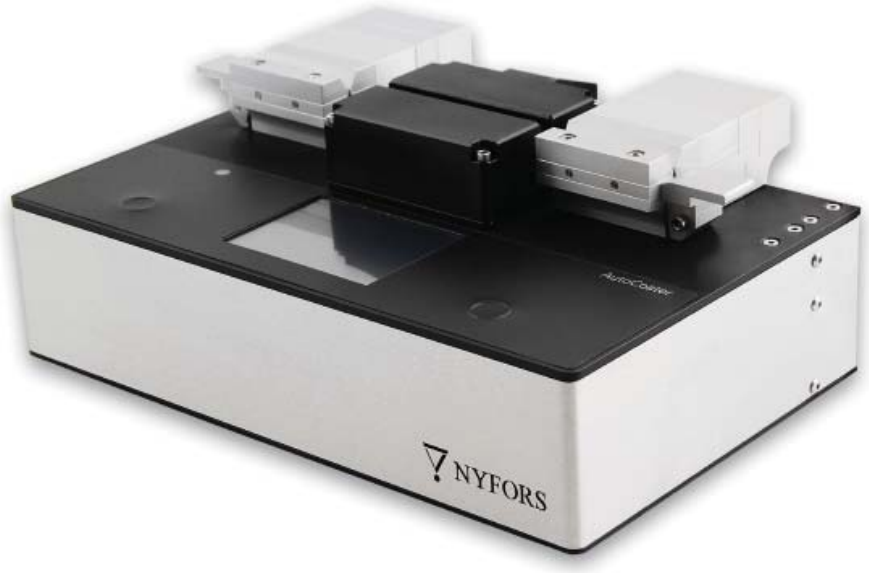
NYFORS™

Recoater 2-series™

The world's most flexible and adaptable recoaters for research, development and production



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The world's most flexible and adaptable recoaters for research, development and production

Designed to meet the varying demands of today's fiber optics industry, the Recoater 2-series is a versatile product platform that can be customized for a range of different applications.

Three different models – the manual MiniCoater™ and ReCoater™, and the fully automatic AutoCoater™ – can be selected with different types of recoating moulds – rigid moulds in a fixed mounting or quickly interchangeable soft silicone moulds. Both the ReCoater™ and the AutoCoater™ may be selected with optional linear proof testing or rotary tensile testing capability.

Mould options

Exchangeable silicone moulds are available in two lengths – standard or extended length – and different sizes are available to cover a range of fiber coating diameters. Silicone moulds can also be customized on request to meet customer-specific requirements. These soft moulds are used in the manual recoaters and can be selected with the AutoCoater™.

For standardized industrial production, the AutoCoater™ is also available with a long-lasting rigid mould in a fixed mounting. Recoating resin is automatically injected into the mould at programmable speed and quantity, and cured through the transparent walls of the mould. The rigid mould is very durable and designed to produce consistent, high quality recoatings over a long period of time – making it the ideal choice for economic, high-volume fiber processing.

Recoating shapes – uniform diameter, overcoating and undersize

Silicone moulds are easily exchangeable with no realignment required. With different sizes and custom moulds available, the operator can choose whether to do recoatings (a) to a diameter that matches the original fiber diameter (uniform diameter), (b) to a diameter slightly smaller than the original fiber coating (undersize), or (c) with a diameter larger than the original fiber coating such that the recoat overlaps the primary coating at each end (overcoating).

This provides a convenient way to swiftly change between different types of optical fibers in both industrial production and research and development operations, and also makes the system easily adaptable for different recoating applications.

With the standard silicone moulds, the restored part of the fiber coating has a diameter that is identical to that of the original fiber (uniform diameter). With custom moulds smaller undersize recoatings or larger diameter overcoatings can be created. Manufacturers of undersea optical fiber cables have long used and appreciated NYFORS silicone mould recoaters for their capacity to provide undersize recoating for optical fibers with high precision, while overcoating is a useful feature in other applications such as fiber laser manufacturing.

