

# Strange Axle Heat Treatment and Material

Strange Engineering prides itself on supplying the best product for your application. Therefore, when manufacturing axles it is necessary to manufacture two types of axles- thru-hardened **Pro Race Axles** and induction hardened **S/S & S/T Series Axles**. Every Strange axle is manufactured by Strange Engineering from superior grade forgings. Pro Race Axles are made from **Hy-Tuf**, which is a high nickel **Ultra-Strength** steel. S/S & S/T axles are produced from **1550** steel that has been **modified** to Strange Engineering specifications.

## THRU-HARDENED (HY-TUF) VS. INDUCTION HARDENED (1550 MODIFIED)

**Axle Type:** Strange Pro Race Axles and Live Axle Axles

**Heat Treatment:** Thru-Hardened

**Material:** Hy-Tuf Ultra-Strength alloy steel

**Hardness:** Rc 46-48 (full depth)

**Application:** Competitive Drag Racing

Hy-Tuf was originated in the class of **Ultra-Strength** alloys, which was developed for highly stressed landing gear in military aircraft. The material is a low carbon, high manganese, high-nickel and high molybdenum steel.

Each Pro Race Axle is heat treated in a vertical furnace to a hardness of Rc 46-48. The axle is the same hardness from the center of the shaft to the surface (thru-hardened).

The combination of Hy-Tuf and thru-hardened heat treatment provides an axle that achieves superior torsional strength and ductility. In addition, thru-hardened Hy-Tuf is ideal for weight saving gun-drilled and ultra light axles. More drag racers depend on Strange Hy-Tuf Pro Race Axles than all other brands combined.

Pro Race (thru-hardened), S/S and S/T (induction hardened) axles are all **NHRA & IHRA accepted**; however, Strange Engineering maintains the highest standards in the industry for safety and performance. Therefore, we strongly recommend our thru-hardened Pro Race shafts for all competitive drag racing applications.



**Axle Type:** Strange S/S & S/T Axles

**Heat Treatment:** Induction Hardened

**Material:** SAE 1550 (Modified) steel

**Hardness:** Rc 58-62 (hardness decreases from the surface to the axle core)

**Application S/S:** Street use

**Application S/T:** Street/Strip

Induction hardening is a process in which an axle is pulled through an electrical coil. The electric coil heats and quenches the shaft. This type of heat treatment is ideal for hardening the case of the shaft while the axle shaft core and flange remain soft, allowing for an extremely ductile axle.

The combination of SAE 1550 *modified* steel and induction hardening creates an axle which is able to survive the bending loads that are inherent with street use.

The difference between a S/S & S/T axle is the spline (shaft) diameter. S/S axles are 28, 30, 31 & 33-splines and are recommended for street applications in conjunction with lockers and posi-units. S/T axles are 35-splines and are able to withstand high torque and bending loads. S/T axles are ideal for street/strip applications and may be used with lockers, Trac-Lok's or spools.

The induction hardening process has been used for production vehicles for decades. Strange has worked extensively with Ford Racing to provide an optimal depth to hardness ratio. Our effort has created a superior streetable axle.

Some companies have chosen to sell its induction hardened axles as custom alloy race axles - we have not been an industry leader for over 40 years by misleading our customers.



*Axles manufactured for your specific application*

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