Why do larger containers of UV ink have a shorter shelf life?
It’s all about oxygen.

It seems counterintuitive that a larger container of UV ink has a shorter shelf life than a smaller one. The factor that makes the difference is oxygen, which acts to stabilize UV inks. Our plastic containers used for quarts, liters (1 and 5 liter) and gallons allow oxygen (but not UV light) to pass through, and with a smaller mass of ink the oxygen can permeate through the ink completely. An ink that can receive oxygen will last longer than an ink that cannot get oxygen. Most Nazdar Screen UV inks in quart, kilogram, or gallon containers will last about two years, while five-gallon containers have a six-month shelf life; 55-gallon containers have a 3-month shelf life (see figure 1). Due to differences in chemistry and packaging, UV inkjet inks have a different set of shelf life details, described in the section below.

Why do UV inkjet inks in small packages not follow these same rules?

For UV inkjet inks, the differences in chemistry give our 1-liter and 5-liter packages a 12-month shelf life. This is due to the very precise viscosities that inkjet inks must maintain while on the shelf. If screen ink drifts 250 centipoise in 12 months, it is still well within its usable range. If an inkjet ink drifts more than 2-3 centipoise, it starts to cause difficulties with the printing equipment.

For our 1 and 5-liter bottles, as well as our 2 and 3-liter bags, we supplement the oxygen that penetrates the packaging with some additional oxygen left in the container when they are filled. This helps further stabilize the ink while it waits to be installed in a printer. Our portfolio also includes packages of UV inks in 220 and 440-milliliter cartridges, which unfortunately require that all the oxygen be removed during the filling operation. This removal of the oxygen reduces the shelf life of ink in cartridges to only 6 months.

Figure 1

The illustration at left shows the way oxygen penetrates a container of ink. The blue circle shows the center of the ink mass, which is the same size in each container. The orange arrow represents oxygen penetrating the container. As you can see, the large volume of ink keeps oxygen from reaching the center of the large container. The oxygen can’t stabilize the ink in the middle, so the ink starts to react and the result is a gel-ball in the center of the container.

This illustration shows why we use specific plastic containers for the 1 KG, 1 LT, 1 GL, and 5 LT, UV inks, and why we have a shorter shelf life for the larger units. You can click here to see the Shelf Stability Chart or click here to Calculate the Shelf Stability of a Nazdar ink.