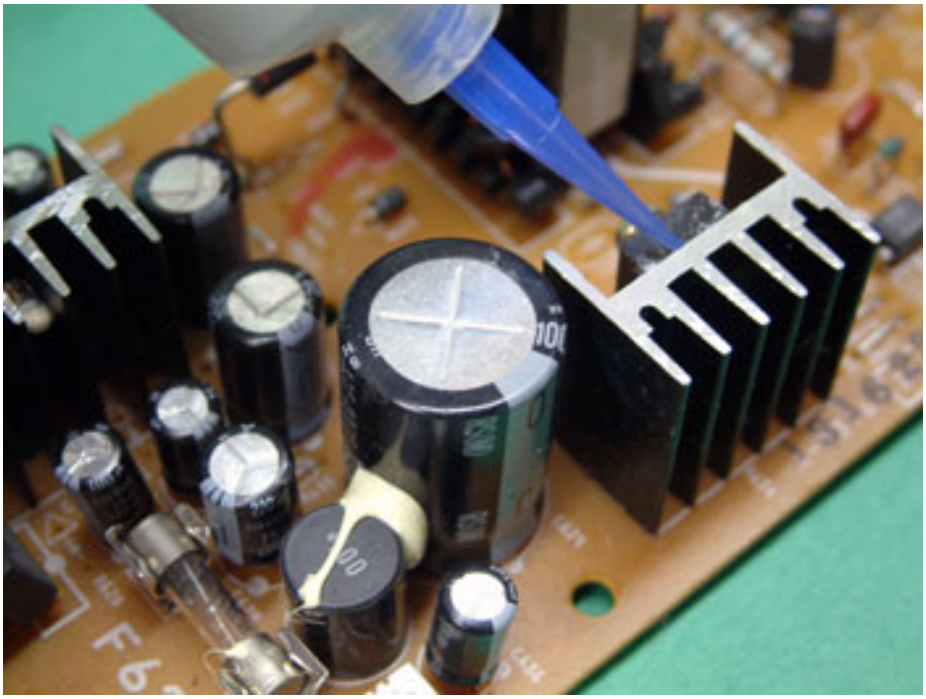
An Education In Adhesives



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One of the most current critical issues relating to adhesives and sealants has to do with product continuity.

Suppliers of adhesives and sealants are oftentimes not taking the time and energy required to examine user applications in detail, or they lack the expertise. In the end, they are often prescribing the incorrect compound for the customer.

We also see the number of reliable suppliers dwindling. Added competition and keeping up with regulatory requirements is corroding profitability, and in the meantime, the large companies are not geared towards servicing one-on-one solutions in small lots.

On a more practical level, common errors in the use of adhesives and sealants typically include the following:

- Improper mixing.
- Faulty curing.
- Poor surface preparation.
- The application of bond lines that are too thin- i.e. less that 4 to 6 thousandths, often as a result of excessive squeeze out which, again, is often caused by incorrect fixturing.

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Critical Considerations

One of the most current critical issues relating to adhesives and sealants has to do with product continuity. In the ongoing restructuring of the worldwide chemical industry numerous companies are disappearing or being acquired, while the stalwarts, trying to cope with a changing chemical and regulatory environment, are constantly readjusting their portfolio focus and are phasing out products.

