

## Let's Discuss Aluminum Evaporants

*Published now and again*

*by MIDWEST TUNGSTEN SERVICE*

**Q:** I'm doing shielding work. How can I deposit more aluminum?

**A:** If you have enough room and power, you should add more filaments rather than just increase the amount of aluminum in each filament. This will have the added benefit of providing more uniform coverage on the parts. You might also want to consider a filament and evaporant combination specifically designed to deposit the required amount of aluminum.

**Q:** Wouldn't it be easier and cheaper to just add more aluminum to my current filaments?

**A:** Maybe. Many filaments can deposit as much as 15% of their own weight under ideal conditions. Filament life, however, begins to decline above 10%. Physically damaging the filaments is more likely when loading multiple charges in each filament. A significant portion of the second or third cane usually ends up dripping off the filament or balling up in the filament rather than depositing on the parts.

**Q:** Aren't specialized filaments and evaporants expensive?

**A:** Sometimes specialized products actually cost less. If a smaller specialized filament or evaporant can do the same job as a large standard product, you save money. However, specialized products may cost slightly more to produce than standard products if they are made in smaller quantities. The higher cost is often outweighed by increased filament life, less evaporant loss, and lower scrap when the filament/evaporant combination is optimized for a job.

**Q:** How are specialized designs determined?

**A:** Some companies design their own filaments and evaporants, but usually MTS will design them after consulting with a company to determine how to best meet their requirements. This service is free of charge.

**Q:** Does using specialized products increase my delivery time?

**A:** MTS has very short lead times for all products, including specialized filaments and evaporants. On occasion, a first time order may have a longer lead time because of tooling requirements or raw material delivery, but subsequent orders would be the same as for standard products.



**Q:** Why are some canes made from flat wire and others made from round wire that is stamped flat?

**A:** The hooks of the canes melt and wet better when using flat wire. The flat wire provides two contact points with the filament, whereas the round wire only has one. The double contact reduces the tendency of the cane hooks to drop off during firing. The stamping of the round wire can also embed impurities in the wire if the equipment is not clean. On the other hand, canes which are stamped show the milligram weight on them. We manufacture both types of canes, you decide which you prefer.

**Q:** I have a lot of balling and dripping of aluminum from my filaments, what should I do?

**A:** Since balling of aluminum can shorten filament life and drips can damage your parts, you should immediately work to eliminate this condition. Your firing sequence needs adjustment, or you are trying to deposit too much aluminum from your filament. Check that the evaporant weight is less than 15% of the filament weight. If you use a preheat in your cycle, it should not be long enough or hot enough to allow the aluminum to completely melt and flow to the bottom of the filament. The cane should just begin to melt before transitioning to the quickest possible firing.

**Q:** Should I clean my evaporants prior to using them?

**A:** All MTS evaporants are cleaned prior to shipment. All that is required of you is to keep them clean, dry, and sealed when not in use. You may want to have your staff use white cotton gloves when loading filaments to avoid any contamination caused by sweat or hand oils. All aluminum develops a slight surface oxidation on exposure to air. This is not a problem. If evaporants sit for years prior to use, contact us for cleaning instructions.

**Q:** Should my aluminum be 99.99% pure?

**A:** This depends on the application, of course. For decorative and shielding work, 99.9% is sufficient in most all cases. The deposited aluminum is actually more pure than the original cane material. Most of the problems suspected to be caused by aluminum purity turn out to be the result of something else. There is no benefit to paying for a higher purity than your application requires.

**Q:** What if I need to deposit something besides aluminum?

**A:** From a deposition point of view, aluminum is much easier than most metals due to its low density and evaporation temperature. It is possible to deposit other metals and metal alloys such as copper, nickel, nichrome, aluminum bronze, to name a few. MTS manufactures evaporants in all of these metals. Call us to discuss the details.

*For more information of aluminum evaporants or to discuss your application, call us.*

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