

◆ THE EDM-ER ◆

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Common Wire Problems & Troubleshooting Part 1

Nothing on the machine is more irritating or disrupting than wire problems. Many times they are the most difficult to troubleshoot as they have many causes and at times are related to something far from the cutting area.

The most common is: Wire Breaking.

Wire breakage around the guide area can be caused by a dirty wire guide, holding force to the guide is too high or the positioning of the guide is inadequate.

Wire breakage at idle can be caused by poor wire hooking or a potentially cross wound / tangled spool.

Wire breakage at the start of the cut within the first 3/16" can be caused by air pockets in the dielectric or improper flushing pressures.

Wire breakage after cutting more than 3/16" can have the following causes; flushing pressure is too low, not enough volume of dielectric, foreign material or pin holes exist in the material to be cut, defective wire, defective or dirty polyurethane rollers, improper roller tension.

Surface finish problems resulting in:

Rough surface or "saw" marks can be caused by uneven discharge needing a faster wire speed rate.

Wire marks on the cutting surface requires a higher wire tension or an index of the power feeds. Instability of the cutting speed require us to look at the resin system and stabilize the conductivity.

Check, clean and perform maintenance on the wire guide system. Check, clean and perform maintenance of the feed exhausting system. Check the poly rollers for cracks, dirt or a friction problem. And finally look

for improper wire tension.

Failure of the Automatic Threading System, (IE: Cutting Failure)

Uneven cutting or the creation of a burr requiring the adjustment of cutting pressures or replacement of the cutters.

Rolling up of the cut end of wire requires a replacement of the cutters.

Wire will not thread into the lower guide can be caused by wire with a large curl look at the straightness of the wire.

In annealing system type cutters: Review and adjust the input wire diameter to meet material and characteristics as determined by the edm manufacture.

In the case of poor cutting, review the wire diameter input to match wire diameter being used. If the cutting position varies review the wire type as it may be incorrect.

Failure of the Automatic Threading System, (IE: Completion of the threading process)

Review maintenance records and assure proper cleaning, this is the most common reason for wire

threading failure.

Lower guide diameter (work side) is too small for the wire attempting to be threaded.

The pressure and volume of the water jet is insufficient or declines as the process continues. Verify pressure setting as related to wire diameter.

Improper positioning of the upper and lower heads. Check the program and perform central positioning or alignment function.

The wire has a large curl requiring replacement of the wire.

Wire evacuation problems specifically in the scrap box (bird nesting)

Uneven remnant stress of the wire can be resolved by increasing the TAP by 1 (higher cutting speed) or by slowing the feeding rate.

Uneven wear on the conveyor roller belt, replace when abrasion exceeds 1/3 of wire diameter.

Verify and check the positioning of the conveyor roller belt.

Improper pressure applied by the conveyor belt of roller system, adjust to fit wire diameter and characteristics.

Wire has a large curl requiring replacement of the wire.

We hope that this information



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EDM Oil

What's the real story?

The purpose of this article is to briefly cover some common miss conceptions regarding EDM oils. Future articles will be more substantive and detailed.

Generally speaking petroleum EDM fluids have a usable life of 3 to 5 years. Highly refined oils including semi-synthetics average 7 years. True synthetics have a life of over 25 years.

It is critical that your oil be designed for EDM. Too many oil refiners and blenders have byproducts that are sold as EDM fluids but were never intended or designed to be an EDM fluid. These fluids are paraffinic, aromatic or naphthenic based. These type oils produce vapors that are carcinogenic. Vapors that operators breath every day, all day long. The couple of dollars saved are not worth the potential damage that can be done to an unsuspecting operator.

Operator dermatitis, the red rash and de-fatting of the skin, is a good indication that your oil has exceeded its usable life or you are using an oil well below the quality for EDM operations.

From a cost standpoint low grade oils cost more in excessive electrode wear, reduction in filter life, increased machine wear and the smoke / smell throughout your shop.

Our next issue will deal with the technical aspects of EDM oil.

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