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Pro98® Product Notes

Special instructions (supplements standard Pro98® instruction sheets)

Scope

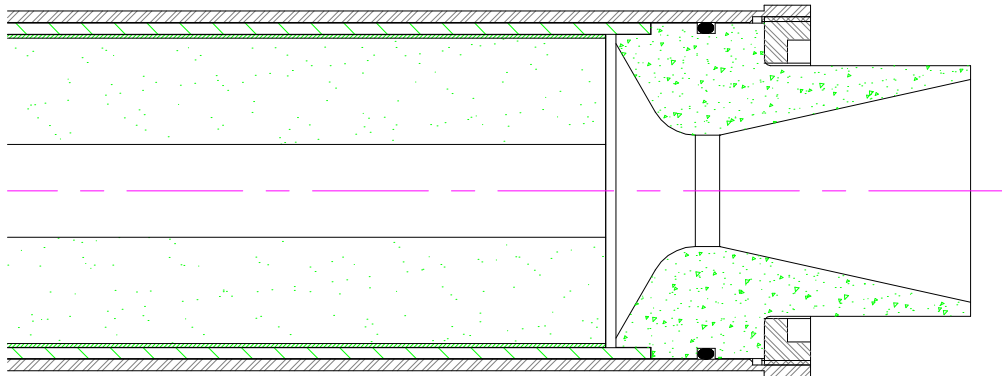
These notes supplement the standard Pro98® instructions for the following motors:

- Pro98® motors with XL-style nozzle (M3400, M4770, N2850, N2900, N3180, N3301, N3400, N3800, N4100, N5800, N10,000)
- All Pro98® - 6GXL motors
- Pro98® - 6GXL Blue Streak™ - N3800
- Pro98® - 6GXL C-Star™ - N5800
- Pro98® - 6G Vmax™ - N10,000

This note also explains the proper use of the Pro98® casing spacer.

Pro98® loads with XL-style nozzle: M3400, M4770, N2850, N2900, N3180, N3301, N3400, N3800, N4100, N5800, N10,000

The M3400, M4770, N2850, N2900, N3180, N3301, N3400, N3800, N4100, N5800 and N10000 Pro98® motors use a XL-style nozzle. This is a larger nozzle than used by other Pro98® -motors. For these motors, simply leave out the nozzle carrier, and install the nozzle without the carrier. The larger o-ring that normally goes on the outside of the carrier goes directly onto the large nozzle. The smaller o-ring, if included in the package, is not required. The drawing below shows the XL-style nozzle located inside the motor and retained by the threaded retainer ring.



Assembled Pro98® motor with XL-style nozzle. Note the single o-ring and the lack of the nozzle carrier. The nozzle is retained by the threaded retaining ring only. The o-ring is installed directly on the nozzle.

Pro98® - 6GXL motor liners

All Pro98-6GXL motors come with the forward insulator plate bonded to the liner assembly. This is required for proper sealing of the motor at the forward end. Ensure that the forward insulator plate is bonded properly, and leave it in place. Remove the nozzle, and load the grains from the other end.

Pro98® motors requiring grain bonding: M3400, N2501, N3301, N3800, N5800 and N10000

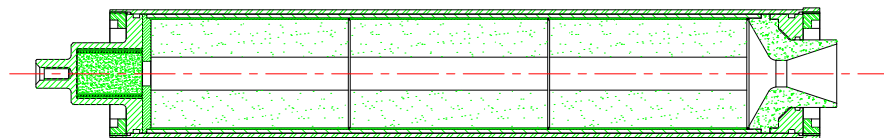
The following motors require bonding of the grains into the liner: M3400 White Thunder™, N2501 and N3301 White™, N3800 Blue Streak™, N5800 C-Star™ and N10,000 Vmax™. Bonding the grains in the liner prevents premature blowout of the grains under high acceleration loads or by high core mass flows. Note the special 'base grain' for the N2501 and N3301 motors. These grains should be installed at the nozzle end. The N10,000 motors come with an adhesive kit. For all other motors use a foaming polyurethane glue such as Gorilla Polyurethane Glue or Elmer's Glue-All Max. A single 2-oz bottle is sufficient for all Pro98 motors and it is not supplied. When bonding with urethane, it is suggested to **slightly** dampen the outside of the paper propellant liner with a damp rag to improve bonding. **DO NOT SOAK!** Do not wet the outside of the grains of the N10,000 motors when using the 2-parts supplied adhesive. The process for bonding the grains is as follows:

1. Open all grain packages and the liner inert kit. Verify that all required parts are present.
2. Wear gloves during the bonding process!
3. For N10,000 only:
 1. Open the adhesive kit.
 2. Empty the contents of the hardener bottle (dark brown fluid) into the main adhesive bottle.
 3. Use the supplied stirring stick and stir for at least two minutes.
4. Apply adhesive on the outside (paper liner) of the first grain using the supplied brush. Ensure no adhesive is applied on the grain faces or bore of the propellant. N10,000 only: Also coat the edge of the paper.
5. Push the grain in the liner from the nozzle end while twisting it. Twisting the grain while inserting it will properly distribute the adhesive. Push it about 1" into the liner.
6. Install a grain spacer o-ring.
7. Repeat steps 7 and 8 for all six grains. Excess adhesive might be scraped off around the end of the liner. This can simply be wiped off.
8. Do not install a spacer o-ring between the bottom grain and the nozzle. 5 spacer o-rings will be used in total; one between each grain.
9. Re-install the nozzle and wipe off any excess adhesive.
10. Set the liner/grain assembly upright with the nozzle facing down.
11. Push the top grain down gently through the hole in the forward insulator plate.
12. Let the liner/grain assembly cure in an upright position
13. Continue with the regular assembly process as outlined in the instructions.

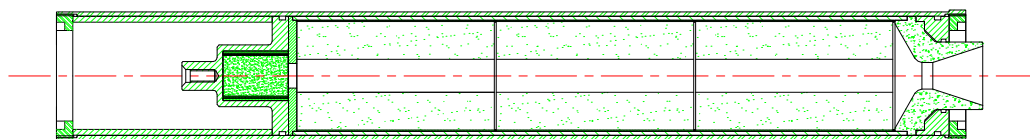
When installing the liner in the casing it is important to fill the gap between the liner and the ID of the casing with grease. Grease the outside of the liner with an ample amount of grease before installing it in the casing. While insert the liner/grain/nozzle assembly into the casing the grease should be scraped off the casing. This will minimize the blow-by of hot propellant gasses at ignition.

Pro98® casing spacers

Pro98® casing spacers allow the use of a reload kit intended for a smaller casing size to be used in the next casing size up. For example, a 3-grain reload kit can be used in a 4-grain casing. When assembling a Pro98® motor with a casing spacer, follow the regular instructions provided with the reload kit, and install the casing spacer between the forward closure and forward closure retaining ring as shown in the example below.



Pro98®-3G reload in Pro98®-3G casing.



Pro98®-3G reload in Pro98®-4G casing using case spacer.