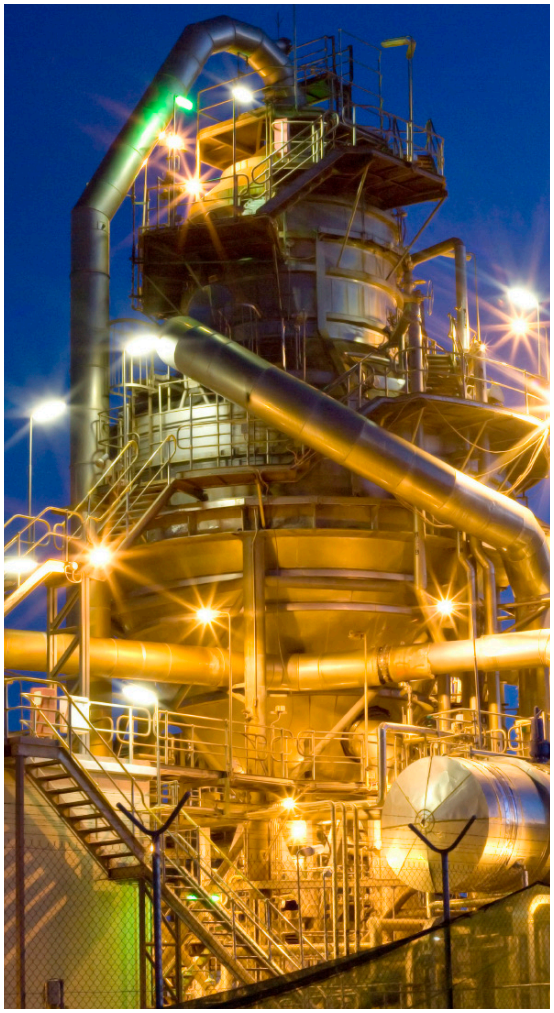
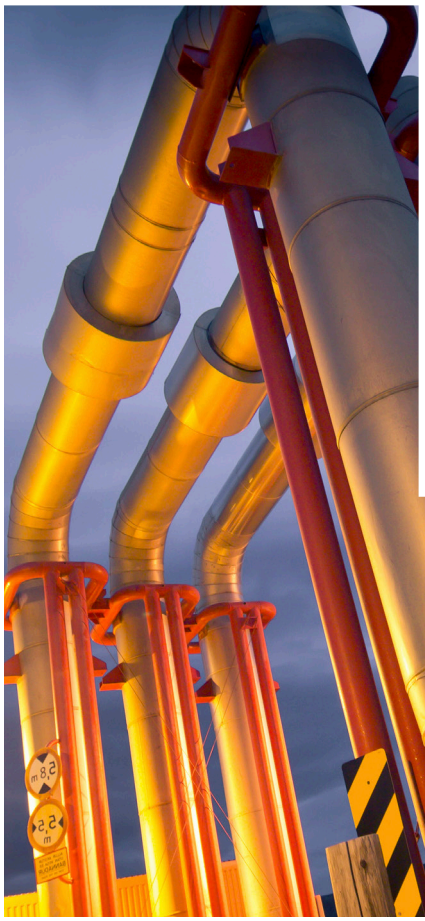
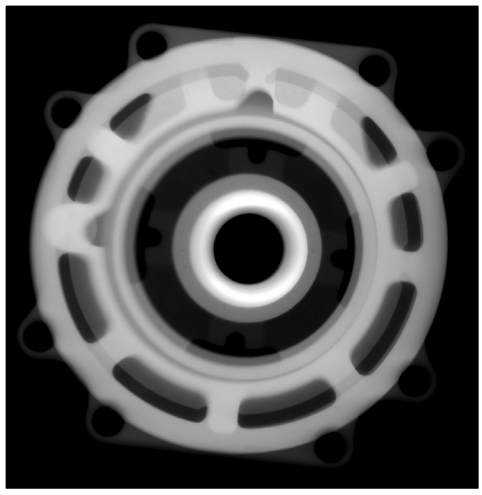
# Carestream INDUSTREX Film

