
Hardness

- 3/4 hard: Its hardness lies between that of half-hard and full-hard stainless steel. The hardness is achieved through cold working to a certain degree, offering high hardness and strength while retaining some ductility. This makes it suitable for applications requiring high strength and some deformation capability.
- Full hard: This is the state with the highest degree of cold work hardening, featuring maximum hardness. Here, the material has extremely high strength and hardness but very low ductility, making it almost impossible to undergo plastic deformation. It is ideal for situations demanding very high hardness and wear resistance.

Mechanical properties

- 3/4 hard: Tensile and yield strengths are significantly higher than in the soft or half-hard conditions but slightly lower than in the full-hard state. Elongation is generally around 2%-5%, indicating a certain level of toughness.
- Full hard: Tensile and yield strengths are extremely high, but elongation is very low, typically below 2% or even lower. The material is prone to brittle fracture under stress.

Machinability

- 3/4 hard: Welding performance is better than full hard but slightly worse than soft or half-hard. With some ductility remaining, it is important to control the amount of deformation during processes like bending and stretching to avoid cracks.
- Full hard: Welding performance is poor due to high hardness and low ductility, which can lead to welding cracks. However, it has good machinability because the hard and brittle material is easier to machine with better surface finish and dimensional accuracy.

Magnetic properties

- 3/4 hard: Due to cold working, its magnetism is slightly stronger than soft or half-hard conditions but still typically remains low.
- Full hard: Relatively more magnetic, as cold working alters the crystal structure, increasing magnetism.

Applications

- 3/4 hard: Widely used in applications requiring high strength and some toughness, such as automotive parts and mechanical structural components.
- Full hard: Mainly used in special situations demanding very high hardness and wear resistance, such as cutting tools, molds, and knives. These tools need to maintain sharp edges and high hardness to withstand significant friction and wear during use.