How to Select the Best Two-Component Dispensing System

Nordson

EFD

Introduction

With rising standards for dispensing of two-component (2K) materials, manufacturers must turn to products that are affordable, readily available, precise, and easy to use. Nordson EFD's world-class 2K products lead the way in the dispensing of two-component epoxies, urethanes, and acrylics, as well as other adhesives and sealants.

Nordson EFD provides a wide variety of static mixers, cartridge systems, meter mix valves, and more to fit every need in the dispensing of two-component materials. All of our products are subject to our rigorous quality assurance inspection, and our USA-based manufacturing facility is ISO 9001:2015 certified.

Find Your Solution

Finding the best possible 2K dispensing system starts with one question:

Are you using a cartridge or meter mix valve to dispense two-component materials?

- Using a Cartridge? See page 3.
- Using a Meter Mix Valve? See page 9.

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Using a Cartridge

If you're using a cartridge, your system may include a dispense gun, cartridge, and mixer. Here are steps to help you select the best possible 2K cartridge system.

Step 1: Select Your Cartridge

Nordson EFD's high-quality cartridge systems dispense a wide variety of two-component materials. These cartridges range from Side x Side and coaxial to our innovative u-TAH® cartridge.

u-TAH Universal

u-TAH cartridges fit in professional caulking guns. They are the industry's most effective and highest quality two-component cartridge systems. The compact, universal package maintains accurate ratio control (1:1 and 2:1).

Side x Side

Our large selection of Side x Side cartridges are competitively priced and the highest-quality cartridges in the industry. Ratios range from 1:1 to 10:1 to ensure accurate on-ratio dispensing and to achieve proper mixing results.

380mL Coaxial

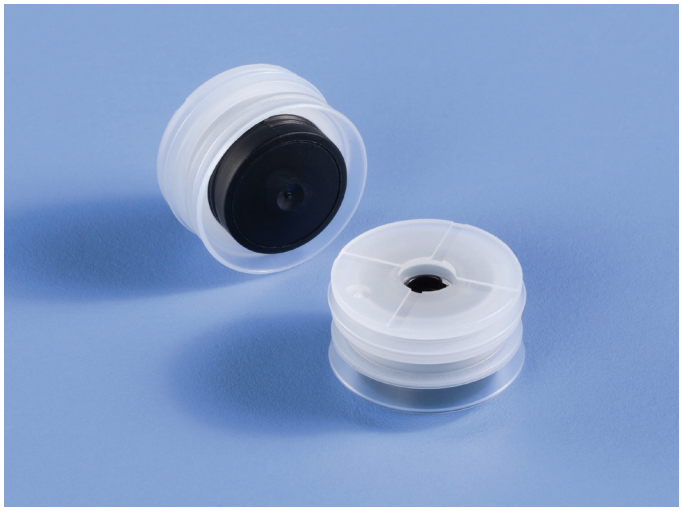
Our coaxial cartridge consists of a center tube and an outer "doughnut" that contains the two materials separately, dispensing at a 10:1 ratio. Our open and close valve eliminates the need for retaining nuts and plug closures when using this cartridge.

Note: These cartridges can be ordered with or without pistons pre-installed.

Cartridge Volumes, Ratios, and Types

Cartridge Volume & Type	Cartridge Ratio				Cartridge Type		
	1:1	2:1	4:1	10:1	u-TAH	Side x Side	Coax
Side x Side 50mL	✓	✓	✓	✓	–	Nylon or PP	–
Side x Side 160mL	✓	–	–	–	–	PP	–
u-TAH 180mL	–	✓	–	–	PP	–	–
Side x Side 200mL	✓	✓	–	–	–	Nylon or PP	–
u-TAH 250mL	✓	–	–	–	Nylon or PP	–	–
Side x Side 300mL	✓	–	–	–	–	Nylon or PP	–
Coax 380mL	–	–	–	✓	–	–	Nylon
Side x Side 400mL	✓	–	–	–	–	Nylon or PP	–
Side x Side 600mL	✓	–	–	–	–	PP	–
Side x Side 1500mL	✓	–	–	–	–	PP	–

Step 2: Select Your Piston



AF Air Free Pistons

Our patented AF™ pistons come complete with airtight and leak-proof seals that ensure safe shipment and a long shelf life. Upon insertion, the pistons quickly eliminate any air left between the material in the cartridge system and the piston.

