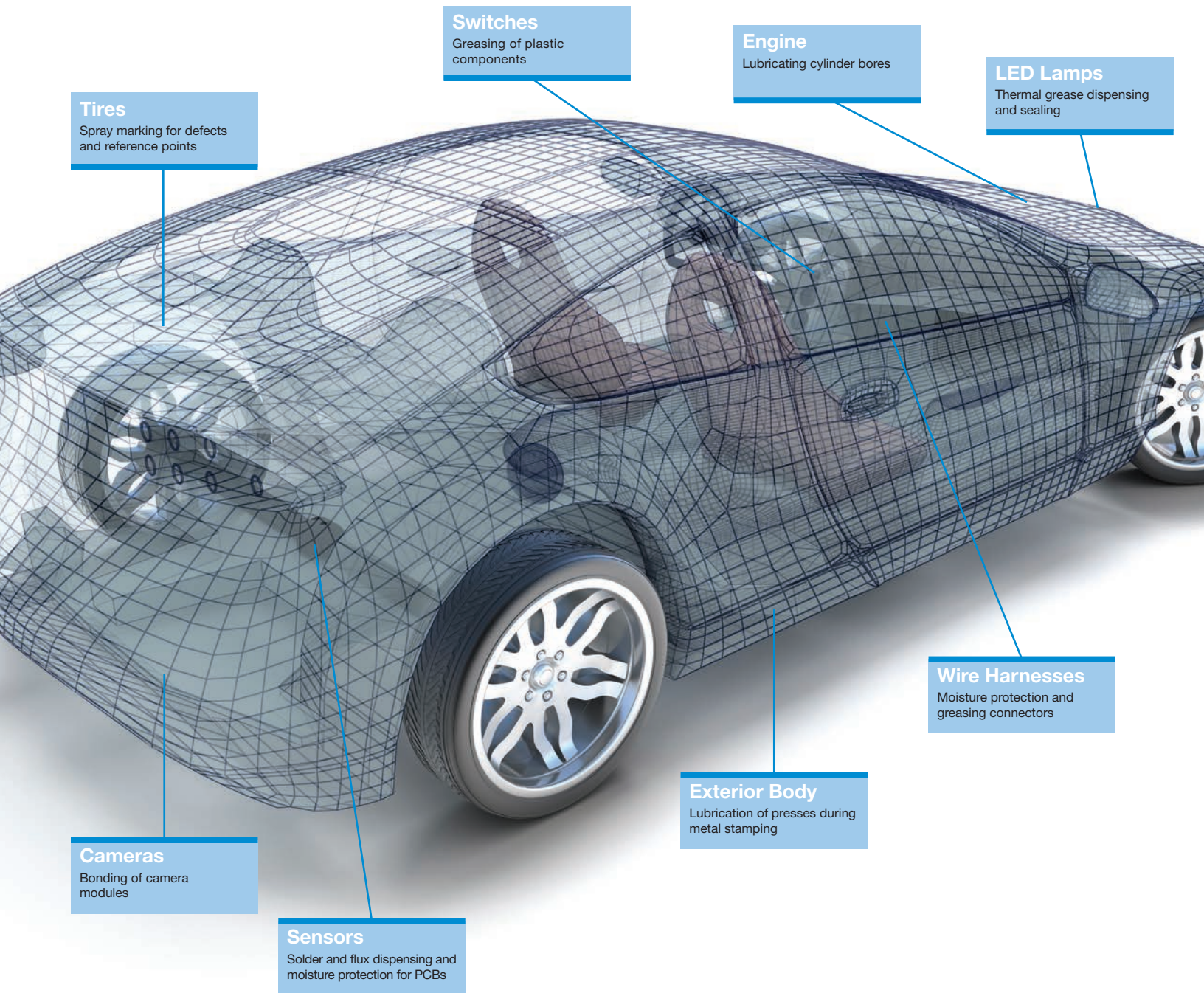


Nordson EFD Solutions:

Recommendations for High-Performance Dispensing in the Automotive Industry



Introduction

Automotive Fluid Applications

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Automotive manufacturers face a number of production challenges. Tighter regulatory requirements make it necessary to document every process. Manufacturers must now prove accuracy is the standard. And as consumers continue to demand higher quality, increased safety, and sophisticated infotainment systems at lower prices, many manufacturers must look for more efficient ways of doing things.

One major way to make a cost-savings impact while increasing accuracy and efficiency in production processes is by evaluating your dispensing applications.

This guide will help you determine:

- What dispensing equipment is available for different automotive applications
- How this equipment can help overcome production challenges

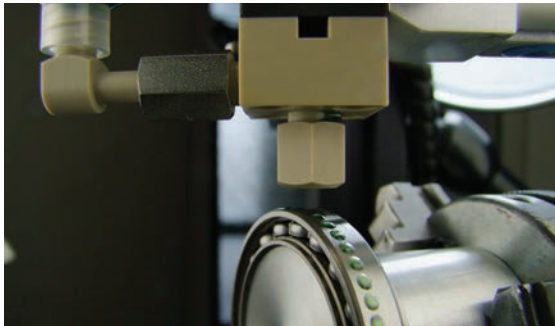
Please note that these are guidelines only. Every application is different. An experienced application specialist can help you select the best solution.