The possibility to choose between three different recoat shapes is a feature that makes NYFORS recoaters highly adaptable to various applications. To the left a recoating that matches the original fiber coating (uniform diameter), in the middle a recoating with a cross section slightly smaller than the original fiber coating (undersize), and to the right one that overlaps the original fiber coating at the end points (overcoating). NYFORS silicone mould recoaters can be configured for all three shapes, while the rigid mould AutoCoater™ performs overcoats with diameters slightly larger than the primary fiber coating.

The rigid mould version of the AutoCoater™ produces recoats with a diameter slightly larger than the original fiber coating, and that therefore overlaps the original fiber coating at each end of the recoat area (overcoating). Unlike the silicone moulds, the rigid mould system cannot be configured for either uniform diameter recoating or undersize recoating (this is also the case with other glass mould recoaters on the market).

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The world's most flexible and adaptable recoaters for research, development and production

Curing

Short curing times – and correspondingly low cycle times – are achieved through a highly efficient UV LED array arranged along the entire length of the mould. Curing times depend on the fiber and fiber coating diameter and also on the properties of the customer-selected recoating resin, but are typically as short as 3 seconds which allows for very fast fiber processing. For the AutoCoater™, the efficient light source and high degree of automation combine for a total cycle time of less than 15 seconds from initial fiber positioning through the concluding linear proof test – faster than any competing recoater on the market.

Low index recoating

In addition to providing short curing times, the highly efficient UV LED light source also makes it possible to cure low-index compounds used in fiber laser manufacturing. For more information about which specific compounds can be cured, please contact us or one of our representatives.

Strength testing

Both linear and rotary strength testing are available as options with the ReCoater™ and AutoCoater™. Linear proof tests can be performed up to 22 N, while the rotary mandrels allow for tensile tests with forces up to 100 N.

Levels of test force, pulling rate and hold time at maximum force are programmable. Linear clamps are carefully designed so that the primary coating is not damaged. Clamping force is software controlled and can be set to different levels. This ensures that the fiber coating is not damaged in the recoating process due to excessive clamping force.

Operation and ergonomics

All recoaters come in an ergonomic bench-top design for comfortable operation. The MiniCoater™ has a simple two button control with a three digit display, while the ReCoater™ and AutoCoater™ utilize a user-friendly GUI on a touch screen control panel interface with an easy-to-navigate menu.

Network & interconnection

The ReCoater™ and the AutoCoater™ also feature an Ethernet interface for remote monitoring and supervision. Statistics and information about system status and use can be collected via a web interface. Versatile Application Programming Interface (API) software makes it possible to create custom programs through which the recoaters can be integrated into larger industrial production systems.

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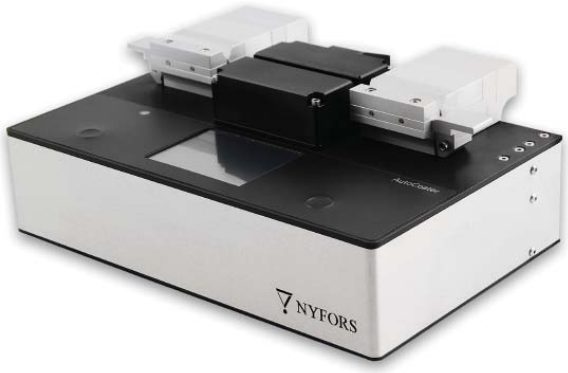
AutoCoater™ *NEW*

Automatic recoater for production applications



- Consistent, high quality recoating
- Automatic and operator independent
- Short cycle time
- Rigid and soft mould options
- Linear and rotary strength testing
- Overcoating capability with rigid moulds
- Overcoating as well as uniform and undersize recoat diameter capability with soft moulds
- Easy exchange of recoating resin type
- No need for compressed air or vacuum

Designed for high strength applications, the AutoCoater™ restores the protective coating on spliced acrylate-coated optical fibers. It is fully automatic, allowing for operator skill independence in factory environments with high productivity and cost advantages.

Available with two mould options – rigid moulds in a fixed mounting or rapidly exchangeable soft silicone moulds – the AutoCoater™ platform can be customized for a variety of different recoating applications.