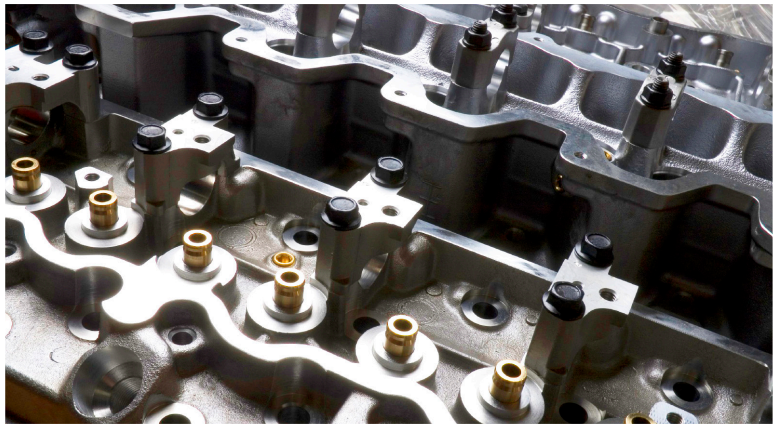
## For Non-Destructive Testing

**WHEN CLARITY IS CRITICAL**









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## INDUSTREX Film Products

INDUSTREX Film

INDUSTREX Chemicals

INDUSTREX M37 *PLUS* Processor

INDUSTREX M43ic Processor

INDUSTREX Products support the evolving requirements of the non-destructive testing market. Our experience in imaging science spans over one hundred years. But it's an unbreakable commitment to product innovation and customer service that has allowed the INDUSTREX line of products to achieve superiority in the NDT industry.

Our film, chemical and processor products represent turnkey radiography solutions for non-destructive testing applications. We understand that dynamic testing environments can cause uncertainties in the operations of important projects. Our reliable product line works under the most trying conditions and provides customers consistent, predictable results every time. With the support of world-leading imaging experts and world-class service and support INDUSTREX technology is your best choice within the most demanding test environments.

### INDUSTREX Films
### Get the T-Grain Emulsion Advantages

T-GRAIN Emulsion offers a state-of-the-art technology that's specifically designed for industrial radiographic testing applications. What does that mean for you?

### Outstanding Image Quality

With a cold, clean image tone and low noise, you get a sharp, clear image every time.

### Convenient Processing Flexibility

The films work well in standard process cycles—but they're just as effective in longer or shorter process cycles.

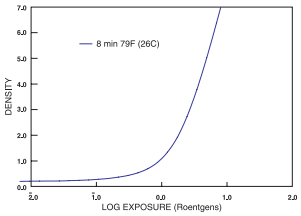
### Superb Durability

The films are static resistant, more heat resistant than conventional systems, incredibly sturdy, and you'll get fewer artifacts from handling.

### Film Characteristics (Sensitometric)

ISO/EN exposure conditions: 200/220 kV, lead screens; INDUSTREX Single Part Developer Replenisher and INDUSTREX LO Fixer and Replenisher.

## INDUSTREX DR50 Film




**Exposure:** 220 kV Direct X-rays with lead screens
**Processing:** INDUSTREX Processor and INDUSTREX Chemicals
**Densitometry:** Diffuse Visual

INDUSTREX DR50 Film is specifically designed for use in multi-film techniques in your demanding radiographic environment. With both high-voltage x-rays and gamma rays, DR50 will deliver consistently high contrast, very fine granularity, and superior sensitivity to meet your testing needs. It incorporates Carestream Health's patented T-GRAIN Emulsion technology for superb results with direct x-rays or lead foil screens.

### The Basics

DR50 Film is an extremely durable slow-speed film with very fine grain. It withstands high temperature and high humidity, and resists both handling and static artifacts. This film is classified as ASTM E 1815 Class Special and EN ISO 11699-1 Class 1.