Note: AF pistons are compatible with EFD Side x Side cartridge sizes 50mL, 200mL, and 300mL in 1:1 ratios. Our large side AF pistons are compatible with 50mL Side x Side cartridges in ratios 2:1, 4:1, and 10:1.

Other 2K Pistons

Nordson EFD's 2K pistons also come in Solid Multi-seal, Solid with O-ring, and Multi-seal Pistons with a Pre-staged Center Bleed Plug.

It's important to keep in mind that the viscosity of the materials being dispensed will affect the type of piston you use. For high-viscosity materials, for example, you would select an AF piston or solid piston. For low-viscosity materials, you would select a center bleed piston or solid bleed piston with O-ring.

SEE IT IN ACTION
www.nordsonefd.com/AFPiston_Video

Cartridge Volumes and Piston Types				
Cartridge Volume & Type	Piston Type			
	AF Air Free	Solid	Solid w/ O-Ring	Center Bleed
Side x Side 50mL	PE / PBT	–	PE / PP / Nylon	PP / Nylon
u-TAH 180mL	–	Pre-installed	–	–
Side x Side 200mL	PE / PBT	PP / Nylon	PP / Nylon	PP / Nylon*
u-TAH 250mL	–	Pre-installed	–	–
u-TAH 280mL	–	Pre-installed	–	–
Side x Side 300mL	PE / PBT	PP / Nylon	–	PP / Nylon*
Coax 380mL	–	Pre-installed**	–	–
Side x Side 400mL	–	PP / Nylon	–	PP / Nylon*
Side x Side 600mL	–	PP	–	PP*
Side x Side 1500mL	–	PE	–	–

Contact your Nordson EFD Application Specialist for recommendations.

*Can purchase with O-ring pre-installed.
**Can purchase without pistons pre-installed.

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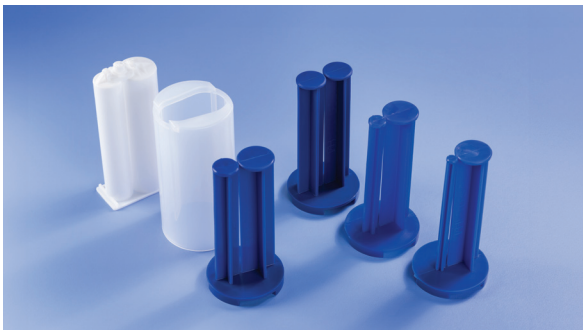
Step 3: Select Your 2K Dispenser

Nordson EFD's 2K dispensers are compatible for use with our 2K cartridge systems and help speed up the application of 2K adhesives.

50mL Manual Dispenser

When using a 50mL Side x Side cartridge, EFD offers an ergonomic manual dispenser for trouble-free, point-of-use dispensing.



50mL Caulking Gun Conversion Kit

EFD's versatile caulking gun conversion kit accepts most manufacturers' 50mL cartridge systems.

Manual Dispense Guns

The manual line of 2K dispense guns offer a portable and ergonomic option for dispensing two-component materials with a 26:1 thrust ratio.

Pneumatic Dispense Guns

Pneumatic guns use up to 120 psi (8 bar) of air pressure to dispense 2K materials with easy-to-use controls that help regulate speed. Spray gun also available.

