

Change of specific volume: The initial specific volume of the same specimen upper mentioned is 0.12798 cm³/g as quenched. Increasing the amount of the applied pressure up to 2000 kg/cm², a monotonous decrease of specific volume is observed up to 0.12789 kg/mm and the slope becomes extremely gentle after about 2000 kg/cm².

Variation of surface hardness: The existence of compressive stress on the surface suggests that the surface hardness and mechanical strength may be increased. In a case of low carbon steel, experiments show that the surface hardness can be increased in every case of changing pressure levels as well as temperature levels of tempering, this is, 2000~6000 kg/mm as pressure level and 100~400°C as temperature level in addition to the level of as quenched. This inclination is held even in the cases of high speed steels and special steels.

Increase of tensile strength, reduction and elongation: These values are increased in nearly same fashion. The slopes before 2000 kg/cm² of applied pressure are steeper than the ones after 2000 kg/cm². In a case of SCM 4 steel (0.4 C, 1.1 Cr, 0.2 Mo) the increment of elongation is observed as much as 20 %. Contradiction between simultaneous increases of hardness and plasticity seems to be contributed to the increment of dislocation generated in the event of changing of the stress distribution.

Effects on impact value: Impact values are also increased but gets remarkable effect by tempering temperature, having the maximum points at about 200°C, indifferent to pressure levels.

Increase of endurance limits: Fatigue test reveals that pressure treatment brings favourable effect on endurance limit.