### Processing Options

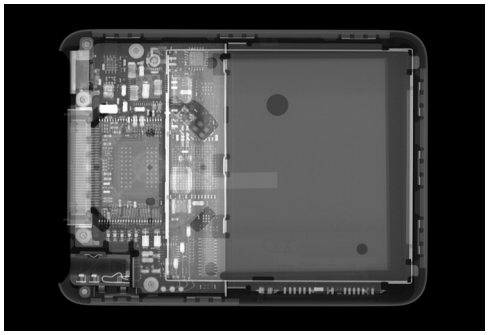
DR50 Film can be processed manually or automatically in a range of processing cycles. Notice: Observe precautionary information on product labels and Material Safety Data Sheets. Develop with rack and tank, using properly replenished solutions.

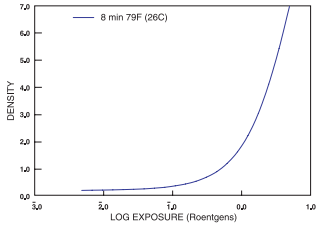
### Idea For

Aircraft inspection, Assemblies, Castings, Electrical Components, Composite (fibre-reinforced), Forensics, Munitions, Bomb Disposal, Nuclear Applications, Welded Fabrication

| INDUSTREX Processors/Cycles | Base + Fog | Contrast[1] |
|---|---|---|
| M43ic—8 min 79°F (26°C) | 0.19 | 5.4 |
| M43ic—5 min 86°F (30°C) | 0.20 | 5.55 |

## INDUSTREX M100 Film






**Exposure:** 220 kV Direct X-rays with lead screens
**Processing:** INDUSTREX Processor and INDUSTREX Chemicals
**Densitometry:** Diffuse Visual

INDUSTREX M100 Film gives you outstanding sharpness—in fact, we've set the standard in this industry. The film's excellent sensitivity and low speed make it the perfect choice for critical inspections of a wide range of materials. You'll have confidence that you'll find what you're looking for—whether it's a pipe weld, an aerospace engine, or a sculpture that you're imaging.

### The Basics

M100 Film is an ASTM E 1815 Class I and EN ISO 11699-1 Class II film that offers very fine grain with extremely high contrast and definition. And it's versatile—you can use it with direct x-rays or with lead foil screens.

### Processing Options

M100 Film can be processed manually or automatically in a range of processing cycles. Notice: Observe precautionary information on product labels and Material Safety Data Sheets. Develop with rack and tank, using properly replenished solutions.

### Idea For

Aircraft inspection, Aero-engines, Assemblies, Electrical Components, Castings, Composites (fibre-reinforced), Forensics, Munitions, Bomb Disposal, Nuclear, Paintings/Sculptures, Pipelines, Welded Fabrication

| INDUSTREX Processors/Cycles | Base + Fog | Contrast[1] |
|---|---|---|
| M43ic—8 min 79°F (26°C) | 0.19 | 5.4 |
| M43ic—5 min 86°F (30°C) | 0.19 | 5.25 |

[1]Contrast calculated between net densities of 1.5 and 3.5.

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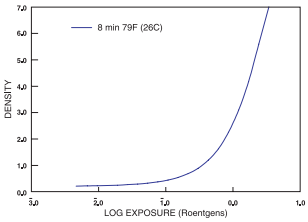
## INDUSTREX MX125 Film




**Exposure:** 220 kV Direct X-rays with lead screens
**Processing:** INDUSTREX Processor and INDUSTREX Chemicals
**Densitometry:** Diffuse Visual

Simply put, INDUSTREX MX125 Film is tough. Tough as nails. Its static resistance is unparalleled in the industry, and its heat resistance is remarkable. The film is extremely durable; it can withstand the toughest handling (and even darkroom practices). It can also survive high humidity, and it's much less susceptible to handling artifacts than most films.

### The Basics

MX125 Film incorporates Carestream's patented T-GRAIN Emulsion technology. This medium-speed film offers very fine grain and very high contrast. It has excellent sensitivity, so it's perfect for critical radiography—especially with high energy. You can use it with direct x-rays or with lead foil screens. This film is classified as ASTM E 1815 Class I and EN ISO 11699-1 Class III.