AutoCoater™ with rigid moulds

In the rigid mould version, the resin is automatically injected into the mould at programmable speed and quantity, and cured through the transparent walls of the mould.

The rigid mould is designed to produce consistent, high quality recoatings over a long period of time which makes it well suited for standardized high volume production. Due to the robustness of the rigid moulds, mould replacement will seldom if ever be required, enabling continuous factory operation over many years with very little in the way of routine maintenance requirements. The rigid mould AutoCoater™ is therefore the ideal choice for high-volume production recoating or continuous recoating to the same specifications.

AutoCoater™ with soft moulds

In the silicone mould version, the AutoCoater™ is used with soft moulds identical to those used in the NYFORS line of manual recoaters. The recoating compound is automatically injected via the injection pump and needle.

Silicone moulds are easily exchangeable with no realignment required. With different sizes and custom moulds available, the operator can not only easily exchange moulds to meet requirements for different fiber and fiber coating diameters, but he can also choose whether to (a) recoat to uniform diameter that exactly matches the original fiber coating diameter, (b) recoat with a cross section slightly smaller in diameter than the original fiber coating (undersize), or (c) recoat with a larger diameter that overlaps the primary coating at each end of the recoat section (overcoating).

This provides a convenient way to swiftly change between different types of optical fiber and also makes the system easy to set up, optimize and rapidly reconfigure for different recoating applications and requirements.

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Automatic recoater for production applications

The AutoCoater™ with silicone moulds is therefore the ideal choice for fully automatic skill-independent recoating operations where flexibility is required to meet many different recoating needs and specifications.

Rapid exchange of recoating resin type

Both the rigid mould and soft mould AutoCoater™ models automatically inject the customer-selected recoating compound from an easily attached 1 oz Nalgene bottle. The 1 oz bottle functions as the recoater reservoir tank. This greatly simplifies refilling in high volume production.

In the case of the soft mould AutoCoater™, the 1 oz bottle as well as the injection pump, supply lines, and injection needle may be removed and exchanged as a single unit. This completely eliminates the need to purge or cleanse the injection pump and supply lines when changing from one type of recoating resin to another.

The combination of mould sizes and mould types (for uniform and undersize recoating as well as overcoating) and the simplicity of exchanging recoating compounds underscores the flexibility of the soft mould AutoCoater™ as the most versatile and easily adaptable automatic recoater in the world.

Other AutoCoater™ features

Short curing times are achieved through an efficient UV LED array arranged along the length of the mould. Curing times depend on the fiber and fiber coating diameter as well as the properties of the customer-selected recoating resin, but are typically as short as 3 seconds which allows for very fast recoating operations with total cycle times of 15 seconds or less – faster than any competing recoater on the market.

Both a linear and a rotary strength tester are available as options. Linear proof tests can be performed up to 22 N, while the rotary mandrels allow for tensile tests with forces up to 100 N. Levels of force, pulling rate and hold times at maximum force are programmable. Clamping force is software controlled and can be set to different levels.

The AutoCoater™ comes in an ergonomic, bench-top design for comfortable operation. The main operator interface is a user-friendly and easy-to-navigate GUI on the touch screen control panel. System software supports storable and user-defined programs for easy process change. Remote monitoring and supervision can be carried out through an Ethernet interface.

TECHNICAL DATA	
Curing time	Programmable, 3 s typical
Cycle time	15 s typical
Light source	UV LED
Wavelength	380-385 nm
Injection	Automatic from 1 oz bottle
RIGID MOULD	
Mould mounting	Fixed
Mould length	55 mm
Recoating diameter (µm)	200, 280, 450, 1100*
Dimensions	270 mm (W) x 182 mm (D) x 96 mm (H)
Weight	4.5 kg
SOFT MOULD	
Mould mounting	Exchangeable
Mould length	55 mm
Recoating diameter	165, 250, 300, 400, 900*
Dimensions	270 mm (W) x 210 mm D) x 100 mm (H)
Weight	4.5 kg
PROOF TESTING (optional)	
Linear proof test	Programmable, 0-22 N
Rotary tensile test	Programmable, 0-100 N
Resolution	0.01 N
Hold time & pulling speed	Programmable
Display units	lbs, kg, N, kpsi, GPa
INTERFACE	
PC connection	Ethernet & USB flash drive
Compressed air	Not needed
Power supply	External 12 V DC, 60 W