"In manufacturing, reliability is everything. That's what we get from EFD valves. If all our equipment worked as well ... our jobs would be easier."

– Ford Motor Company

Automotive Fluid Applications

Dispensing Anaerobics



P-Jet CT jets anaerobics with great precision.

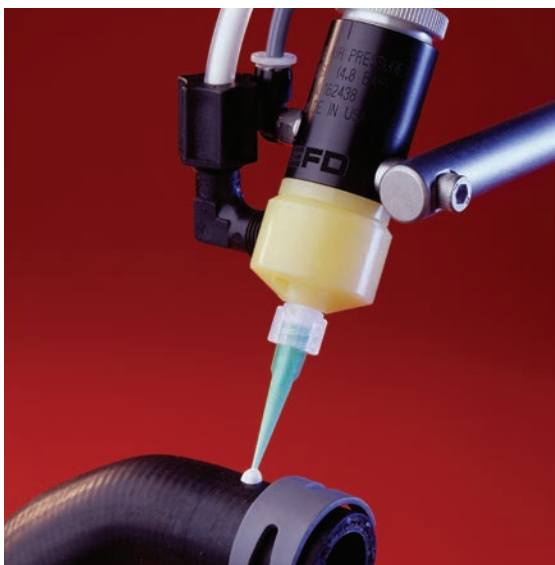
Bolts, screws, suspension struts, and fuel system filter assemblies

The Liquidyn® P-Jet CT and PICO® *Pulse*™ jet anaerobic adhesives from any direction without making contact with the substrate. By eliminating the need for Z axis movement, these solutions provide the significantly faster production speeds needed for high-volume applications.

Benefits include:

- Dispensing onto hard-to-access or uneven surfaces
- Precise, repeatable deposits starting at 0.5 nL
- Cycle rates up to 1500Hz (cycles per second)
- Longer operating time between maintenance
- Available with PEEK (polyetheretherketone) wetted parts

P-Jet CT and PICO Pulse are among the few non-contact dispense valves in the marketplace that can dispense reactive fluids like anaerobics.



EFD 752V diaphragm valve applying fluid to a hose clamp.

For contact dispensing, the 752V-SS diaphragm valve is the most reliable solution. Its cycle rate exceeds 500 per minute. For micro-deposit dispensing, the xQR41 Series MicroDot™ needle valve with PEEK (Polyetheretherketone) wetted parts delivers consistent shot sizes as small as 0.18 mm in diameter.

For benchtop use, you'll want to use an operator-controlled fluid dispenser such as the Ultimus™ and UltimusPlus™ Series. These air-powered dispensers eliminate guesswork by using air pressure and microprocessor-based timers to produce accurate, consistent shots.

The network-capable UltimusPlus dispenser allows dispensing control from a PLC or other manufacturing plant controller for added process efficiency.

For internal engine bores or cap plugs, the 7860C Radial Spinner System is used to apply a coating to the internal walls.



Ultimus fluid dispensers provide precise fluid dispensing control for advanced applications.

Automotive Fluid Applications

Dispensing Cyanoacrylates



P-Jet CT jets CAs with long run times between maintenance.

Hoses, shock absorbers, sensor magnets, sunroofs, and mirror assemblies

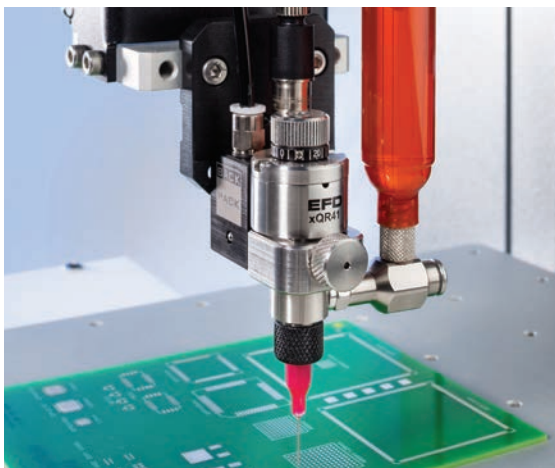
The Liquidyn P-Jet CT is one of the only non-contact dispense valves that can accurately jet cyanoacrylate adhesives at high speeds with high repeatability and low maintenance. Its design allows it to operate with low voltage of 24 V and air pressure of 2-5 bar (29-72 psi), making it highly adaptable to any automated processes.

P-Jet CT is also easy to control via an existing PLC. When paired with a Laser Light Barrier it keeps a record of each deposit dispensed for a documented process.

Machined from inert UHMW (Ultra High Molecular Weight) polyethylene, the 752V-UHSS valve is the ideal contact dispense valve for cyanoacrylate applications. When paired with the ValveMate™ 8000 controller to control deposit size, it works well in an automated process.

