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FOR THE MULTI-DISCIPLINED
DESIGN ENGINEER

NOVEMBER 2017 machinedesign.com

SMART AND SIMPLE

A flexible approach to motion
control abandons complex
mechanical systems **p75**

Holiday Gifts
for Engineers
p28

Thermoplastic Filaments



HEAT WELDING

Hot-air welding is another popular option for bonding thermoplastic resin together and functions along the same lines as an extruder. Think of it like Mig welding pieces of metal together, only instead of wire, you're using plastic. Most hot-air welding tools come with different sized adapters that allow you to swap-out based on the seam location. This makes for an easy weld, which is done by feeding the resin material and melting it as you draw it down the seam. This creates a bond that is stronger than any other method used.

It's also fast, cheap and ready to go as soon as it's cool to the touch. What's more, you can use it on any thermoplastic material (even multicolored resins) with no ill effects. Like

some of the others listed here, there are drawbacks of using this method, as it's not practical for working with thin parts. It also requires some skill to be effective, especially with curved and hard-to-reach seams.

Another option you may want to consider is ultrasonic spot welding, which uses localized sound waves to melt plastic. This actually works better than the heat method and produces a stronger bond than any of the other methods. Unfortunately, the cost of these machines can run in the thousands of dollars, making it out of reach for most home users.

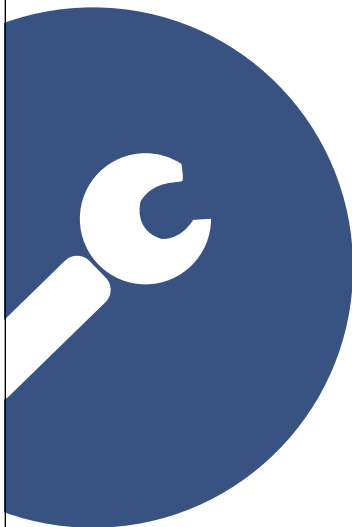
FRICITION WELDING

Friction welding is an ingenious solution to bonding plastic-based objects together and works similar to heat welding, only you're using friction instead of air.

In this case, you will need a rotary tool, something most makers and hobbyists have in their toolboxes. The process here is easy to



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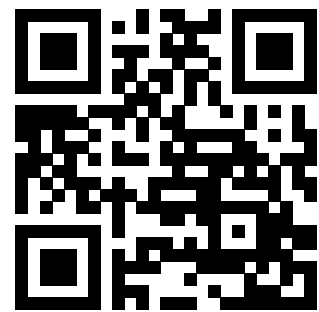
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