NYFORS part number: 42000000

* Custom moulds available

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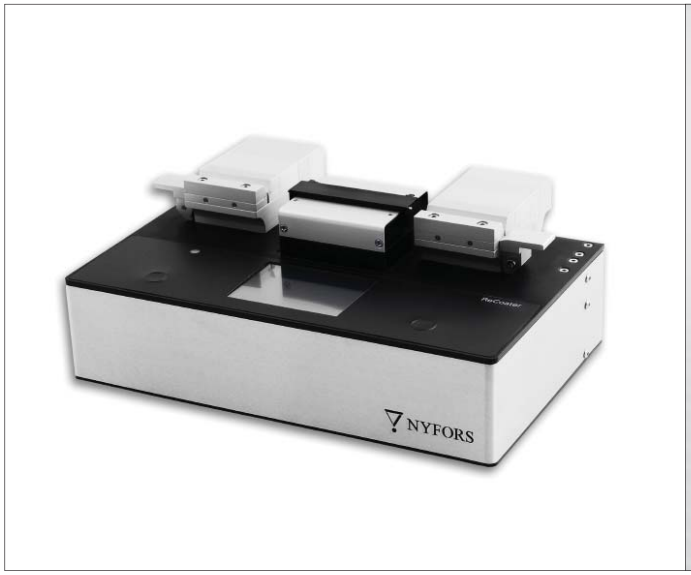
ReCoater™ *NEW*

High quality recoating and strength testing



- Consistent, high quality recoating
- Easy mould exchange and replacement
- Handles most fiber dimensions, with custom moulds available
- Uniform diameter, overcoating and undersize recoating capability
- Short curing times
- High and low-index recoating
- Linear or rotary strength testing

The ReCoater™ is used to restore the protective coating on acrylate-coated optical fibers in high strength applications. It is available with two mould options – standard (55 mm) and extended (110 mm) length moulds.

Both mould types are easily exchangeable with no realignment required. With different mould sizes available to meet the needs of different fiber and fiber coating diameters, the operator can also choose whether to create a uniform diameter recoat that matches the original fiber coating diameter, or perform recoating with a cross section slightly smaller than the original fiber coating (undersize), or recoatings with a larger diameter that overlaps the original fiber coating at each end of the recoat area (overcoating).

This makes the system easy to set up and optimize for such different applications as undersea optical fiber cable assembly and fiber laser manufacturing.

Injection of the recoating compound is performed manually. While this does require a manual user operation, it also ensures flexibility because the user can immediately switch from one type of recoating compound to another (e.g. from a high-index recoating material to a low-index material) without any need to flush out a recoater reservoir and injection pumping system.

This, in addition to the rapidly exchangeable mould sizes and shapes (for uniform diameter and undersize recoating as well as overcoating), ensures the flexibility and adaptability of the ReCoater™.

Short curing times are achieved through an efficient UV LED array, arranged along the length of the mould. Curing times depend on the fiber and fiber coating diameter as well as the properties of the customer-selected recoating resin, but are typically as short as 3 seconds which allows for very fast recoating operations. The highly efficient light source also makes it possible to cure low-index recoating compounds used in fiber laser manufacturing.

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High quality recoating and strength testing

With standard length moulds, both a linear proof tester and a rotary tensile tester are available as options. Linear proof tests can be performed up to 22 N, with programmable levels of force, pulling rates and hold time at maximum force. Tensile tests can be performed with rotary mandrels with forces up to 100 N. Linear clamps are carefully designed so that the primary coating is not damaged. Clamping force is software controlled and can be set to different levels.