For benchtop processes, we recommend air-powered dispensers such as the Ultimus and UltimusPlus Series. Dispensers paired with Nordson EFD syringe barrels and pistons deliver consistent deposits. Optimum® SmoothFlow™ tapered and PTFE-lined dispense tips work best when dispensing cyanoacrylates.

Dispensing UV-Cure Adhesives



xQR41 sealing PCB.

Potting and sealing electronic components

For applications requiring microdots, the xQR41 needle valve maintains UV-cure adhesive deposit size as small as 150 µm in diameter and features an adjustable needle stroke, which allows the user to maintain exact deposit size.

For filling, potting, or sealing electrical components, the xQR41 and 741V needle valves are best. The 797PCP and 797PCP-2K progressive cavity pumps provide continuous volumetric dispensing for exceptional repeatability. The pumps are ideal for potting and sealing applications. Use the 797PCP-2K pump for 2-part fluids.

OptiSure™ automated optical inspection software and confocal laser can be used with our vision-guided robots to provide optical assurance of fluid deposit dimensions and placement for better quality control.

Sensor and battery cell assemblies

Liquidyn P-Jet CT jet valves can handle some of the trickiest fluids in automotive assembly processes, including UV-cure cyanoacrylates. Both P-Jet and PICO *Pulse* valves can also dispense UV-cure anaerobics. No other non-contact valve can handle this type of application used in the assembly of automotive sensors and battery cells.

Automotive Fluid Applications

Dispensing Epoxies



797PCP-2K progressive cavity pumps provide best-in-class deposit volume accuracy and repeatability.

Bonding rearview and side-view mirrors, sensor housing, and panels

For one-component heat-cure epoxies, EFD recommends the 725DA-SS piston valve. The 725DA provides stroke adjustment and end-of-cycle snuff back while dispensing a wide range of medium-viscosity to thick fluids.

For 2-part epoxies, Nordson EFD 797PCP-2K progressive cavity pumps are ideal for continuous volumetric meter mix dispensing when paired with our Series 190 disposable spiral and Series 295 disposable square bayonet mixers. Specify our 7197PCP-DIN-NX controller to control all dispensing parameters directly from a PLC or other plant controller.

Dispensing Sealants



736 high-pressure valve can deposit at up to 172 bar (2500 psi).

Hydraulic pumps, motor housings, fuel pumps, transmission housings, and end caps of drive shafts

For applications requiring fluid pressure up to 7 bar (100 psi), EFD recommends the 725DA-SS piston valve. It provides consistent control and stroke adjustment for both fluid flow and snuff back.

For higher pressure applications of up to 172 bar (2,500 psi), we recommend the 736HPA valve. It keeps dots and lines consistent and prevents drooling between shots. Deposit size for both valves is easily controlled with a ValveMate 8000 controller.

Bonding chrome trim, emblems onto wheel covers, and glass onto mirror housing

For benchtop applications, the Ultimus and UltimusPlus Series air-powered dispensers are recommended. Along with Optimum components, these dispensers eliminate variability in benchtop fluid dispensing processes. Tapered dispensing tips provide the best flow rate for medium- to high-viscosity fluids.

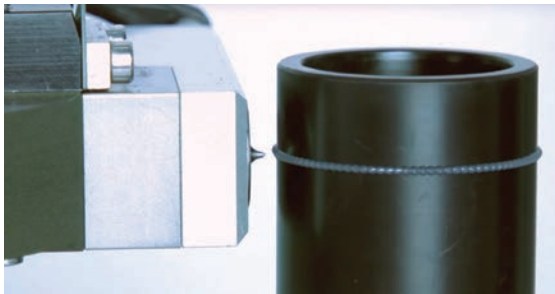


Ultimus dispensers feature time adjustment ≥ 0.0001 seconds for exceptional control.



Automotive Fluid Applications

Dispensing Grease



Liquidyn P-Jet CT dispensing grease onto cylinder.



The 736 valve dispensing grease onto automotive fuel pump bonnet.

Gearboxes, safety switches, speedometer gears, sunroof rails, O-rings, locks, and drill holes

The PICO *Pulse* and Liquidyn P-Jet CT and P-Dot CT non-contact dispensing systems jet controlled amounts of greases, lubricants, and oils in various automotive applications. An experienced application specialist can help determine which one best fits your application. However, the benefits of jetting over traditional contact dispensing in these applications include increased precision and repeatability at faster speeds of up to 1500Hz continuous, depending on the valve.

Jetting eliminates Z-axis movement, therefore speeding production. Zero contact with the substrate makes it easy to dispense in hard-to-reach areas from any angle, even upside down.

Door handles, seat recliners, control knobs, clutch assemblies, and brake assemblies

For contact dispensing of thick greases, EFD recommends the 736HPA-NV high pressure valve. With a stainless steel spool, it dispenses at pressures up to 172 bar (2500 psi) and dispense rates exceeding 400 cycles per minute. Adjustable stroke control that regulates the opening surge and closing snuff-back prevents drooling.

