Guide to Dispensing System Selection

In order to identify the most appropriate dispensing solution for an assembly process, certain basic information must be obtained for consideration. To help with this process, Tridak offers the following questionnaire as a guide.

With the information in hand, contact Tridak by phone or by email. Our applications engineers will work with you to arrive at the best dispensing system for your process.

Call us at 860-626-6700 or send an e-mail to sales@tridak.com

Basic Questions to Help Identify a Dispense Solution

1. What do you wish to dispense? (liquid, paste, gel, suspension, etc.)

2. What is the viscosity of your material? In engineering units (cP) or practical terms such as “like water”.

3. Does heat influence the viscosity? Will warming the material significantly increase its flowing tendency?

4. Is the material stable? Does it change in viscosity over its expected working life? Does the material contain a pigment or other suspended solids which might settle out if not agitated in a holding vessel? Will the material “skin over” due to loss of solvent?

5. Is the material tacky or stringy?

6. Does the material to be dispensed require heating to be properly delivered? What temperature range is required?

7. Does your material have any compatibility issues with other materials?

8. How many shots do you wish to apply at a time?

9. If dispensing multiple shots, what is the pattern of the shots? What are the shot dimensions?

10. What shot-to-shot reproducibility do you require? Stated in ± % of volume dispensed.

11. What volume (size of shot) do you wish to dispense? In engineering terms (ml, fl oz) or in practical terms (tiny drop, teaspoon).

12. How frequently do you wish to dispense in terms of cycles per second or per minute?

13. How will the part being handled be presented to the dispense station? (by hand, automatically)

14. What is the orientation of the part? Do you wish to dispense upon both sides of the substrate?

15. How is the treated part to be delivered after the dispense? (removed by hand, integrated into a linear, rotary indexing process, etc.)

16. How is the material packaged (syringe, bottle, pail), and what size is it packaged in?

Materials Handled

Listed below is a partial list of liquids and pastes which are regularly handled by the Tridak dispense systems.

Adhesives	Solder Paste	Grease	Acids
Anaerobics	Cyanoacrylates	Silicone	Gels
Alkalies	UV Adhesives	Acrylics	Paints
Lubricants	Medical Media	Lacquers	Fluxes
Solvents	Solder Mask	Urethanes	Epoxies

Viscosity Comparisons

One of the most important characteristics of a fluid or paste to consider when describing a dispensing application is the material's viscosity. Even if you have no formal numerical determination, a general description of the flow properties such as similar to water, maple syrup, Karo syrup, grease, etc. is extremely helpful in determining the appropriate equipment for an application. There is no substitution for an actual sample of the material. With all of these conditions in mind, the following table is offered to help give meaning to the values given in the literature for the material.

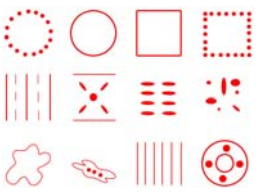
One of the properties of the fluid which is seldom mentioned in the literature but could be an "Achilles heel" to proper equipment recommendation is the potential stringiness of the product. Some high viscosity adhesives, particularly rubber solutions and some heavy silicone RTV's, have this peculiar problem. Be sure to note it in describing your material.

Viscosity Table

Typical Centipoise	Typical reference liquids at 20°C
1.0	Water
10	Kerosene
110	SAE 10 oil
200	Maple syrup
440	SAE 30 oil
1,100	Caster Oil
2,200	Honey
10,800	Molasses
18,000	Chocolate syrup
200,000	Peanut butter
1,500,000	Shortening

Multiple Dots, Perimeters & Patterns

Any combination of dots and lines, such as these shown in the illustration below can be dispensed using techniques such as multiple nozzle arrays, perimeter nozzles, programmable or dedicated X-Y-Z systems, dedicated or adjustable tracing systems, transfer dispensing or multiple valves. A verbal description or a sketch or sample part indicating the specific pattern or bead and its location will help us select the best and most economical dispensing method.

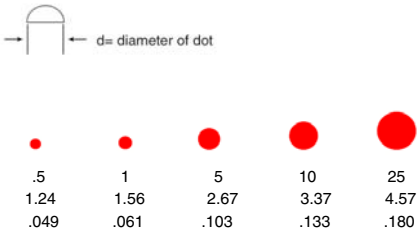


Volume Estimate

To assist in the visualization of the volume of material used in a dot, the examples below are based on the assumption that: the volume of a dot is approximately equal to 1/2 the volume of a sphere, and that the volume of a line is approximately equal to 1/2 the volume of a cylinder.

Notes:
1. All volumes in the illustrations are in microliters
2. 1 Microliter (µL) = .001 Milliliter (ml).

Dots:
Volume of a dot = S the volume of a sphere = V = $.2618d^3$



Volume (µL)	.1	.5	1	5	10	25
Diameter (mm)	.73	1.24	1.56	2.67	3.37	4.57
Diameter (in)	.029	.049	.061	.103	.133	.180

Conversion Factors

To Convert	Into	Multiply By
Liters	Milliliters	1000
Milliliters	Microliters	1000
Microliters	Nanoliters	1000
Nanoliters	Microliters	0.001
Microliters	Milliliters	0.001
Milliliters	Liters	0.001
Nanoliters	Cubic cm	0.000001
Millimeters	Inches	0.03937
Liters	Gallons	0.2642
Grams	Pounds	0.0022
Cubic cm	Cubic inches	0.06102
Cubic inches	Cubic cm	16.39
Quarts	Liters	0.94637
Gallons	Liters	3.785
Centimeters	Inches	0.3937
Inches	Centimeters	2.54
Pounds	Grams	453.5924
Inches of water	Lbs/ in sq.	0.03613
CM of mercury	Atmospheres	0.01316
Centigrade (°C)	Fahrenheit	(C x 9/5) + 32

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