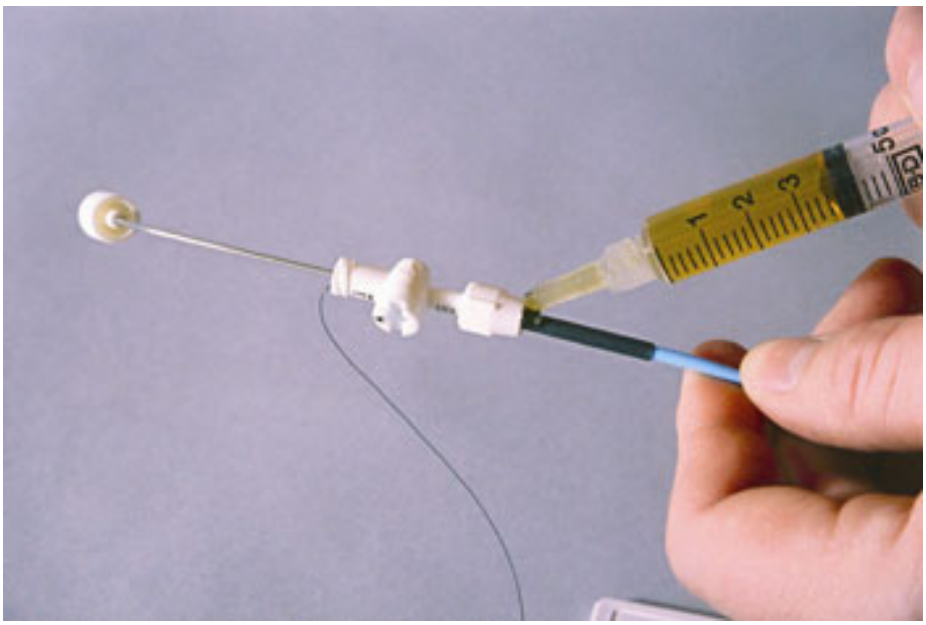
As the number of chemical suppliers in the industry is being reduced, the variety of available chemicals is also shrinking. As a result, the polymer formulators are forced to discontinue products already specified. In addition, stricter safety, environmental, and transportation regulations deprecate the use of a wide range of chemicals formerly used by the formulators to concoct their proprietary compounds.

This means that re-testing is required to qualify the substitute, inevitably throwing deadlines off kilter. For other chemicals the minimum batch sizes have been increased, stretching the formulators lead times from days out, to two or three weeks.

Other pressing customer issues relate to ease of application. Users are less willing to get involved with things like weighing, mixing, and degassing, and are less willing to play around with spatulas and brushes to apply the compounds, or use thinners to clean up afterwards.

Users are most interested in compounds which are hazard-free, environmentally friendly, odorless, and require no necessary clean-up. Yet, adhesive performance specifications, rather than being relaxed, are becoming more demanding. Still, there are ways to take a smart approach to choosing right.

The foremost factor is correctly defining the industrial environment, i.e. what does the application entail? What data is required?



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Know Your Stuff: An Adhesives & Sealants Checklist

Maintenance, repair, and plant operation professionals intending to make use of engineered polymers for bonding, coating, sealing, encapsulating, and the like, should look out for a number of factors when approaching a supplier. The research into the application's demands will pay off handsomely in a successful repair job, glitch-less process, or recall-free product. The foremost factor is correctly defining the industrial environment, i.e. what does the application entail? What data is required?

The following is a checklist including critical factors for your consideration when working with an applications engineer:

- What materials are involved in the bond?
- Which mechanical forces, shock, cycling, and vibration should be considered?
- How will the material be dispensed, and do you have equipment available, or will it be done by hand?
- How will the compound be cured (room temperature, high heat, UV, etc.)? Will an oven or other UV curing equipment be necessary?
- What is the cure time for the adhesive? This translates into downtime for you. While in maintenance its a matter of how much time the machine can

be laid up, in manufacturing operations, it's how much of a delay the production process can tolerate.

- Surface preparation: This depends on the product, but almost universally, surface preparation is one of the most critical aspects of a successful repair job.
- Mixing of the compound: Can you use a one-part polymer system or can you work with a two-part system?
- Accuracy of the mixing: Do you have scales and personnel to correctly measure and correctly mix without trapping air bubbles, etc.?
- Fixturing: How to clamp or use other devices to impose contact pressure between the parts is an integral part of the process.
- Do you know your bondline thickness? This is another critical issue, not only for curing but for strain considerations as well. Bondline thicknesses of 4 to 6 thousandths of an inch are always recommended.

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