Dispenser Volumes, Ratios, and Types

Cartridge Volume & Type	Cartridge Ratio				Dispenser Type		
	1:1	2:1	4:1	10:1	50mL Manual Dispenser	Manual Dispense Gun	Pneumatic Dispense Gun
Side x Side 50mL	✓	✓	✓	✓	✓	–	–
Side x Side 160mL	✓	–	–	–	–	✓	–
Side x Side 200mL	✓	✓	–	–	–	✓	–
Side x Side 300mL	✓	–	–	–	–	✓	–
Coax 380mL	–	–	–	✓	–	✓	–
Side x Side 400mL	✓	–	–	–	–	✓	✓
Side x Side 600mL	✓	–	–	–	–	✓	✓
Side x Side 1500mL	✓	–	–	–	–	✓	✓

Contact your Nordson EFD Application Specialist for gun recommendations.

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Step 4: Select the Appropriate Mixer for Your Cartridge

Now that you know what type of cartridge you need, you can begin to select the best mixer for your application. This table will help you determine which mixers best match your cartridge.

Select the Best Mixer for Your Cartridge

Cartridge Volume & Type	Cartridges			Mixers								
				OptiMixer	Turbo			Spiral				
	u-TAH	Side x Side	Coax	480	280	281N	295	160/160A	161N	190	260	HSS
Side x Side 50mL	–	✓	–	–	–	–	✓	–	–	✓	–	–
Side x Side 160mL	–	✓	–	–	–	–	✓	–	–	✓	–	✓
u-TAH 180mL	✓	–	–	✓	✓	✓	–	✓	✓	–	✓	–
Side x Side 200mL	–	✓	–	✓	✓	✓	–	✓	✓	–	✓	✓
u-TAH 250mL	✓	–	–	✓	✓	✓	–	✓	✓	–	✓	–
u-TAH 280mL	✓	–	–	✓	✓	✓	–	✓	✓	–	✓	–
Side x Side 300mL	–	✓	–	✓	✓	✓	–	✓	✓	–	✓	✓
Coax 380mL	–	–	✓	✓	✓	✓	–	✓	✓	–	✓	–
Side x Side 400mL	–	✓	–	✓	✓	✓	–	✓	✓	–	✓	✓
Side x Side 600mL	–	✓	–	✓	✓	✓	–	✓	✓	–	✓	✓
Side x Side 1500mL	–	✓	–	✓	✓	✓	–	✓	✓	–	✓	✓

Cartridge and Mixer Compatibility

Mixer Options

Series 480 | Series 280 | Series 281N | Series 295** | Series 160* | Series 161N | Series 190** | Series 260 | HSS Spray

Cartridge Type

u-TAH

Side x Side

Coax

Recommended Mixers

u-TAH	Side x Side	Coax
Series 480, 280, 281N, 160, 260	Series 480, 280, 281N, 295, 160, 190, HSS Spray	Series 480, 280, 281N, 160

Note: EFD provides an extensive offering of in-line pipe or tube mixers, which are used when bulk dispensing through meter mix equipment.

*Series 160 includes 160, 160A, 160AN, 161, 161A, and 161AN

**Series 190 and 295 can only be used with 50mL Side x Side cartridges

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Step 5: Select the Best Mixer for Your Material

Matching your specific material with the right mixer is critical. In general, if you're mixing two materials that are very similar, you can select a short mixer because they will be easy to mix. But if your two materials are very different, or if the ratio itself varies widely (for example, 1 part of material A to 4 parts of material B), then you need to select a longer mixer.

The material itself also matters. Acrylics and epoxies obviously have different material characteristics than silicones and urethanes.

Important: Choose the higher number of elements if one of two things occurs:

1. Material A and B are of very different viscosities.
2. Material A and B are very wide in mix ratio (i.e. 4:1 or greater). This is true for certain types of fluids only. Ask an EFD application specialist for recommendations.

Select the Best Mixer for Your Material

Fluid Material	# of Mixer Elements	Mixers									
		OptiMixer	Turbo			Spiral					
		480	280	281N	295	160	161N	162	190	260	HSS
Acrylic	8 - 10	–	✓	✓	✓	✓	✓	–	✓	✓	–
Epoxy	15 - 24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Polysulfide	24 - 32	✓	✓	–	–	✓	–	✓	✓	✓	✓
PU Foam	10 - 24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Silicone	20 - 30	✓	✓	–	✓	✓	✓	✓	✓	✓	✓
Urethane	24 - 36	✓	✓	–	–	✓	–	✓	✓	✓	✓

Step 6: Select the Best Mixer for Your Material Viscosity

Identifying the viscosity of the materials you are dispensing will help determine the diameter range of the mixing elements you will need. In general, if material A and B are both thin, low-viscosity fluids, you can use a mixer with a smaller diameter since they require less mixing. If the materials are thicker, you're going to need larger diameter mixing elements to get good results.