General lubrication

When you need to spray grease, EFD offers two options: the 781 Series spray valves for external spraying, and the 782RA Series for internal spraying. Both provide extremely consistent coverage, and thanks to Low Volume Low Pressure (LVLP) technology, dispense with no overspray or mist. A programmable nozzle air delay after each spray cycle keeps the spray nozzle clog-free and reduces maintenance and downtime.

Dispensing Thermal Grease



The 794-TC valve is designed to make precise, repeatable deposits and patterns of thermal interface materials.

Flat pack actuators, gears, switches, and connectors

Nordson EFD's PICO *Pulse* jetting systems jet thermal grease on a variety of motorized parts and electrical connectors. PICO valves use piezoelectric technology to jet at continuous speeds up to 1500Hz, with exceptional process control.

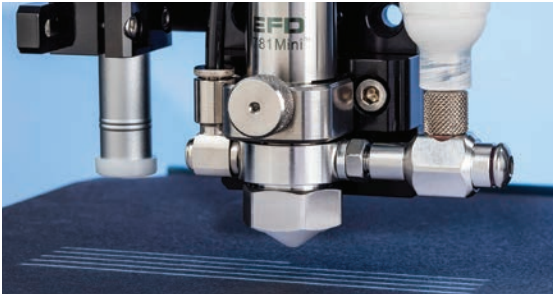
The 794-TC Series utilizes a robust tungsten carbide (TC) auger screw and fluid body liner that resists wear from highly abrasive pastes to guarantee long valve life.

The 797PCP progressive cavity pump works well with highly abrasive pastes. Continuous volumetric dispensing provides a reliable and repeatable process.



Automotive Fluid Applications

Spraying Adhesives and Primers



Spray marking parts with a 781Mini valve.

Window weather sealing frames and trim lines to secure two-sided tape

For extremely thin lines, the 781Mini™ Series valve is the best choice. It produces spray patterns from 1 mm (0.04") to 25.4 mm (1.0") in diameter. For slightly wider patterns, EFD recommends the 781S Series spray valve.

These valves provide extremely consistent coverage, tightly controlled spray patterns with minimal overspray, high transfer efficiency, and cycle rates that exceed 400 cycles per minute. For easier, on-the-fly adjustments, pair it with a ValveMate controller, which allows you to set both time and pressure near the point of dispense.

Spraying Lubricants

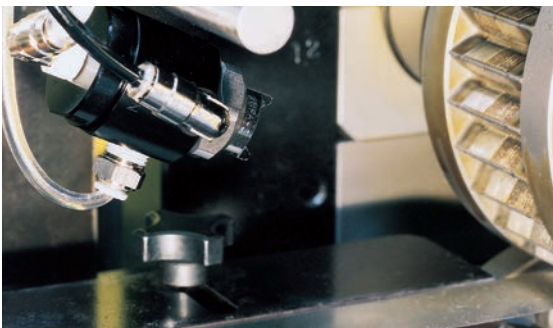


For even, consistent internal diameter spraying applications, the 782RA is the best choice.

Cylinder bores

The best choice for this application is a radial spray system. EFD's 782RA radial spray valve uses Low Volume Low Pressure (LVLP) technology to apply uniform coatings. It's perfect for spraying low- to medium-viscosity materials inside of parts that are 25.4 mm (1") to 304.8 mm (12") in diameter.

Spraying Oil



Reduce material costs by 60% or more with MicroCoat.

Metal stamping applications for the hood, doors, panels, and brackets; bending; forming; fin mill machines to manufacture radiators and heater cores

When spraying oil or another lubricant, the MicroCoat® Lubrication System is the best choice. Using Low Volume Low Pressure (LVLP), this non-contact system applies oil as a fine, consistent film that provides complete coverage using much less material with no overspray or mist.

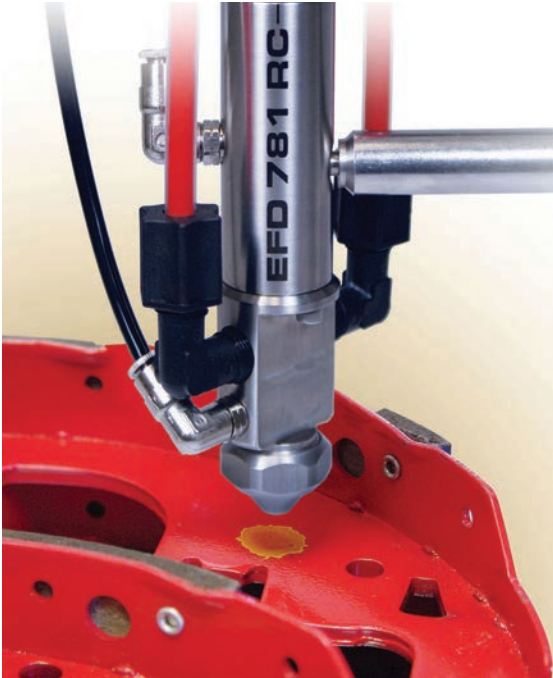
Operating up to eight valves, the system provides even top and bottom coverage in either steady or pulsed lubrication applications.

