



Boiler Saver by Steve Leatherman

P.O. Box 183, Trumbauersville, PA 18970

SteveL@boilersaver.com

(610) 342-7577

Terlyn LSB 4000 Instruction

Use the cleanest, most mineral free water available for best results.

If your water is soft, use half these doses.

If you want some extra cleaning, use more treatment.

Use an activated carbon filter to remove chlorine for best results.

When filling the boiler:

- Add 2oz. per each 100 gallons directly to the boiler.
- Don't add it first, as it may go directly to a blowdown line, add it while filling.
- Don't be concerned if it is a little more, **Terlyn LSB 4000** is easy and forgiving.

For each **fill of the feedwater**, add 4 ounces per 1,000 gallons to the tank as you are filling. For smaller tanks use 1 capful (0.4 oz) per hundred gallons. The incoming water will mix the **Terlyn LSB 4000** evenly.

Do not let **Terlyn LSB 4000** treated water stand more than a day in your feed tank. The chemical will break down if exposed to air. Engineers who have done this will complain that "the water or boiler acts *funny*" for the first few hours, until some fresh treatment is added. Don't let this happen to you.

Steam the boiler the same day you fill it. After the boiler is making steam, blow the whistle, run the blower or lift the safety to let the oxygen that was in the water out of the boiler. Likewise, after injecting water into a steaming boiler, make sure you let off some steam as the pressure starts to rise. When shutting down and topping up the water level, burp some steam out to clear the oxygen (in the cold water) out of the boiler. These steps will help prevent oxygen pitting.

Also (and very important), never let a boiler stand with cold water in it or damp, for more than 2 or 3 days, unless protected by oxygen scavenger. Oxygen pitting is the biggest destroyer of boilers that sit cold. Oxygen gets in when the steam condenses and pulls a vacuum. This oxygen immediately starts pitting the metal. Having some treatment in the water helps hold it off, but not

forever. If nothing else, fire your boiler up to steaming every week to drive the oxygen out of the water. Options are to use RustStop 85 or a nitrogen gas inerting blanket on the boiler to keep oxygen out, contact me for details.

Keep the cap on tightly, do not allow Terlyn LSB 4000 to freeze or store in direct sunlight or Ultraviolet light. This will degrade the treatment.

Ongoing experience with vertical boilers and condensate returns shows that adding an 8oz. cup of household Ammonia with **Terlyn LSB 4000** raises the pH of steam and condensate. This will minimize corrosion from carbon dioxide in the steam.

Listen to the sound of the cylinder exhaust and whistle. If it is sharp, the steam is dry, and you are doing fine. If the sound starts to get a little mushy or wet, there is some carryover, the steam is wet and the boiler needs a blowdown to get rid of concentrated salts, minerals and used-up treatment. This is absolutely normal and is a part of operating every boiler, from tabletop models to big electric generating units. This is the result of the treatment removing old deposits and the natural “cycling up” of dissolved salts and minerals in the water. Steam is fairly pure distilled water. The salts and minerals stay behind in the boiler. It is expected to happen fairly quickly and often in the first days of treatment and cleaning.

If three blowdowns in a day are needed, then drain and wash the boiler and start again from refilling and adding **Terlyn LSB 4000** as described above. With continued use, your boiler will soon get past this stage and be whistle clean.

If you want to have a scientific and predictable method, a pocket sized conductivity/Total Dissolved Solids instrument is available. Control TDS at 1,500ppm to start. As your boiler gets cleaner, work the TDS upward in steps to 5,000ppm. Everyday users, like excursion RR's and park trains, operate up to 7,000ppm TDS. This represents a significant savings in fuel, water and treatment. Your conditions may vary; Experiment and find out what works!

Check the pH of your boiler water after a day of steaming. We do want the pH to settle-in around 10. Most local pool, spa and agricultural supply stores have pH kits available. Depending on your water supply, some supplemental treatment with Soda Ash may be required. Contact me if you need help with this.

Terlyn LSB 4000 treatment will cause a general loosening of the old scale deposits. The rate of this loosening and cleaning is determined by the amount used. You will have to open the boiler and wash out the loosened debris after the first few days of steaming on a very dirty boiler. Use the recommended dose when filling the boiler with water and when adding makeup water. When steaming, do not blow down from the bottom unless the boiler needs it, as described above. Do blow down to clean and prove the sight glass and try cocks. Keep the **Terlyn LSB 4000** in the boiler where it can work for you.

Why is it important to have a clean boiler? Everyone knows that scale kills heat transfer. The most important thing, in the long run, is that scale holds moisture from the air, along with corrosive pitting chemicals like chlorides, in perfect contact with the boiler metal. The rusting and pitting gets going under the deposits and in the crevices. With a quick look, the boiler appears clean, but it is still being pitted and destroyed under that scale. **Terlyn LSB 4000** forms a protective film called ferrous hydroxide that will protect the boiler if you help it along.

The results will be visible when you open and clean your boiler. Open all hand holes and aggressively clean all areas inside, top to bottom. Clean out all soot and ashes from the fireside, flues and smokebox.

Do not let any debris, mud or water standing in crevices. A clean and dry boiler will last much longer and perform better. Oil is permissible on the fire side to protect the metal, but not on the water side. Do not use dirty motor oil, it contains acids that will corrode the boiler metal.

There are over 10,000 hobby and commercial steam users of **Terlyn LSB 4000**. If you ever have any questions, comments or concerns, please feel free to contact us for help and advice.