Select the Best Mixer for Your Material Viscosity

Material Viscosity	Mixing Element Diameter Range	Mixers									
		OptiMixer	Turbo			Spiral					
		480	280	281N	295	160	161N	162	190	260	HSS
Thin < 5,000 cps (Thinner than syrup)	0.093" – 0.25" (2.4 – 6.4mm)	–	–	–	✓	✓	–	–	✓	–	✓
Medium 5,000 – 50,000 cps (Thicker than honey, less than ketchup)	0.212" – 0.314" (5.4 – 8.0mm)	✓	–	–	–	✓	–	–	✓	–	✓
Thick > 50,000 cps (Thicker than ketchup)	> 0.366" (9.3mm)	–	✓	✓	–	✓	✓	✓	–	✓	✓

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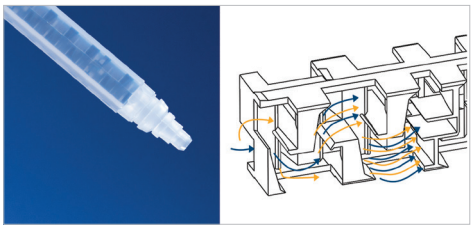
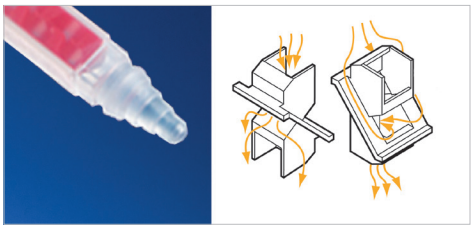
Step 7: Select an OptiMixer, Turbo, or Spiral Mixer

Nordson EFD offers a wide variety of static mixers, including square OptiMixers and Turbo mixers or round Spiral mixers. It's important to note, you should always use an OptiMixer or Turbo unless your application requires elements with a small diameter or long reach.



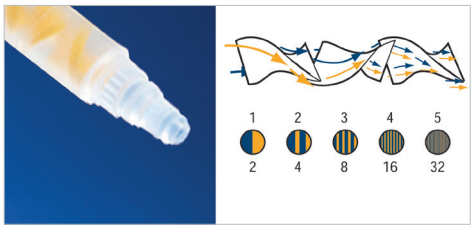
How OptiMixers Work

Using proprietary flow simulation technology, EFD improved the design of cross flow inverters and element wedges to develop OptiMixer™. This mixer optimizes mix performance in a significantly shorter length.



How Turbo Mixers Work

Our Square Turbo™ mixers' alternating left and right-hand elements provide more mixing in less distance, allowing the user to get closer to their work piece.



How Spiral Mixers Work

EFD Spiral™ mixers use our simple yet effective mixing process to provide thorough material mixing.

SEE IT IN ACTION
www.nordsonefd.com/OptiMixerVideo

Mixer Troubleshooting

If you have problems with proper mixing, here are recommendations that can increase the effectiveness of your mixing. Don't hesitate to contact your EFD Application Specialist for assistance at 800-556-3484, 401-431-7000, or info@nordsonefd.com.

Problem	Recommendation
Striation (i.e. two colors in the material indicating that it is not homogeneously mixed)	Increase the number of 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 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 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.

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Using a Meter Mix Valve

If you're using a meter mix valve, your system may include a valve, mixer, and accessories. Here are steps to help you select the best possible 2K meter mix system.

Step 1: Select the Best Spiral Mixer for Your Material

See page 7, Best Mixer for Your Material. Keep in mind, when using a meter mix system, you must use spiral mixers.