"We stamped over 900,000 parts using only 1 gallon of oil. When we checked the tool under a microscope, there was no visible wear."

– Zierick Manufacturing Corporation



Spraying Ink and Paint



781RC Recirculating spray valve keeps pigments in suspension.

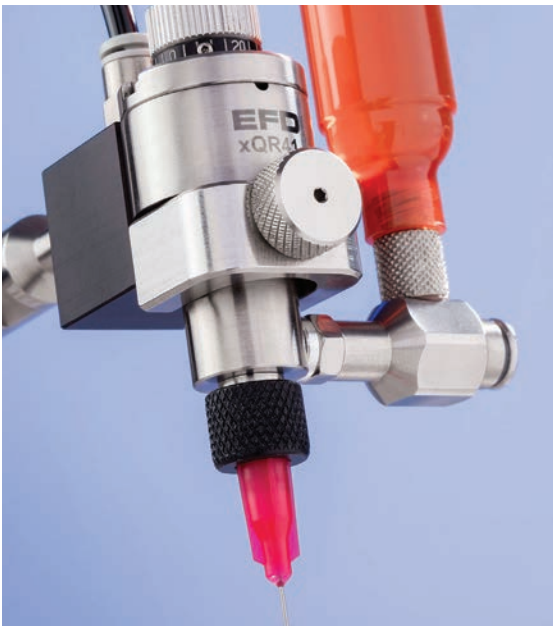
Marking defects and reference points, and differentiating similar parts

The 781RC-SS MicroMark™ system is the perfect tool for spray marking. Dispense micro liter to milliliter amounts reliably and consistently with no clogging, dripping, or drying out. Coupled with the ValveMate 8040 controller, this valve provides repeatable dispensing and placement with no mist or overspray.

For inks and paints that require pigments that must remain in suspension, EFD recommends the Recirculating Spray Marking System. It produces uniform round patterns and stripes without overspray.

It is the only system of its kind that uses a unique recirculating pump to eliminate clogging, maintenance, and downtime often associated with standard marking systems.

Dispensing Paint and Primers



xQR41 is 60% smaller than comparable needle valves.

Trim sections, around plastic grill, and into recessed areas of molded parts to add color

The xQR41 valve is perfect for microdots and lines/stripes in very tight areas. For a benchtop solution, the Performus™ Series offers a range of dispensers with features such as timed or steady operation, digital vacuum display, and a Teach function. For manual assembly, EFD's line of handheld dispense valves are ideal for stripes and beads in applications where a timed shot is not required.

Automotive Fluid Applications

Dispensing Solder Pastes, Braze Pastes, and Flux



Performus X provides excellent process control in solder applications.

Electronics, air conditioning, ignition systems, fuel systems, and affixing brackets

The Liquidyn® P-Jet SolderPlus® is a high performance jet valve system designed for the non-contact micro-dispensing of Nordson EFD SolderPlus® solder paste and filled products. The Liquidyn P-Jet SolderPlus valve can produce micro-deposits as small as 700 µm at dispensing frequencies of up to 25Hz, for a faster production process. The valve can also dispense larger fluid volumes and is capable of both dot and line dispensing.

With two motor types available for lines/stripes and microdots, the 794 auger valve system is a complete solution for solder paste dispensing. When dispensing copper braze paste and flux paste, we recommend the 725DA-SS piston valve with stroke adjustment. The 741V-SS needle valve features zero dead fluid volume and positive shutoff, and works well for very small dots of flux.

For operator-controlled processes, the Performus Series dispenser line is ideal. Featuring a Teach function that makes it easy to set the initial shot size, it brings exceptional process control to critical dispensing processes.

The Atlas™ barrel loader system is recommended for ease of loading braze paste.

Custom Solder Paste and Thermal Interface Materials



Choose from a wide variety of specialized formulations.

Learn more about EFD dispense paste, print paste, flux, thermal compounds, and solder mask, including specialized formulations. We are a dispense flux technology leader and one-stop shop for solder, dispensers, valves, and automation.

Contact solder@nordsonefd.com for more information.



Fluid Applications Listed by Part

As a trusted partner of thousands of automotive part manufacturers around the world, and with offices in more than 40 countries, Nordson EFD's global team can provide experienced, on-site technical support and recommendations for your most demanding dispensing challenges.

Below is just a small list of the many applications in which we provide superior dispensing solutions.

