Boolit casters typically use dirty, contaminated scrap from whatever source we can scrounge up, and that sort of stuff needs special attention to make the best boolits. Clean alloy like nuclear medicine shields or foundry alloy doesn't require as much cleaning.

We need to do three things to our alloy: Clean, reduce oxides, and flux.

Cleaning is accomplished by mechanical action, stirring and skimming dirt, sand, steel clips, rust flakes, copper jackets, whatever. A slotted spoon is adequate.

Oxide reduction is next. We need to deal with the oxide dross formation on top of the metal, whether in smelting pot, or a freshly-melted casting pot full of clean ingots. Boolit alloy dross is very rich in valuable tin, so we need to turn it back into useable metal rather than skim and toss it. The opposite of oxidation is a chemical process called "reduction", so if we induce a reduction/oxidation reaction on top of the metal, we can save the scum. Combustion is a redox reaction. Anything that will burn will trade electrons with the oxidized metal, sort of "stealing" the oxygen and freeing the tin and other metals from the scum so they go back into the alloy. Grease, wax, oil, sawdust, anything like that will work to reduce oxides, and if your alloy is clean of other contaminating metals waxes work fine for this job.

Now, about **Fluxing**. This is the part that seems to confuse everyone. If your alloy came from wheel weights or other dirty scrap, it likely contains a bunch of other metals that don't cast very well and mess up the flow, or FLUX, of the alloy. This makes it tough to cast good boolits. Things we want to get rid of are zinc, aluminum, iron, calcium, and a few others. Since what we want to get rid of is all pretty much more difficult to reduce than lead, tin, and antimony, we can remove it through adsorption. With a "d". Things that work really well at removing the oxides of contaminating metals are molten borate glass and the carbohydrates in wood. Wax won't do it. The problem with borates (such as Marvellux) is that they don't reduce any of the oxides at all, including tin, they just adsorb them and remove them from the alloy. If you want to save your tin/antimony/bismuth/lead oxides, use sawdust because it saves the good stuff and adsorbs the bad stuff so it can be skimmed and thrown away with the ash when it has finished burning.

So again, sawdust, being a hydrocarbon, will also reduce tin/lead/antimony oxides we want to save while adsorbing the remainder of the junk we want to remove and capturing it in the ash. Two for one, so to speak. Resiny, pine sawdust, particularly sappy yellow pine, is one of the best reducant/fluxes I have ever used because the resin is such a fine and quick sacrificial reducant, quickly reducing the good stuff so it won't get adsorbed, but leaving the oxidized trash

metals for the carbon to soak up as the wood chars.

Sawdust and ash cannot get below the surface of the melt and cause problems unless you drag it down there physically so that it gets trapped below the surface tension of the alloy at the bottom of the pot. Carrying ash down there on the end of a fresh ingot, a handful of sprues, or by scratching around on the bottom of the pot with a wooden stick are the principle ways of getting ash junk on the bottom where it will migrate to the spout and cause inclusions in the boolits. Use common sense and it won't happen. A wood stick is the bee's knees for scraping all the stuck, baked dross off the sides of the casting pot, it reduces oxides on contact.

Gear (AKA Ian)