FAQ'S ABOUT 4130 PIPES

Q. What kind of heat treatment has been done on the tubes?

The tubes are annealed. We can only tell you the temperature at which the tubes are annealed that is 700 Deg Celsius. It is then cut, pickled and lubricated in the acid pool, cold worked to get the final dimension and then layered with anti rust oil. We cannot disclose you the exact time for the cooling period or the temperature hold up period as that makes the steel's strength vary from company to company and is a trade secret of ours.

Q. Do we need to do post-weld heat treatment?

No, you don't have to do post weld heat treatment if you use these tubes. When you use AISI 1010/1020 or commercial grade 4130 whose yield strength are around 350MPa and 450MPa respectively, after welding the strength of the tubes at the HAZ reduces to less than half of the yield strength to about 150MPa. Now since our tubes have a yield strength of 750Mpa after welding it drops to 500Mpa. You can calculate for yourself from the welding test report which is on the website. The load at break of the weld point is way more than your car will ever face in any situation.

You do heat treatment to relieve the residual stresses and to change the micro structure to bring the strength back to normal. So since the drop in strength with these tubes is not that significant, you don't need post weld heat treatment.

There is a risk of Cold Cracking and Hydrogen Embitterment lead fractures when you weld but that is mostly applicable for materialistic steels or very low carbon steel (usually<0.12% C). During welding of these tubes, hydrogen can still seep in at elevated temperatures leading to cracking of the welds. So make sure you take proper precautions. Make sure the inert gas pressure settings are optimal to create a very good envelope during welding and also refrain from continuous welding rather go for segmented approach. Arc welding a strict No. The filler rods have a coating which could lead to deposition of moisture and a subsequent introduction of hydrogen. Whatever the case, the cracks if they develop because of release of gases trapped in the weld will show up after 24 hours. Make sure you do a thorough check up of the welds.

Just a few knocks by a good old ball peen hammer would relieve the stresses, post weld cooling. The chromoly used in NASCAR is a commercial grade 4130 and does need heat treatment at times depending on the wall thickness, the welding setup etc.

Q. Do we need to take any special care during bending?

Yes, it is very important you mention the strength of the tubes to your tube bending guy so that he uses the proper force and uses the proper fixtures. Also, ideally they would heat the bent radius to allow for a smooth bend and avoid tearing at the bent radius.

Q. What kind of filler material do we need to use?

For TIG welding you could use ER70S-2 filler and the same in the spool form for MIG welding. The wire diameter(0.8mm/1.2mm) can be chosen according to the comfort of the welder and the chosen joint.

Q. can we Order Sample of 4130 Before Placing Order.

Yes , we can send 1 meter Sample .

Q. Do we have to Pay for Transportation, Taxes or any other Charges?
No , Charges Provided By us will be Including Transportation , Courier charges , Tax of 5.5 % , packing charges .

Tubing Selection

The 2014 SAE Baja rulebook specifies a standard tubing selection of AISI 1018 steel, with 1-inch outside diameter and a wall thickness of 0.120-inch. However, SAE does allow alternate selections as long as the team uses steel tubing and can prove that their selection has equivalent bending strength and stiffness. The tubing must have a minimum diameter of 0.5-inch and a minimum wall thickness of 0.065-inch. The tubing selection is independent of the frame geometry and thus was a completely separate decision process.

The most common alternate steel choice in the Baja competition is AISI 4130, because it has significantly higher ultimate tensile strength and yield strength than AISI 1018. [2] Both 4130 and 1018 have the same density, but 4130 produces a much stronger frame for the same weight. The equations defining bending stiffness and bending strength are shown below:

$$Stiffness = E \cdot I \tag{1}$$

$$Strength = \frac{S_y \cdot I}{c} \tag{2}$$

Where:

E = Young's modulus

I = second moment of area

S_y = yield strength

c = distance from neutral axis to extreme fiber

[3] Young's modulus is 29,700 ksi for all steels, and the yield strength for AISI 4130 is 63.1 ksi. AISI 1018 has a yield strength of 53.7 ksi. Calculated values for the bending stiffness and strength for the SAE specified tubing as shown in Table 1.

Table 1: Properties of SAE specified AISI 1018 tubing.

Diameter [in]	Wall Thickness [in]	Stiffness [in-lb]	Strength [in^2-lb]
1.000	0.120	971.5	3.513