Battery Cell Manufacturing

Battery Assembly

- Apply thermally conductive adhesives
- Dispense thermal interface materials
- Apply structural adhesives
- Dispense electrolyte for final fill process

Chassis System Components

Axles

- Apply adhesives on bolts

Brakes

- Lubricate bores before inserting plungers
- Spray ink on aluminum tubing for pass/fail
- Apply CAs to bond rubber hose protectors to hoses
- Lubricate brake, accelerator, or hood latch cables
- Apply copper braze paste to steel fittings
- Apply UV-cure adhesive to seal connectors

Drive Trains

- Apply RTV for vibration control in drive system

Frame & Suspension

- Apply CA to shock absorber components
- Apply anaerobics on suspension struts
- Apply RTV to bond trim on trailer hitches

Steering

- Apply braze paste to auto power steering lines
- Apply grease to bearings
- Apply adhesives to rubber components

Wheels & Wheel Covers

- Spray ink on tires for quality control

Exterior Systems and Components

Body Hardware

- Apply grease and CAs in sunroof assembly

Body Panels

- Apply grease or oil to door handles
- Apply grease in trunk latch assemblies

Bumpers

- Spray marking ink to indicate pass/fail

Grills

- Apply RTV to bond reflective emblem to grill
- Apply resist paint around the edge of grill

Decorative Trim

- Fill grooves on chrome trim with paint

Windshields, Window Panes, & Window Seals

- Apply CAs to door and window sealing
- Spray primers on rubber profile of window seal
- Spray adhesives on triangular windows

Interior Systems and Components

Headliners & Floor Coverings

- Bond foam support blocks to headliner panels

Passenger Restraints

- Apply adhesive to bond plastic body side molding
- Apply grease on glove box cylinder shock absorber

Seating

- Spray grease on metal frames of seat adjustment
- Apply threadlockers to pilot nuts and screws
- Apply grease to hinge points and gear teeth

HVAC Systems

Air Conditioning Systems

- Spray silicone oil into small holes of AC block
- Apply braze paste to seal lines on AC components
- Apply braze paste and flux to aluminum tubing
- Apply CAs to make gaskets for climate control systems
- Apply grease on gears and rails
- Apply corrosive flux to AC parts
- Apply grease to shafts of actuators for AC ducts

Radiators & Heat Exchangers

- Lubricate oil in fin mill machine for heater cores

Power Train Systems and Components

Air Induction

- Apply epoxy around a capacitor

Engine & Engine Components

- Apply RTV into a cavity on horsepower motors
- Apply grease to starters and alternators
- Apply solder paste to starters and alternators
- Apply grease and sealants to motor housing
- Spray lubricant inside manifolds
- Apply wax lubricants to engine crankshaft seals
- Spray paint/ink for identification of engine parts
- Apply anaerobics to studs for cover plate
- Apply cyanoacrylate on engine hose assembly

Hydraulic Pumps

- Apply sealant to seams of hydraulic pump

Fluid Applications Listed by Part

Fuel Systems

- Apply sealants to fuel injection and fuel pumps
- Lubricate fuel injection and fuel pumps
- Apply braze paste to fuel injector assembly
- Apply braze paste to fuel pumps and fuel lines
- Apply braze paste to brake/power steering lines
- Apply sealants to vent used for thin fuel cap
- Apply adhesive sealant on fuel system stand pipe
- Apply paint to bolt of throttle body assemblies
- Apply CA to bond rubber hose protectors to hoses
- Apply anaerobics to bond filter assemblies

Transmissions

- Apply gasket on automatic transmission housing
- Apply sealant over holes in transmission housing
- Apply cyanoacrylate to camshaft
- Apply grease to clutch actuator components
- Fill fan drive shaft bearings with grease
- Spray paint to mark drive shaft

Electrical, Electronic Systems, and Components

Electronics (General)

- Apply solder to connectors
- Apply UV/moisture-cure adhesive to trailer/bus connector
- Potting electronic components with UV-cure silicone
- Apply epoxy for potting connectors
- Apply flux and solder mask to printed circuit boards
- Apply thermal grease to thermostat integrated circuit board
- Solder resistors on automated transmission pressure transducers
- Coat pin leads with epoxy

Control Switches

- Apply grease onto switches
- Apply epoxy to seal electronic control modules

Driver Information & Instrument Clusters

- Apply electrical grease on instrument cluster contacts

Electric Motors

- Apply grease to end cap of wiper motor
- Potting wiper motors with UV-cure silicone

Ignition & Starter Systems

- Solder components in automatic electronic ignition modules
- Apply epoxy, RTV, and solder paste to voltage regulators
- Apply epoxy, RTV, and solder paste to capacitors
- Apply epoxy, RTV, and solder paste to ignition systems
- Apply epoxy, RTV, and solder paste to circuit boards
- Apply sealant and flux on ignition module sensors
- Apply silicone grease to ignition cable boots

Lighting & Headlamps

- Apply gasket material to light assemblies
- Bond rubber gasket to head lamp assembly
- Apply solder braze paste to head lamp assembly

Sensors, Relays, & Regulators

- Apply adhesive to wire on an anti-lock brake sensor
- Apply epoxy and conformal coating of sensors
- Apply Hysol onto a cam sensor
- Apply UV-cure adhesive on fuel sensor magnet wires
- Apply epoxy to encapsulate electronics
- Apply epoxy for potting sensors, e.g. fuel pedals
- Apply plastic adhesive dots to vacuum sensors