### Processing Options

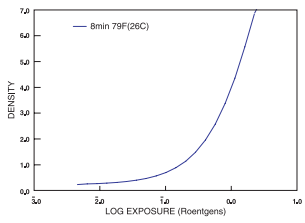
MX125 Film can be processed manually or automatically in a range of processing cycles. Notice: Observe precautionary information on product labels and Material Safety Data Sheets. Develop with rack and tank, using properly replenished solutions.

### Idea For

Aircraft inspection, Aero-engines, Assemblies, Electrical components, Castings, Composites (fibre-reinforced), Forensics, Munitions, Bomb Disposal, Nuclear, Paintings/Sculptures, Pipelines, Welded Fabrication

| INDUSTREX Processors/Cycles | Base + Fog | Contrast[1] |
|---|---|---|
| M43ic—8 min 79°F (26°C) | 0.20 | 5.15 |
| M43ic—5 min 86°F (30°C) | 0.20 | 5.05 |

## INDUSTREX T200 Film




**Exposure:** 220 kV Direct X-rays with lead screens
**Processing:** INDUSTREX Processor and INDUSTREX Chemicals
**Densitometry:** Diffuse Visual

INDUSTREX T200 Film is recommended for critical imaging applications, since it can be used in multiple film loads to provide you with an extended imaging range. Best of all, it incorporates Carestream Health's patented T-GRAIN Emulsion technology.

### The Basics

T200 Film is a medium-speed, high-contrast film with very fine grain. This Film is an EN ISO 11699-1 Class 4 film and our fastest ASTM E 1815 Class I film. T200 Film can withstand high temperatures, and it's less susceptible to handling and static artifacts. It's also versatile—you can use it with direct x-rays or with lead foil screens.

### Processing Options

T200 Film can be processed manually or automatically in a range of processing cycles. Notice: Observe precautionary information on product labels and Material Safety Data Sheets. Develop with rack and tank, using properly replenished solutions.

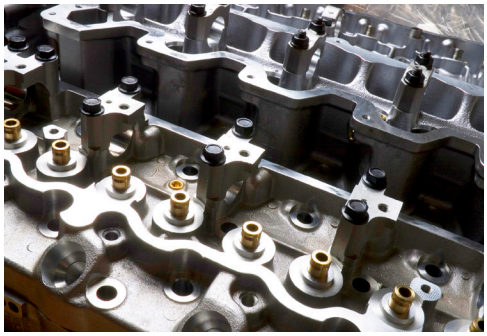
### Idea For

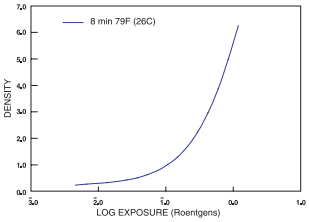
Aircraft inspection, Aero-engines, Assemblies, Electrical components, Castings, Composites (fibre-reinforced), Forensics, Munitions, Bomb Disposal, Nuclear, Paintings/Sculptures, Pipelines, Welded Fabrication

| INDUSTREX Processors/Cycles | Base + Fog | Contrast[1] |
|---|---|---|
| M43ic—8 min 79°F (26°C) | 0.20 | 4.7 |
| M43ic—5 min 86°F (30°C) | 0.20 | 4.7 |

[1]Contrast calculated between net densities of 1.5 and 3.5.

## INDUSTREX AA400 Film






**Exposure:** 220 kV Direct X-rays with lead screens
**Processing:** INDUSTREX Processor and INDUSTREX Chemicals
**Densitometry:** Diffuse Visual

INDUSTREX AA400 Film is extremely versatile, which makes it a great solution for many industrial applications. You can use it in multiple-film radiography and in single-film techniques—and with direct x-rays or with lead foil screens. Best of all, AA400 Film incorporates Carestream's patented T-GRAIN Emulsion technology.

### The Basics

AA400 Film is an ASTM E 1815 Class II and EN ISO 11699-1 Class 5 film that offers high speed, high contrast and gives you a fine-grain image. This film offers incredibly robust handling characteristics. It can withstand high temperatures and humidity, and it is resistant to static artifacts—so you get the image you need, whatever the conditions you're working under.