The ReCoater™ comes in an ergonomic, bench-top design for comfortable operation. The main operator interface is an easy-to-navigate and user-friendly GUI on the touch screen control panel. System software supports storable and user-defined programs for easy process change. Remote monitoring and supervision can be carried out through an Ethernet interface.

TECHNICAL DATA	
Curing time	Programmable, 3 s typical
Light source	UV LED
Wavelength	380-385 nm
Mould material	Silicone
Mould mounting	Exchangeable
Mould length	55 mm or 110 mm
Recoating diameter (µm)	165, 250, 300, 400 & 900*
PROOF TESTING (optional)	
Linear proof test	Programmable, 0-22 N
Rotary tensile test	Programmable, 0-100 N
Resolution	0.01 N
Hold time	Programmable
Pulling speed	Programmable
Display units	lbs, kg, N, kpsi, GPa
INTERFACE & DIMENSIONS	
PC connection	Ethernet and USB flash drive connection
Power supply	External 12 V DC, 60 W
Compressed air	Not needed
Dimensions	270 mm (W) x 170 mm (D) x 98 mm (H)
Weight	3.9 kg

NYFORS part number: 22000000

*Custom moulds available

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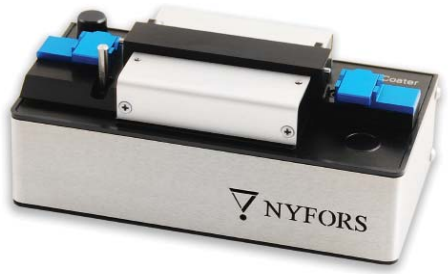
MiniCoater™ *NEW*

Compact recoater for research, development and production operations



- Compact design
- Easy mould exchange and replacement
- Handles most fiber dimensions, with custom moulds available
- Uniform diameter, overcoating and undersize recoating capability
- Short curing times
- High and low-index recoating
- Runs on built-in, rechargeable battery or AC adapter
- Small, lightweight, highly portable
- High and uniform recoating quality

This compact and easy-to-use recoater is based on NYFORS' proven silicone mould technology which has been developed and refined in the course of the last twenty years. Moulds are available in different sizes to cover a range of coating diameters and can easily be exchanged by the operator with no realignment required. Custom moulds are available on request.

With the standard moulds the recoated part of the fiber is round with a cross section that perfectly and uniformly matches that of the original fiber coating, but moulds can also be selected for both overcoating and undersize recoating of optical fibers. These features makes the MiniCoater™ well suited for research and development operations and small scale production where the fiber type and dimensions need to be changed frequently.

Injection of the recoating compound is performed manually. While this does require a manual user operation, it also ensures flexibility because the user can immediately switch from one type of recoating compound to another (e.g. from a high-index recoating material to a low-index material) without any need to flush out a recoater reservoir and injection pumping system. This, in addition to the rapidly exchangeable mould sizes and shapes (for uniform diameter and undersize recoating as well as overcoating), ensures the flexibility and adaptability of the MiniCoater™. Short curing times are achieved through a highly efficient UV LED array, which also has the ability to cure low-index recoating compounds used in fiber laser manufacturing.

The MiniCoater™ has a simple two button control with a three digit display and comes in a small bench-top design. The small size and light weight of the MiniCoater™ makes it ideal for situations where the recoater must be frequently moved from one lab or production area to another. The small size also facilitates easy ergonomic integration into a production work bench where space is at a premium. In addition, since the MiniCoater™ may be operated by battery power, and also due to the small size and weight, it is well suited to recoating in a remote field environment such as an oil drilling platform, or for other uses where a high degree of portability is required.

TECHNICAL DATA	
Curing time	Programmable, 3 s typical
Light source	UV LED
Wavelength	380-385 nm
Mould material	Silicone
Mould length	55 mm
Recoating diameter (µm)	165, 250, 300, 400 & 900*
Power supply	Battery or external 12 V DC, 40 W
Dimensions	150 mm (W) x 77 mm (D) x 60 mm (H)
Weight	0.7 kg

NYFORS part number: 12000000

*Custom moulds available

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