Wiring & Harness Connectors

- Apply grease on wire harnesses
- Apply RTV to seal harness terminals

Multipurpose Systems and Components

Fasteners

- Apply sealants to nuts, bolts, and rivets
- Apply threadlockers to nuts, bolts, and rivets
- Apply anti-seize coatings to nuts, bolts, and rivets
- Apply anti-slag coatings to nuts, bolts, and rivets

Filters

- Apply bead of sealant on oil filter
- Spray parts for roll forming filter

Gaskets & Seals

- Apply adhesive to adhere gasket to plastic part
- Apply dots of CA to bond rubber to hood seal

Hoses & Belts

- Apply CA to bond rubber hose protectors to hoses

Cables

- Apply grease to a rubber grommet
- Lubricate brake, accelerator, or hood latch cables

Mirrors

- Spray grease to hinge points of mirror assembly
- Apply epoxy around perimeter of mirror glass
- Apply UV-cure adhesive to plug gaps in mirror
- Apply RTV to hold glass in plastic housing
- Apply cyanoacrylates in mirror assembly

Solenoids

- Apply epoxy, solder paste, and sealants to solenoids

Dedicated to providing the highest quality products and customer support since 1963, Nordson EFD infuses a depth of application knowledge into every precision dispensing product we develop.

For automotive manufacturers, EFD's innovative dispensing technology can improve your manufacturing processes, fostering greater control and cost effectiveness, while increasing overall part quality and throughput.

Material Savings

Many of the high-performance materials needed to bond dissimilar materials and seal exposed parts are expensive, making waste reduction an important issue. Due to the large number of automotive parts produced, even small cost-reductions per part can provide significant savings.

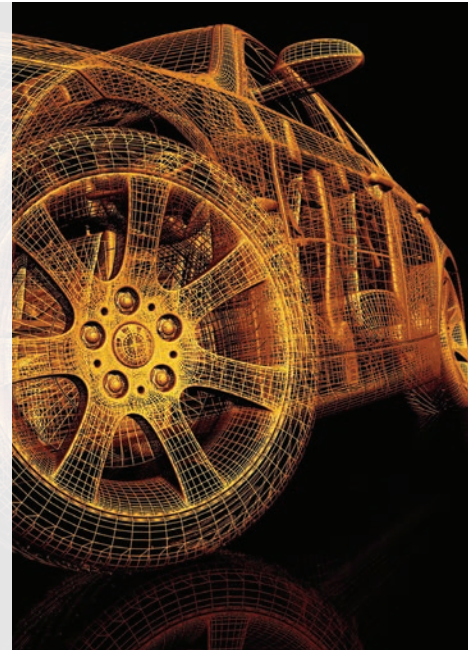
- Reduce material waste by 50 percent or more
- Emptying material reservoirs as completely as possible minimizes waste during changeovers
- Closed-system design reduces waste by minimizing premature curing of materials
- Significantly fewer part rejects, saving material that would have been used to build reject parts

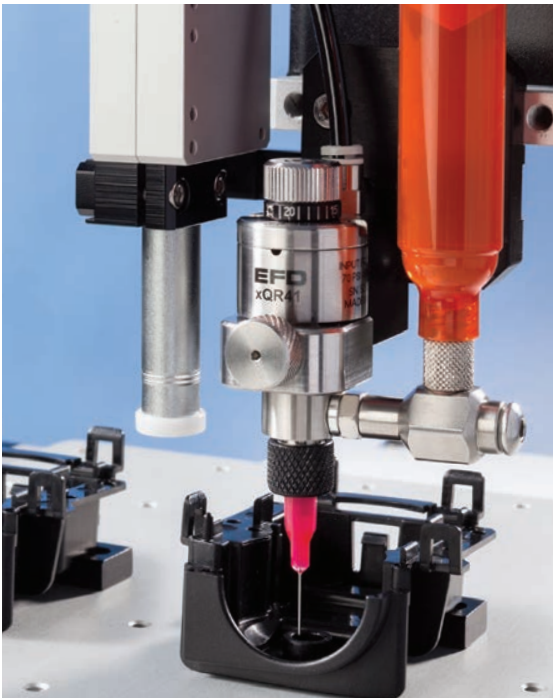
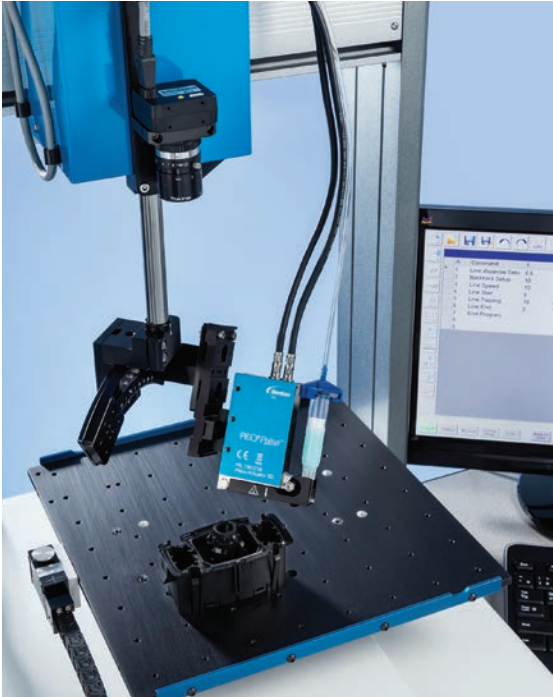
Higher Quality

