



# Cryogenics: Facts & Fiction

*by Joseph Chiechi, ProSlot Drag Team*

Exactly what is Cryogenics and how does it apply to slotcar racing?

Cryogenics is the study of low temperature (absolute zero) and its effects on various materials. Basically what happens to parts that are Cryo-treated, is as they are submerged in the liquid gas (Helium-coldest, Hydrogen, and Nitrogen) the actual molecules of the part are condensed making the material denser and more durable. How this could relate to the slotcar industry is as follows:

- 1) The treatment of parts to reduce electrical resistance.
- 2) The treatment of parts to improve durability.

## Electrical Resistance

We decided to do some actual testing to see if the treatment had anything to offer in the way of realistic, verifiable results. We sent 10 different armatures, 12 Parma standard braid, 10 feet of shunt wire, 20 feet of lead wire, 3 pair of Bigfoot II brushes. All parts were checked before and after treatment with a Military spec. Whetstone Bridge at a controlled temperature of 76 degrees F.

<u>BEFORE</u>	<u>AFTER</u>
1) X-12 .234R 11) braid .010R	1) X-12 .234R 11) braid .009R
2) X-12 .234R 12) braid .007R	2) X-12 .234R 12) braid .007R
3) X-12 .235R 13) braid .008R	3) X-12 .234R 13) braid .007R
4) X-12 .234R 14) braid .004R	4) X-12 .233R 14) braid .004R
5) G-20 .150R 15) braid .004R	5) G-20 .150R 15) braid .004R
6) G-20 .150R 16) braid .008R	6) G-20 .149R 16) braid .007R
7) G-20 .150R 17) braid .007R	7) G-20 .150R 17) braid .007R
8) G-20 .150R 18) braid .009R	8) G-20 .150R 18) braid .008R
9) H-27 .146R 19) braid .009R	9) H-27 .146R 19) braid .007R
10)H-27 .146R 20) braid .011R	10) H-27 .146R 20) braid .008R

21) braid .008R 22) braid .009R	21) braid .008R 22) braid .008R
23) 10ft shunt wire .470R 24) 20ft lead wire 1.223R	23) 10ft shunt wire .462R 24) 20ft lead wire 1.216R
25) brush .003R 28) brush .003R 26) brush .003R 29) brush .002R 27) brush .003R 30) brush .003R	25) brush .003R 28) brush .002R 26) brush .003R 29) brush .002R 27) brush .003R 30) brush .003R

As can be seen from the results, there was little or no improvement in the resistance of the treated parts with the exception of the braid. It seems to have improved the bad reading braid and not effected the good reading braid. The armatures were track tested in one blueprinted setup and one car in the same afternoon.

There were 6 passes made on each arm before changing and in all but 2 cases the performance was unchanged over untreated arms. The 2 arms that ran different were the #3 X-12 and the #7 G-20. Both arms ran slow, about .020 slower than the 6 pass average of the worst of the untreated arms. I then took one car and made 6 passes for an average of .907et. I then changed the brushes, shunt wire, lead wire, and braid on the car and made 6 more passes for an average of .909et. There was no improvement with the treated parts.

## **DURABILITY**

We sent in 4 Sonic aluminum tri-lite spur gears to be treated for a durability test.

We have had a problem with shearing teeth off the gears and thought this would be a good test. All 4 treated gears were installed on 4 different AA/FCs. All 4 gears lasted more than twice as long as untreated gears. In fact, only one gear sheared a tooth. The other three just plain wore out.

We also sent in 12 comms to be treated and checked for durability. There was no improvement in hardness or machine ability and in run testing the comms showed no wear improvement at all.

## **SUMMARY**

In summary, while the theory is sound, our tests did not show any practical improvement electrically in treating any of the motor parts or wiring. The aluminum parts responded well to the treatment and would probability be worth the expense to treat chassis and gears. Magnets were not treated because the lab for-warned us that if there was any kind of flaw in the magnet material it would shatter during cool down.

We chose not to treat our cans to avoid the risk of changing the magnetic properties of the selected material. As always the racer has the choice. I know race teams that treat

every part on all of their cars and they are no faster than we are and in some classes a lot slower and we don't treat anything at all. I personally would spend the money on something with more tangible results. As always the final choice is yours, just think smart and don't fall for the hype.ProSlot Ltd.

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