### Processing Options

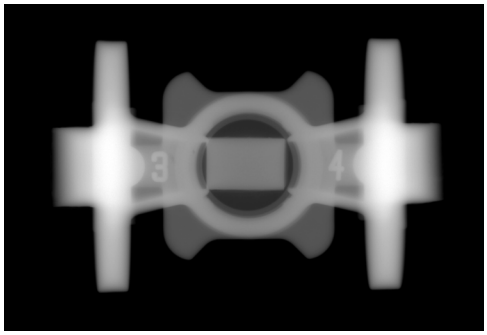
AA400 Film can be processed manually or automatically in a range of processing cycles. Notice: Observe precautionary information on product labels and Material Safety Data Sheets. Develop with rack and tank, using properly replenished solutions.

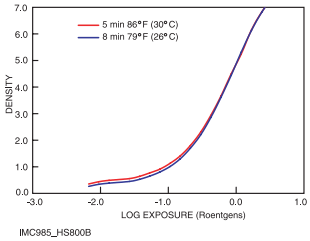
### Ideal For

Aircraft inspection, Aero-engines, Archeological artifacts, Assemblies, Castings, Concrete, Electrical components, Forensics, Forestry, Munitions, Bomb Disposal, Nuclear, Pipelines, Tires, Welded Fabrication

| INDUSTREX Processors/Cycles | Base + Fog | Contrast[1] |
|---|---|---|
| M43ic—8 min 79°F (26°C) | 0.20 | 4.7 |
| M43ic—5 min 86°F (30°C) | 0.20 | 4.65 |

## INDUSTREX HS800 Film






**Exposure:** 220 kV Direct X-rays with lead screens
**Processing:** INDUSTREX Processor and INDUSTREX Chemicals
**Densitometry:** Diffuse Visual

INDUSTREX High-Speed HS800 Film is our most versatile film for non-destructive testing. Use one film for any exposure method: direct x-rays, lead screen, fluorescent screen, or fluorometallic screen. Combined with LANEX Fast Screens, this film offers more speed than any film-screen combination available today.

### The Basics

HS800 Film offers high speed and high contrast with Carestream's T-GRAIN Emulsion technology. This medium-grain film can be processed in automatic processing chemicals in the short 5-minute cycle, or manually in a 2-minute cycle. With a cold image tone and high gloss finish, you get the image you need, whatever the conditions you're working under.

### Processing Options

HS800 Film can be processed manually or automatically in a range of processing cycles using INDUSTREX Single Part Developer Replenisher and INDUSTREX LO Fixer and Replenisher.

### Ideal For

Thick-wall castings, Concrete, Pipeline and lay barge applications, Bridges, Construction

| INDUSTREX Processors/Cycles | Base + Fog | Contrast[1] |
|---|---|---|
| M43ic—8 min 79°F (26°C) | 0.22 | 4.4 |
| M43ic—5 min 86°F (30°C) | 0.23 | 4.3 |

[1]Contrast calculated between net densities of 1.5 and 3.5.

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## M37 *PLUS* Processor

The tabletop INDUSTREX M37 *PLUS* is ideal for automatic processing in mid-volume facilities. While compact, it offers the output you need and the excellent image quality and reliability you demand. The processor ensures totally automatic film handling and supports nine programmable-controlled processing channels that allows for flexibility in your day-to-day NDT film production.

### THE M37 PLUS PROCESSOR FEATURE SET INCLUDES:

- Nine programmable-controlled processing channels
- 43cm processing width
- Economical medium-range processor with capacity of 33 sheets/hour (35cm x 43cm) in the recommended processing cycle
- Compact design for smaller labs or environments
- Filtered developer solution that reduces film artifacts
- Intermediate rinse rack bath system
- Can be used in stand-alone darkroom or through-the-wall installations
- Automatic film-in detection utilizing a pulsed infra-red sensor bar
- Automatic replenishment system for developer and fixer
- Automatic heating for developer and fixer
- Automatic anti-oxidation and anti-crystallization cycles
- Separate drainage for developer, fixer and wash chemicals
- Factory fitted replenisher tank level control assemblies with a plug connection into the processor
- Incoming water temperature sensor - beeper alarm when wash water temperature is outside the programmed range
- Enhanced cold water cooling system
- Unit pre-configured with connection fittings to simplify installation of optional external chiller
- Automatic wash water top off at start-up