Step 2: Select the Best Spiral Mixer for Your Material Viscosity

See page 7, Best Mixer for Your Material Viscosity. Material viscosity will help determine the type of spiral mixer you need.

Step 3: Select Your Meter Mix Valve

Nordson EFD's meter mix valves are designed to bring the reactive adhesives and sealants into the static mixer and are engineered for easy disassembly and cleaning. Our pneumatic valves help increase productivity and eliminate the need for solvent flushing.

Series 400 and 400HF Autovalve

Series 450 Autovalve

Series 450XT Snuff Back Valve

Pneumatic Meter Mix Valve Series

Pneumatic meter mix valves provide ON-OFF functions, and metering in the proper ratio of A and B components is controlled by the metering pumps. Different manifolds are offered to assist this metering process. The selection of the manifold for each application depends on the flow rate, viscosity, and volume ratio.

Recommended Valves by Material or Viscosity			
Meter Mix Valves	Fluid Material		
Pneumatic	Adhesives & Sealants	Abrasive Urethanes	High Viscosity (162A Series Mixers)
Series 400	✓	–	–
Series 400HF	–	–	✓
Series 450	✓	–	–
Series 450XT	–	✓	–

Step 4: Select Your Valve Seal

(for pneumatic valves only)

If you're dispensing with a Series 400 or Series 450 pneumatic meter mix valve, you'll need to select the correct seal based on the type of material being dispensed.

EFD offers a wide variety of seal configurations. Select both the O-ring and U-cup seals based on chemical compatibility.

Recommended Valve Seal by Material Type	
O-Rings Model/Color	**Recommended for Contact With**
Viton (Brown)	Methylene Chloride, Alcohol, Carbon Tetrachloride
EP (Black)	MEK, Ketones, Acetone
PTFE (Orange)	All Adhesives and Sealants
U-Cups Model/Color	**Recommended for Contact With**
UHPME-Cup (Clear) & SS Spring	Epoxies Amine Catalyst, Polyesters, Acrylics
PU-Cup (Orange) & Viton O-Ring (Brown)	Epoxies General, Polyurethane, Polysulfides
PTFE Cup (Aqua) & PTFE O-Ring (Orange)	All Adhesives and Sealants

Step 5: Select Your Manifold

(for pneumatic valves only)

Nordson EFD's two-component manifolds connect your meter mix valve to provide a simple method of bringing the resin and hardener into the mixing nozzle.

Manifold Recommendations					
		Standard Flow 1:1	**Standard Flow Wide Ratio**	**High Flow 1:1**	**High Flow Wide Ratio**
Mixer Diameter	< 1/4"	400 / 450	400 / 450	–	–
	≥ 3/8"	450	450	400	400
Effective Ratio* of the Mixer	< 7:1	400 / 450	–	400	–
	≥ 7:1	–	400 / 450	–	400

Mixer Diameter = Standard vs. High Flow

Effective Ratio = 1:1 or Wide Ratio

*Effective Ratio is determined by multiplying the mix ratio with the component viscosity.

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Step 6: Select Your Handle

(for pneumatic valves only)

Nordson EFD offers electric or pneumatic handles for actuating the air cylinder of the valve. These handles feature an ergonomic design, which make handheld applications easier to execute.

Choose from three types of electric handles:

1. Pistol grip handle with pneumatic switch
2. Pistol grip handle with electric momentary switch (24 V)
3. Pistol grip handle with electric push on/off switch (24 V)

Keep in mind if you're using an electric handle, a solenoid from an outside vendor is required. We also offer a pistol grip handle with a pneumatic switch.

Step 7: Select a Metal Jacket for High Pressure Applications

Nordson EFD recommends the One Piece Metal Jacket attachment when pressure inside the mixer is greater than 150 psi (10 bar). We offer a wide variety of one-piece, affordable jackets that can be used over the mixing nozzle.

Additionally, we offer precision machined jackets for automated dispensing applications.

Request Information

Call or email us for a consultation with one of our Application Specialists to review your application requirements.

800.556.3484 info@nordsonefd.com

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