Tflex™ CR350
Dispensing Guideline

Application Note

Date: June 3, 2022

This application guideline provides general instructions for use for Tflex™ CR350.

Overview

Tflex™ CR350 is a two-part, silicone-based thermal gap filler that has low viscosity prior to curing. The low viscosity makes it ideal for applications in which the components cannot withstand high pressure during assembly. Tflex™ CR350 is ideal for applications where large gap tolerances are present. The mixed material will cure at room temperature or can be accelerated with the addition of heat. Tflex™ CR350 composition provides excellent thermal performance and compliance.

Shipping and Storage

Shelf Life: Shelf life for Tflex™ CR350 stored in unopened original package is 9 months from date of manufacture.

Storage Conditions: Tflex™ CR350 should be stored in original product packaging until ready for use. Recommended storage conditions are up to 35°C, with no special requirements on relative humidity when stored in original product packaging. For cartridges the direction to store the material is referred to the arrow from carton or sticker as in vertical tip-down dispense orientation. It's very important to keep the correct storage direction followed the note of the packaging.

Using recommendation after the original packaging opened:

1. Material should not sit idle in the mixing nozzle longer than the stated pot life of the material.
2. For cartridge packaging(50/200/400cc), please you purge 1~5g at the beginning to make sure the mixing ratio is 1:1, please use the remaining material within 72 hours after opening.

For pails packaging, please you make sure the metering dispensing valve is with the correct ratio 1:1 and purge 1~5g at the beginning, please use the remaining material within 7 days after opening.

Packaging: Tflex™ CR350 is a two-component product that is available in the below standard packaging sizes to support different application scenarios.

Table 1: Dual plastic cartridges, 1:1

PACKAGING SIZE	FILL
50cc (Dual plastic cartridge 1:1) (2*25cc)	47cc (150g)
400cc (Dual plastic cartridge 1:1) (2*200cc)	387cc (1240g)

Table 2: Plastic pails, size listed per pail

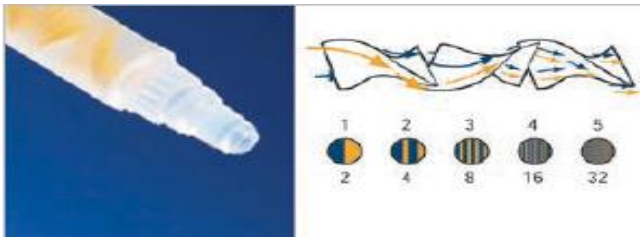
PACKAGING SIZE	FILL
1 gallon plastic pail*2	4062 cc *2 (26 kg)
5 gallons plastic pail *2	6250 cc*2 (40 kg)

50cc/200cc dual plastic cartridge

1gal / 5 gal Pails

Application and Clean-up

Mixing: Tflex™ CR350 is a two-part, silicone-based system and therefore requires mixing before use. Mixing should be done at a 1:1 ratio of part A (pink) to part B (white). Material should be used with matching part A and B batch numbers. Disposable plastic mixing nozzles can be used to mix parts A and B together. Mixing nozzles can be attached to the ends of cartridges or automated dispensing systems. Mixing nozzles with a minimum of 16 mixing elements are recommended to achieve proper mixing. Before attaching mixing nozzle, a small amount of material should be purged out of each cartridge to align pistons evenly and fill any air space in the tip of the cartridge.



Troubleshooting of using static mixers	
Problem	**Recommendation**
Striation (i.e. Two colors in the material indicating that is not mixed very well)	Increase the number of the elements to the upper limits for that type of material. **Or** Reduce diameter if increased back pressure is acceptable.
Set time is slow	Increase the number of the elements to the upper limits for that type of material. **Or** Reduce diameter if increased back pressure is acceptable.
Surface is tacky	Increase the number of the elements to the upper limits for that type of material. **Or** Reduce diameter if increased back pressure is acceptable.
Material not coming out fast enough	Increase the diameter of elements towards the upper limits for the viscosity of materials
Difficult to dispense material through mixer (When using a manual hand dispenser)	Increase the diameter of elements towards the upper limits for the viscosity of materials

Dispensing: Material can be dispensed with manual dispensing gun or automated dispensing systems for high volume in-line manufacturing.

- **Prototype & Low Volume Dispensing Method**

  The manual dispensing gun or pneumatic dispensing gun is recommended for the prototype and low volume dispensing.

