transformation-graph of a non-alloyed construction steel with 0.13% carbon content (according to Wever, Rose and Peter)*

Representation of the principle Descaling by means of the pressure coating



Effects on the drawing process Advantages

- Achievement of a regular clean wire surface
- Smallest space requirement
- Smallest device-expenditure and -wear
- Avoiding of local and partial extreme stresses of the wire surface as a result of deformation, temperature effects and grain texture transformation in comparison to conventional descaling processes
- Avoiding of micro-cracks in the surface area as a result of the exceeding of the boundary deformation
- Detaching of troubles of the drawing process by groove-generation as a result of the breaking loose of stressed grain texture parts from the surface-near matrix of the wire
- Preventation of bubble- and stain-generation etc. upon subsequent surface refining processes e.g. electrolytic Nickel- and Chrome-plating

Surface after mechanical descaling without guidance marks

Surface after mechanical descaling with guidance marks

Strongly deformed surface after brushing

*H.J.Eckstein, "Temperature treatment of steel"

Strehlener Straße 14, 01069 Dresden, Telefon/Fax 0351/46 57 300, www.ecoform.de, ecoform@ecoform.de

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