

# CANNULAE & Catheters

Polymer Solution Casting



**Nordson**  
MEDICAL

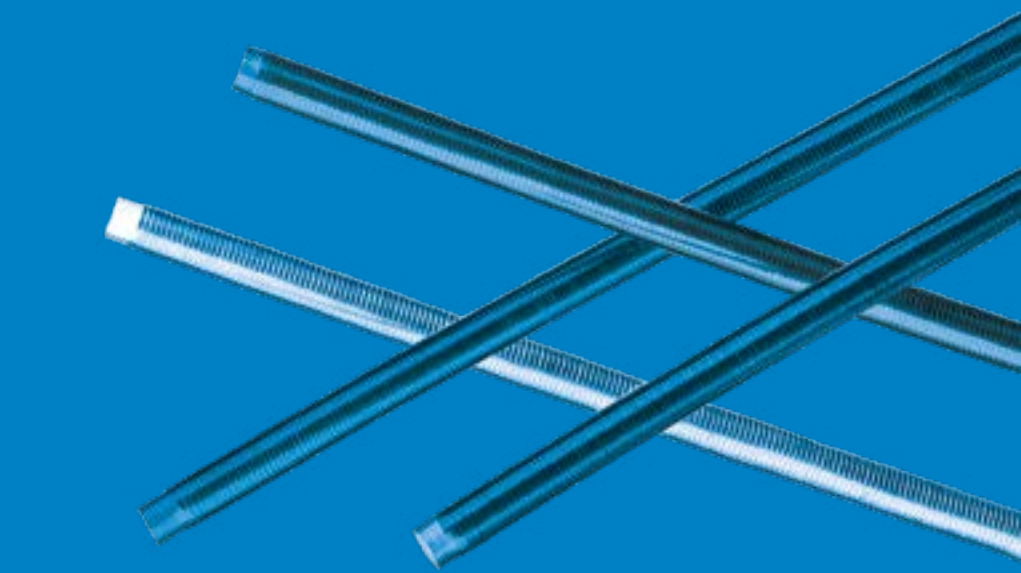
# Nordson MEDICAL

Nordson MEDICAL is your partner in the global life sciences market providing innovative components, devices and custom OEM solutions for the precision management and delivery of fluids and biomaterials. The company has expanded through an aggressive strategy of product development and acquisition and has become a leader in developing products for the application of biomaterials and sterile fluids. Nordson MEDICAL products are sold across a wide variety of clinical specialties.

In 2014 Avalon Laboratories, LLC was acquired by Nordson Corporation (NASDAQ: NDSN), one of the world's leading producers of precision dispensing equipment that applies adhesives, sealants, coatings and other materials to a broad range of consumer, industrial and medical products. The company also manufactures equipment used in the testing and inspection of electronic components as well as technology-based systems for curing and surface treatment processes. Headquartered in Westlake, Ohio, Nordson has direct operations and sales support offices in more than 30 countries.

As an assurance of continued quality and innovation, the Avalon name will transition to a product line brand, Avalon Catheter Solutions.





# AVALON

Catheter Solutions

Nordson MEDICAL offers polymer science, unique engineering technology and innovation to provide new and distinctive Avalon custom catheter solutions for medical device companies. Customer ideas quickly take shape into robust, feature-rich, quality medical devices.

Since 1990 we have been recognized as the leader in the manufacture of wire reinforced cannulae for cardiac surgery. Over eighty percent of the cannulae used worldwide are produced at one of our FDA registered manufacturing sites.

Nordson MEDICAL utilizes liquid polymers to produce reinforced tubing for medical devices. Polymer solution casting™ can achieve both flexibility and pushability along a catheter shaft by utilizing polymer layers to encapsulate multiple components and reinforcements such as braids, coils and hypotubes. This technology lends itself to varying wall thicknesses and diameters along the length of the device in a single piece construction while maintaining tight tolerances.

# ADVANCED

Technology

## Multitude of Product Options and Capabilities

Nordson MEDICAL removes some of the barriers of extrusion technology for custom catheters, shafts and assemblies without compromising on product quality, features and functionality.

Our technology provides a multitude of design options while streamlining manufacturing processes for improving manufacturability and reliability.

### Shapes

- Single and multi-lumen
- Complex geometric designs

### Embedded Reinforcement/Features

- Coiling and braiding (flat, round wire)
- Hypotubes
- Malleable and laser cut wires
- Radiopaque/imaging targets (marker bands, tantalum dots)
- Medical grade stainless steel or nitinol

### Tubing/Shaft Features

- Kink resistant
- Column strength
- Varying durometer or wall thickness along the length
- Lubricious inner and/or outer surface

### Hubs, Luers, Caps and Connectors

- Custom or standard colors
- Hub bonding





# MANUFACTURING

Excellence

## Secondary Operations

Secondary operations include pad printing, tipping, skiving, hole punching, bending, forming, bonding, custom branding, packaging and labeling.

## Contract Manufacturing

- Sub-assembly
- Fully finished devices
- Pilot manufacturing
- Packaging (kits, labels)
- Supply chain solutions

Nordson MEDICAL offers manufacturing and assembly options for medical device manufacturers to assist with production resource management. Customers are provided complete manufacturing options to support a variety of production needs such as cost reductions, line extensions and large scale commercial production releases.

## Markets Served

- Bariatrics/Obesity
- Cardiology/Vascular
- Cardiovascular
- Endoscopy
- Extracorporeal Life Support
- Neurovascular
- Oncology
- Peripheral Vascular
- Pulmonary/Respiratory
- Structural Heart and Valve Therapy
- Vascular

And More...

# SOPHISTICATED

Engineering

## Materials

Nordson MEDICAL's polymer solution casting utilizes liquid polymers throughout the medical device or tubing resulting in unique and specialized designs unobtainable by extrusion technology. Our experienced material engineers work with customers to get the right material properties to meet your medical device performance needs.

## Materials include:

- Polyurethanes
- Polyvinyl chloride
- Silicone urethane copolymers
- Custom formulations, compounds and blends
- Custom colors

We'll assist in identifying critical specifications, selecting appropriate materials for your application, review your specifications to take advantage of our polymer solution casting capabilities, and implement any test methods to support your medical device needs.

- Testing services include: flow and fluid, mechanical properties, chemistry, bench testing and material properties
- Rapid prototyping with on-site production capabilities
- On-site tooling and fixturing capabilities





# COMMITMENT

To Quality and Consistency

## Quality and Regulatory

Nordson MEDICAL Avalon Catheter Solutions is a contract manufacturer for many of the top medical device manufacturers in the global healthcare industry. We currently operate two FDA registered and ISO 13485 certified facilities. Dekra is our Registrar for the ISO certification. Our Quality Management System is designed to ensure compliance with FDA Quality System Requirements (21 CFR 820) as well as requirements of ISO 13485 and associated standards.

## Facilities

Our state-of-the-art production facilities offer a unique combination of high-quality clean rooms and production equipment, with a skilled workforce capable of producing reliable products in high volumes, cost-efficiently.

Expansive production clean rooms, multiple machine shops/tool-rooms, training facilities, and offices for material planning, supply chain management, manufacturing engineering, quality engineering and quality control.



Nordson MEDICAL is the partner of choice in the global life sciences market with innovative development and design expertise, comprehensive regulatory support, and broad manufacturing and packaging capabilities. For over 30 years, Nordson MEDICAL has been a provider of innovative products and has earned a solid reputation for quality, service and reliability. All of our products and services are backed by Nordson Corporation, a global leader in precision dispensing equipment serving many consumers and industrial manufacturing industries, helping customers succeed.

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