

BY DAN KAY

**Q:** I am wondering whether there is an industry standard dealing with the shelf life of brazing pastes. I notice that manufacturers of brazing pastes seem to use different statements on their products, some giving a shelf life of up to two years, while others merely specify a date of manufacture. Since I'm working in a critical environment, how can I know when a brazing paste is actually no longer good or out of date if the manufacturer doesn't print an actual shelf life date on their containers?

**A:** I am not aware of any industry standard that has guidelines dealing with the shelf life or expiration dates of brazing pastes.

Note that each manufacturer uses its own proprietary formulas for producing their paste binders, and thus each will have different criteria for setting shelf life or expiration dates for their brazing filler metal (BFM) pastes. Shelf lives can vary from as little as 90 days up to 2 years, depending on the manufacturer, specific type of BFM powder, formula of the

paste-binder system used, and the percentage of binder-system added to make the paste — which can range from as much as 40% down to as little as 5% paste-binder — Fig. 1.

It should be noted, too, that some manufacturers have stopped showing an expiration date on their BFM paste containers altogether, but instead, merely show a “date-of-manufacture,” because of these many variables just described.

Be aware, too, that any so-called “shelf-life” of a brazing paste will also depend a lot on you, the end user, since the conditions in your brazing shop can, and will, have a major impact on the life of the BFM paste. Do you keep each paste container/cartridge tightly closed when it is not in use? Do you keep them stored in closed boxes at reasonable ambient temperatures in a cool storage room, or are the containers left out on benches in very warm conditions in the brazing area where their liquid content can more easily dry out, or their contents become contaminated by dust, dirt, or oil in the shop air? Always strive to keep the



*Fig. 1 — An assortment of brazing paste products labeled with the date of manufacture and a “use before” date. Photo courtesy of Sulzer Metco.*

containers closed and stored in safe, comfortable ambient conditions.

An interesting situation developed a number of years ago that impacted the printing of shelf-life dates on BFM paste containers/cartridges. It involved customers purchasing in larger quantities than they needed merely to get a better price discount. Some of these end users returned perfectly good brazing paste to the manufacturer simply because the shelf life date printed on the unused paste had been reached. As a result, one manufacturer started printing “minimum shelf-life nine months” on the paste containers to encourage end users to continue to use the paste after the nine-months time was reached. However, auditors did not know how to interpret this, and so, disallowed the use of any of those paste containers after the nine-months had past. Other manufacturers merely extended their shelf-life dates so that they would get fewer returns from the field based on the expiration date.

In my opinion, brazing paste manufacturers do not fully understand all the potential reactions that can occur between the brazing metal powders and the paste binder systems in which they are mixed to suspend those powders. Yes, the products offered by reputable BFM-paste manufacturers usually remain quite stable until they are used by the customer, but occasionally a batch of brazing paste separates out prematurely in the field. The paste user notices a thick layer of liquid above the brazing powder and may not know what to do with the container (or cartridge). They may reject



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it and return it to the manufacturer, or they may pour off the liquid and try to use the remainder of the paste. Note, it is never recommended to pour off the liquid from the paste. The liquid should be mixed thoroughly back into the paste, either by hand or by machine blending.

I recommend the following three steps to determine whether a brazing paste is suitable for use after its published shelf life:

1. Call the manufacturer to get the company's interpretation of the expiration dates for their pastes, and ask what they suggest be done with brazing pastes after those dates. If you can, get a statement in writing describing the maximum shelf life they would allow or guarantee for their pastes.

2. Test the "creaminess" of the BFM pastes that are nearing their expiration dates. I did this by extruding a tiny amount of paste out of the end of the paste cartridge. As long as the paste was still extrudable and creamy, I would use it in our brazing shop for our general brazing needs. Obviously, for special projects requiring use of only materials that were still within the printed shelf-life guidelines on the containers I could not do that, since no so-called "expired" material should ever be used on such projects no matter how good the paste might still be. With today's traceability needs, any use of a BFM paste that has officially "expired" or gone beyond its printed shelf life could cause that brazing shop to put themselves in jeopardy should something go wrong with the brazement in service, even if the BFM paste performed perfectly well.

3. Check the color of the brazing paste that you extrude. Has it turned much darker compared to the original paste? Is the chemistry of the BFM components in the paste such that upon long exposure to the paste binders, or to hot shop conditions, etc., the BFM powder itself may become oxidized to the extent that it will no longer melt and flow properly when heated to brazing temperature? This might be the case when the BFM powder contains significant percentages of oxidation-sensitive metals such as chromium, copper, titanium, or aluminum.

I had no problem using an older paste that met these three criteria for a variety of noncritical commercial brazements.

The BFM powder in the brazing paste does not suddenly "go bad" just because it has reached the expiration date. In fact, even if it is older than the printed shelf life on the container, it can, as described in this article, still be used until it

is all gone, as long as the end use criteria allow it. It's not like food, where expiration dates should be carefully followed for health reasons. Brazing paste expiration dates usually represent the limit of a manufacturer's guarantee to replace the materials IF it should separate out from its binder system and settle in the bottom of the container, thus becoming more difficult to work with.

Note that the plastic cartridge or pail holding the paste does "breathe" to some extent allowing a small amount of air-exchange through the walls, around the end piston, etc., that can cause the paste to dry out. It is not recommended to merely add water. Brazing filler metal paste that has dried to a much higher viscosity can be reconstituted to a creamier state by mixing in some extra "binder," which can be purchased as a separate product from various BFM suppliers. ♦

*This column is written sequentially by TIM P. HIRTHE, ALEXANDER E. SHAPIRO, and DAN KAY. Hirthe and Shapiro are members of and Kay is an advisor to the C3 Committee on Brazing and Soldering. All three have contributed to the 5th edition of AWS Brazing Handbook.*

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