50ml Manual Dispenser

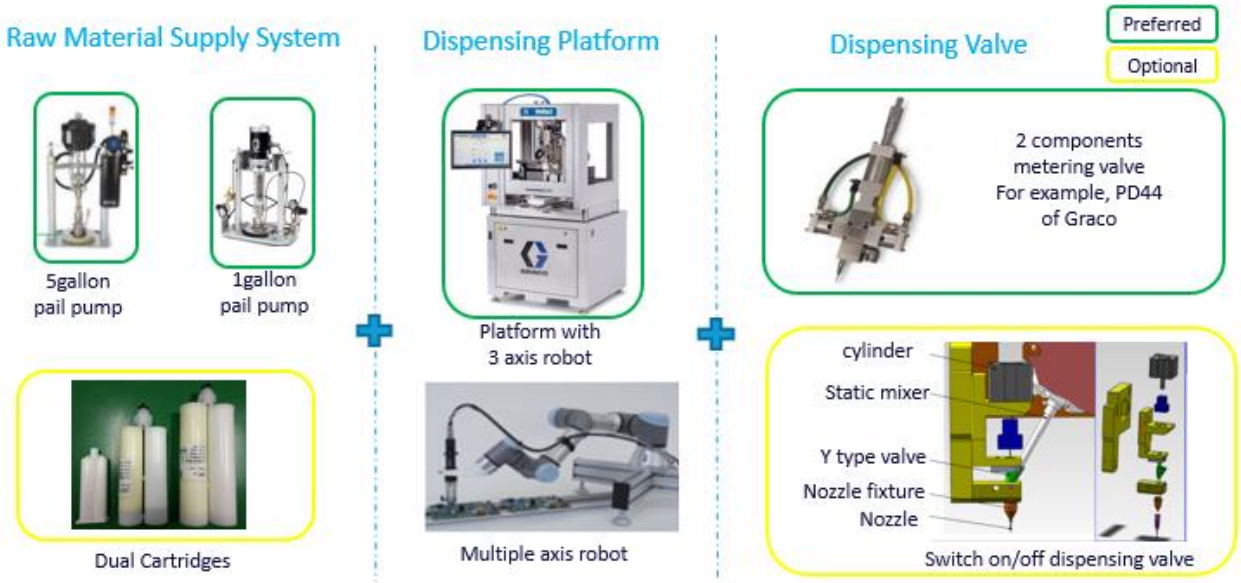
Manual Dispense Gun

Pneumatic Dispense Gun

Select the proper dispensing gun based on the size of the cartridge.

- **High Volume Dispensing Methods**

  Normally the dispensing system includes the raw material supply system, dispensing platform and the dispensing valves:

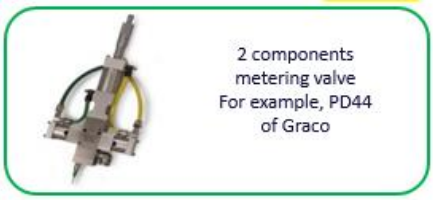


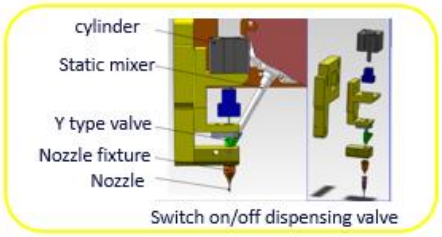
Raw Material Supply System:

- ✧ Generally, 2-component products are supplied from pails to the dispensing valve by a pump, which is better for efficiency and process stability.
  For the 5 gallon pails, the recommended pump pressure ratio is greater than 55:1 with the diameter of the air cylinder > 80mm. It is better for the material to be pumped at high pressure and this also helps to reduce the leftover material on the bottom of the pail.
  The dispensing pipe needs to be lined with TPFE and all connectors should be stainless steel.
- ✧ For plastic dual-cartridge products it is suggested to use a piston pushed by air cylinder or motor to dispense the material.

Dispensing Valves:

- ✧ The Graco PD44 metering valve is better for two component products dispensing precision and good cycle time, the dosing pressure is more than 100PSI.
- ✧ The metering valve can provide good dispensing precision, but normally the dispensing process is not continuous, a 2-metering valve system is recommended for continuous processing.
- ✧ Switch on/off valve dispensing precision is not very good.
- ✧ The static mixer selection and the diameter of dispensing nozzle is based on the dispensing precision and material; a smaller diameter needs higher dispensing pressure.

