NEWS VIEWS

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Determination to Establish Excellence
Through Efficiency and Expertise

ISO-9001

Sub-Zero Treatment

(Reduction in Retained Austenite)

Benefits of Sub-Zero Treatment

1. Higher hardness.
2. Life of Roll increases.
3. Soft Austenite content is reduced in micro structure.
4. Wear resistance improves.
5. Dimensional stability is achieved.

SUB-ZERO TREATMENT -

The structure of Steel when heated to austenitic temperature (hardening temp.) and cooled rapidly (quenched) gets converted to martensite. The formation of martensite gives wear resistance and increases the hardness of steel. However, during quenching process complete transformation of structure from austenite to martensite does not take place because of high stability of austenite. This is especially true for steels having higher alloying elements. Hence, some austenite always remains in the structure of steel after quenching. Presence of austenite reduces dimensional stability, wear resistance/life of tool. Normally, austenite tends to get transformed to martensite when tempered at 250°C and above, depending upon composition of steel, but the process does not result in complete transformation. To reduce quantity of retained austenite sub-zero treatment is given to tools. lt increases life of tool.

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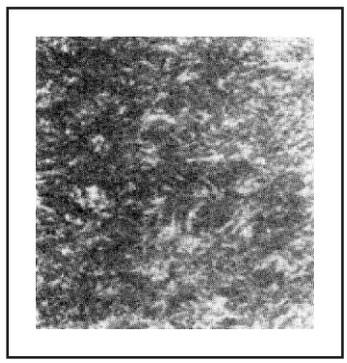
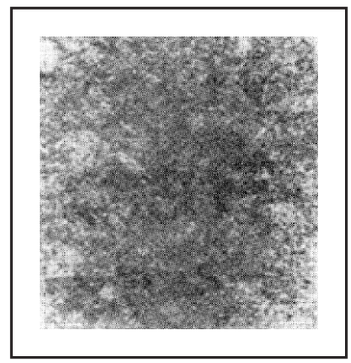


Tempered Martensite



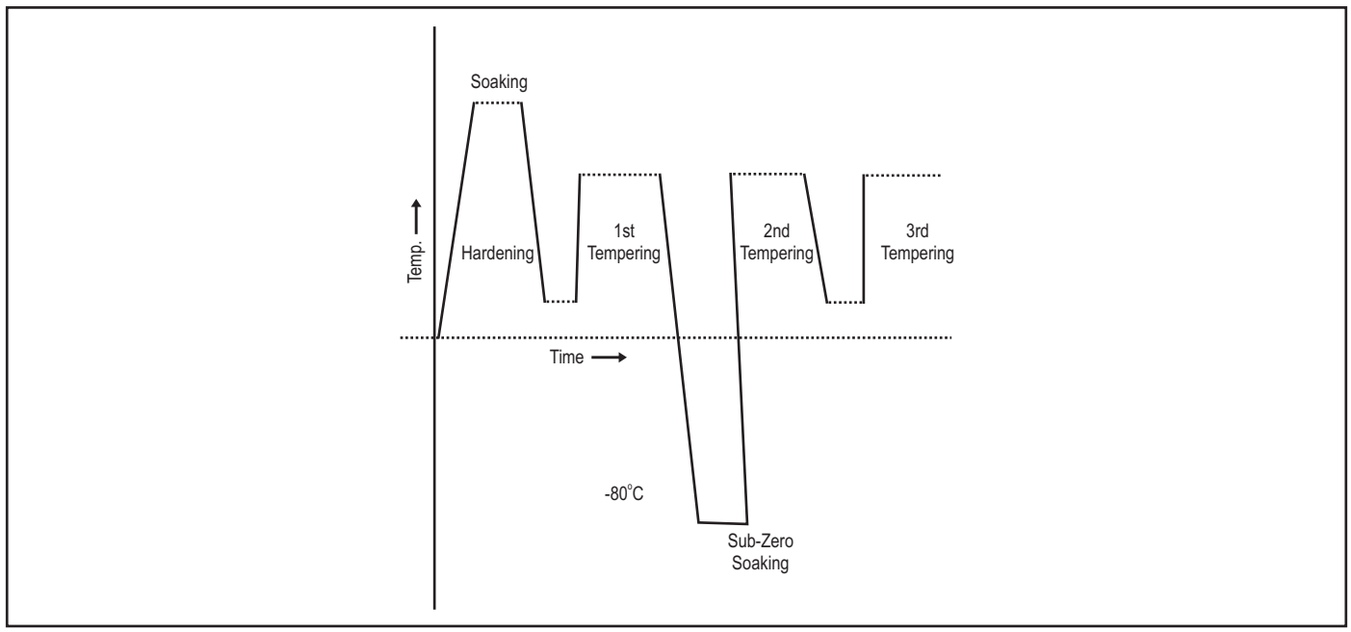
Retained Austenite

PROCESS -

Tools/Rolls are hardened as per normal H.T. Cycle. Then after initial tempering they are cooled to sub-zero temperature i.e. -80°C. At this temperature retained austenite is transformed to martensite. Rolls are held at this temperature for 12 hours. finally rolls go through tempering cycle to attain suitable hardness.

Due to stablisation of metal, stresses and strains are removed and better life is obtained.

Note : *An extension of Subzero treatment is Cryogenic treatment for which steel is taken to -185°C. Results in Cryogenic treatment are 200% of Subzero treatment.*



- Sub-Zero treatment is much useful for D2/D3/HSS steels.
- There should be minimum time gap between initial tempering and Sub-Zero cooling.