

# Cast Cut® #1 Flame Hardening Tool Steel

**Do Not Furnace Harden**  
**Do Not Water Quench**

Developed specifically for automotive Flame Hardening tool construction

TECHNICAL  
DATA

## Characteristics

### Outstanding ease in Flame Hardening

- Will fully harden in air without a water quench.
- Very forgiving material - low operator sensitivity.
- Double the hardenability of SAE J435c/0050A.

### Deep uniform case

- 3/16" to 3/8" in normal practice.
- Will attain 1/2" if necessary.

### High uniform hardness

- 63-64 Rc as quenched.
- 59-61 Rc following 300° F temper.
- May be tempered using a torch and "Tempilstiks" (temperature indicating crayons).

### Strong rigid base structure

- Castings up to 4" approximate cross sections are supplied in the heat treated and double tempered condition at 32-35 Rc and 140 to 160 KSI tensile and compressive strength. This is a 50% approximate increase vs. SAE J435c/0050A (at 90 to 105 KSI tensile and compressive strength).

### Very low distortion during Flame Hardening

- High strength, low transformation temperature and resulting structure contribute to the non-distorting properties.

### Flame Hardening

- Cast Cut® #1 is designed for Flame Hardening only!
- Flame Hardening Temperature 1600° F ± 50° F (preheating not necessary).
- Cast Cut® #1 responds best when allowed to air cool.
- When possible, temper at 300/350° F.
- This may be done in a furnace or with a torch and a "Tempilstik" (temperature indicating crayon).

### Outstanding Weldability

- Cast Cut® #1 coated electrodes and alloy cored wire offer exceptional advantages.
- Cast Cut® #1 welding materials result in a weld deposit chemistry that is identical to the base material.
- The as welded hardness is 55-59 Rc and may be tempered at 1150° F to approximately 36 Rc for machining.

# Characteristics Cont'd

## Outstanding weldability cont'd

- When Flame Hardened, the Cast Cut® #1 weld deposit will react the same as the base material
- The weld deposit will be nearly identical both cosmetically and in terms of chemistry and hardness.
- In an emergency situation, Cast Cut® #1 may be repair welded cold, in the press, using any available tool steel rod. The weld deposit will not be Flame Hardenable.

## Welding

### S.M.A.W. (Stick)

Reverse polarity (DCEP), maintain tight arc, peen after 2-3 inch bead.

#### DIAMETERS:

Inches	M.M.	Amps	Rc Hardness
3/32	2.4	65-70	55-59
1/8	3.2	95-105	55-59
5/32	4.0	135-145	55-59

### G.M.A.W. (Mig)

Reverse Polarity (DCEP)

Shielding Gas: 75% Argon - 25% Co<sup>2</sup>

Peen after 2-3 inch bead

#### Alloy Cored Wire Size

Inches	M.M.	Volts	Amps	Type	Rc Hardness
.045	1.2	16	180	Short arc	55-59

- When necessary, Cast Cut® #1 may be repair welded in the press using Cast Cut® #1 coated electrodes. The as welded hardness will be 55-59 Rc.
- The recommended procedure is to pre heat at 300-350° F, weld and temper the entire section at 1150° F. This may be done in a furnace or with a torch and a "Tempilstik" (Temperature indicating crayon).
- Following machining and refitting, the section may be re-Flame Hardened. The weld deposit and base metal will react identically. The result will be a "new" section.

## Drilling & Tapping

- Best results are obtained with the use of "Chemdraw 1717" cutting oil from:  
Brighton Laboratories  
(810) 632-3045
- and "Rission #888" penetrating lubricating fluid from:  
Rission Group, Inc.  
(313) 581-2620