## M43ic Processor

Designed for high-volume Non-Destructive Testing customers, the INDUSTREX M43ic provides multiple processing cycles and dry-to-dry processing in as little as two minutes. This processor also comes standard with an integrated closed-loop chiller to ensure consistent temperature in hot environments or when water supply is not temperature controlled to further enhance capability and image quality in harsh NDT environments.

### THE M43IC PROCESSOR HAS A ROBUST FEATURE SET THAT INCLUDES:

- Up to nine programmable-controlled processing channels for maintaining preferred settings such as processing speed, developer temperature, fixer temperature, dryer temperature and replenishment rate
- High processing capacity of up to 58 sheets/hour (35cm x 43cm) in the recommended processing cycle for improved productivity
- An intermediate fix rinse bath rack system that enhance process uniformity to both sides of the film
- Feed-tray cover that allows for room light operation
- Filtered developer solutions that reduce film artifacts
- Integrated chiller unit that maintains developer temperature in hot environments
- Two 50-liter replenishment storage tanks
- Low level monitoring of all tank solutions
- Automatic “Top-Up“ control that maintains solution levels on processor start up
- Work-in-progress monitoring
- Integrated connectors to an external exhaust air system

IMPROVED STABILITY!

## INDUSTREX Chemicals for Use with Automatic Processors

### INDUSTREX Single Part Developer Replenisher 2x20L

Ideal for 5-minute automatic or 4-minute manual cycles for processing of all NDT films. Single Part Developer Replenisher is an all-in-one developer and replenisher; it is only necessary to add water to the proper dilution.

- High chemical stability for image quality over time, improved resistance to aerial oxidation, clean-working formula
- Reduced packaging, less solid waste
- Strengthened "activation power" allows for fast processing and high productivity
- Outstanding, consistent image quality—cold (blue) image "tone" and low granularity
- Reduced environmental impact—lower COD and BOD5 (5-days Biochemical Oxygen Demand)
- Concentrated (single part) liquid developer provides ease of use
- Working strength SG 1.078

| | |
|---|---|
| INDUSTREX Single Part Developer Replenisher | Catalog Number 5315288 |

### INDUSTREX LO Fixer and Replenisher 2x20L

Recommended for all NDT and industrial imaging films. Offers improved archivability, great for automatic and manual processing, can be used in chemical auto mixers.

- Designed for use in both automatic and manual processing
- Reduced environmental impact—lower COD and BOD5 (5-days Biochemical Oxygen Demand), low odor
- Concentrated (single part) liquid fixer provides ease of use
- Improved archivability
- Working strength SG 1.095

| | |
|---|---|
| INDUSTREX LO Fixer and Replenisher | Catalog Number 5159082 |

## INDUSTREX Chemicals for Use with Manual Processing

### INDUSTREX Manual Developer 2x20L

Manual Developer (2x5L bottles of concentrate) to make 40L/10 gallons. Recommended manual processing development time and temperature is 4 minutes @ 22°C (72°F). Developer is a single part concentrate dilutes 1+3w/H2O; Replenishment rate 665mL/m2 of film; working strength SG 1.078

| | |
|---|---|
| INDUSTREX Manual Developer 2x20L/To make 40L/10 gallons | Catalog Number 5320635 |

### INDUSTREX Manual Fixer 2x20L

Manual Fixer (2x5L bottles of concentrate) to make 40L/10 gallons. Fixer is a single part concentrate dilutes 1+3 w/H2O; Replenishment rate 1200mL/m2 of film; working strength SG 1.095

| | |
|---|---|
| INDUSTREX Manual Fixer 2x20L/To make 40L/10 gallons | Catalog Number 5320643 |