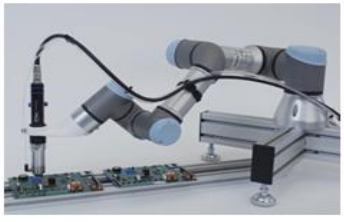




Dispensing Platform:

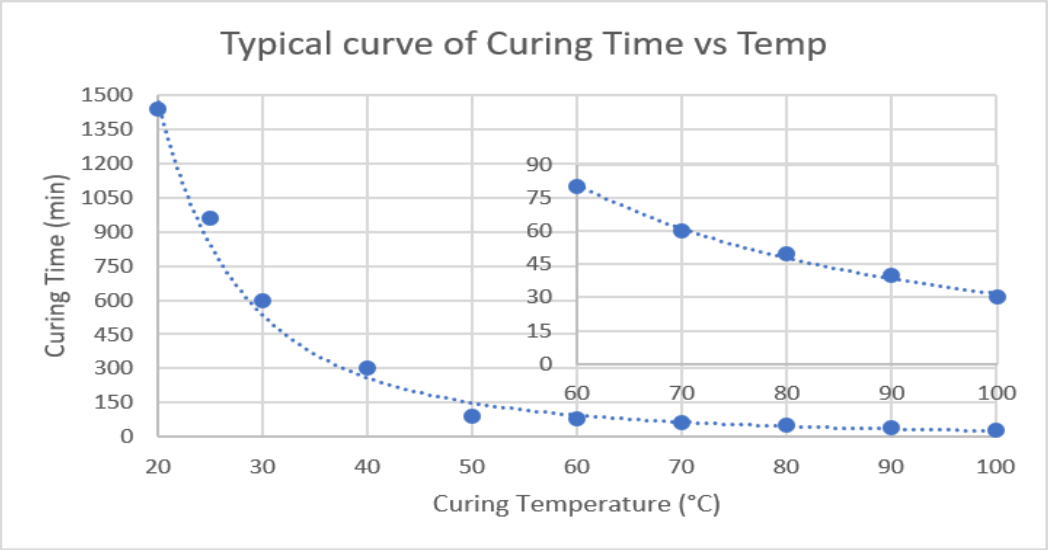
- ✧ Select the dispensing platform based on the dimension of the part and the dispensing pattern required.
- ✧ Need to estimate the dispensing platform combined with the dispensing valve, for example, the dispensing valve weight should not exceed the maximum capacity of the robot.

Platform with 3 axis robot



Multiple axis robot

Pot life and Cure time: At 25°C pot life (double viscosity) is greater than 60 minutes, and full cure is 24 h at room temperature. At 70°C cure time is 1 hour. Make sure surfaces to be covered are clean and dry.



The above cure profiles are guideline recommendations. Cure conditions (time and temperature) may vary based on customers' experience and their application requirements, as well as customer curing equipment, oven loading and actual oven temperatures.

Cure Inhibition: Tflex™ CR350 is a silicone-based material that requires proper curing to fully function. Various elements and their compounds have been proven to cause problems by inhibiting the curing of silicone systems which mainly include three types.
(1) Elements and their compounds of the VA and VIA families in the periodic table including sulfur, phosphorous, and nitrogen containing compounds, urethanes. compounds containing antimony, arsenic, tellurium, and selenium.
(2) Compounds with unsaturated bonds, such as alkynals.
(3) Some metal or metal ions, such as tin, lead, mercury.
During handling and use of the uncured materials, pay attention to the elements and their compounds mentioned above, some residual solvents or monomers, and some primers. Do not use latex gloves when handling uncured material.

Post Dispense Cure Check: Cure in place materials require proper mixing and curing in order to perform. It is also possible that these materials are subject to contamination which would inhibit curing. To verify there are no curing issues we recommend doing a post dispense cure check. Dispense a small amount of product onto a clean substrate and place in oven at 100°C for 60 minutes or allow to sit at 25°C for 24 hours. After the specified time, check to make sure the material cured and is no longer a liquid putty.

Exposure to solvents: Tflex™ CR350 is a silicone material filled with thermally conductive fillers. Exposure to organic solvents and strong bases can result in swelling or removal of the silicone carrier material resulting in degradation or loss of performance. For specific chemical resistance consult Chemical Resistance Tables for silicone materials such as the one listed at the following URL:
https://www.engineeringtoolbox.com/silicone-chemical-resistance-d_1879.html

Clean-up: Excess material can be cleaned up using a dry rag. Residual silicone oil can be removed using a clean rag and acetone solvent.

First Aid: Safe handling, disposal, and first aid measures are included in the SDS. Please read the SDS before using or handling this product. For further questions, please contact Laird.