Manufactured using high-quality materials in silicone-free facilities, Nordson EFD fluid dispensing systems are designed to deliver the most consistent, precise fluid deposits. This reduces labor time associated with rejects and reworks, cutting overall operating costs while increasing product quality.

Productivity Gains

Due to faster, more consistent material dispensing, operators and assembly machines typically produce more parts per hour. In addition, more precise application with EFD systems leads to less time and costs associated with clean up, further improving productivity.





Expert Recommendations

Most Nordson EFD fluid application specialists have at least 10 years of experience helping customers find the right dispensing solutions for their fluid and application requirements.

Just call 800-556-3484 or email info@nordsonefd.com to get an expert recommendation today.

Find CAD Models

Easily locate all of the 3D and 2D CAD models of EFD valves, controllers, dispense tips, tanks, components, fittings, and more.

[3D Content Central](#)

Application Videos

Visit our video gallery to access 100+ application, how-to, and promotional videos. See how EFD dispense and jetting valves actually work in real-life dispensing footage.

[Video Gallery](#)

Valve Selection Guide

Quickly find valves by application and fluid type to get an idea of the breadth of dispensing solutions provided by Nordson EFD.

[Valves by Application](#)

Application Testing

Request an application test with your fluid and parts to validate our dispensing systems for your customers. Fill out this simple form to get started.

[Request Application Test](#)

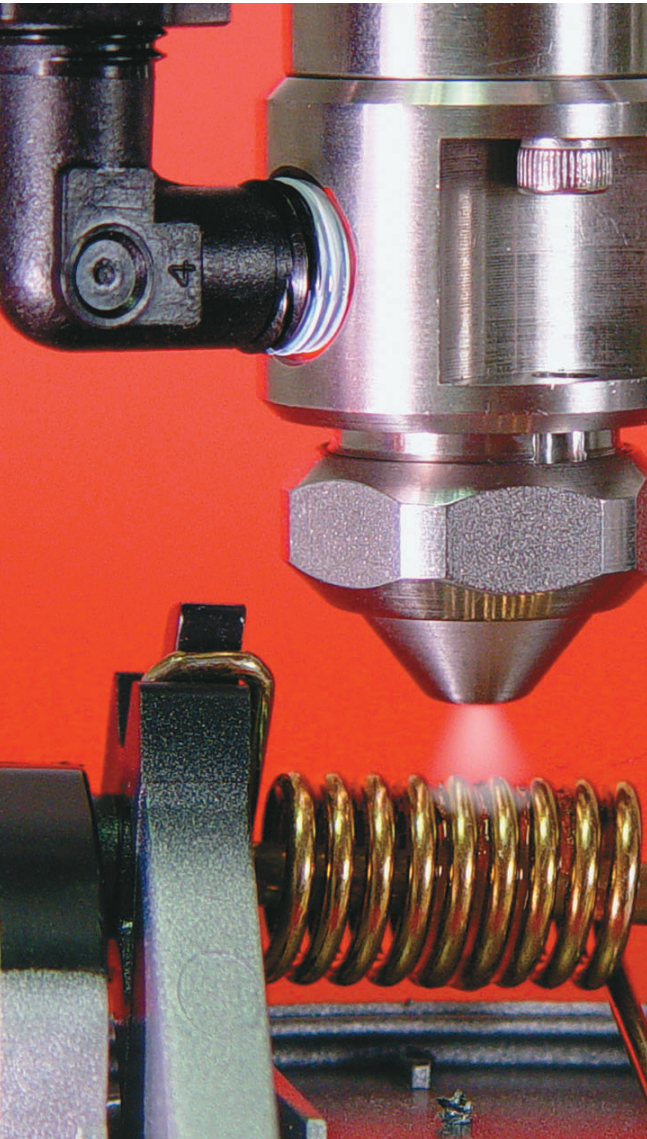
Easy Part Number Search

Easily locate all of the 3D and 2D CAD models of EFD valves, controllers, It's easy to search our digital catalog to find products based on part numbers and keywords.

[Digital Catalog](#)

Automotive Solutions

Request More Information



Nordson EFD's worldwide network of experienced product application specialists are available to discuss your dispensing project and recommend a system that meets your technical requirements and budget.

Call or email us for a consultation.

800.556.3484

info@nordsonefd.com

www.nordsonefd.com/recommendations

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