### INDUSTREX Manual Stop Bath

1L bottle of single part concentrate when mixed provides 20L/5 gallons of working strength stop bath solution used in manual processing applications. Manual Stop Bath is odorless and contains a color indicator that turns color at pH 5.2 from orange-yellow to magenta/red when exhausted. Single part concentrate dilutes 1+19 w/H2O

| | |
|---|---|
| INDUSTREX Manual Stop Bath 1X1L/To make 20L/5 gallons | Catalog Number 1054873 |

### INDUSTREX Manual Rinse Solution

1L bottle of single part concentrate when mixed provides 20L/5 gallons of working strength rinsing solution used in manual processing applications. Manual Rinse Solution is a wetting agent that effectively reduces water spots and drying marks on film. Single part concentrate dilutes 1+19 w/H2O

| | |
|---|---|
| INDUSTREX Manual Rinse Solution 1X1L/To make 20L/5 gallons | Catalog Number 1057025 |

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NEW!

# INDUSTREX Chemical Kits for Manual Film Processing

## A Complete System in a Box

Manual film processing presents its own unique set of challenges. Film labs operating in fixed environments are easier to control than mobile labs where space is at premium, environmental conditions change hourly and where routine contamination of the chemicals can contribute to poor image quality and the need to change out chemical tanks regularly. In mobile situations it's also not easy to replenish tanks. Water supply is scarce, measuring tools for mixing are difficult to find and if you didn't plan it well you might not have the right amount of chemicals to get the job done.

Carestream's new Odorless Manual Processing Chemical Kits take the guesswork, and the smell, out of manual processing. Each kit is designed with exactly the right amount of chemicals to fill a normal 10 gallon (40L) developer and fixer mobile lab tank system (including stop bath and rinse solution). Just empty the chemicals into the tank and top it off with water for precisely the right mix. Replenisher is also included to top off the tanks when needed. All you need to do is order two part numbers and you're ready to work!

**The new INDUSTREX Manual Photo Chemicals System consists of four new processing chemicals:**

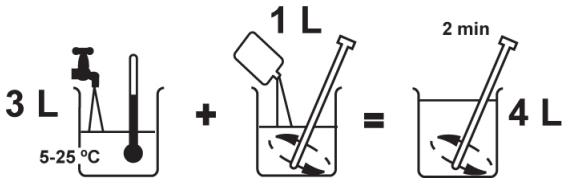
| Description / to make | Material No. |
|---|---|
| INDUSTREX Manual Developer Kit / 2x20L | 1057009 |
| INDUSTREX Manual Fixer Kit / 2x20L | 1057017 |
| INDUSTREX Manual Stop Bath / 20L | 1054873 |
| INDUSTREX Manual Rinse Solution / 20L | 1057025 |

## Features of the New System:

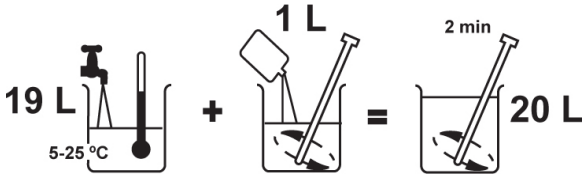
- Easy to use and mix - single part liquid concentrates
  - Developer kit includes Developer, Replenisher, and Stop Bath
  - Fixer kit includes Fixer, Replenisher and Rinse Solution
- Each developer and fixer kit makes 40L/10 Gallons of processing solutions, just the right amount to fill standard manual processing tanks with a single kit.
- Each kit comes with mini-bottles of replenisher concentrate. Enough to make 8L/2 gallons of replenisher
- Chemical bottles are color coded for easy identification in the darkroom
- Chemical bottles are induction sealed to prevent leaking and preserve freshness
- Complete kits are easy to order and take up little storage space in the darkroom
- Each Developer Kit is packaged with an easy to follow manual processing wall chart guide
- Rinse Solution eliminates water spotting and drying marks on processed radiographs

## Easy to Use!

**Developer and Fixer Mix Ratios:**




**Stop Bath & Rinse Mix Ratios:**

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Order Number: INDFILM-EN