

# Processing KODAK INDUSTREX Films



## KODAK INDUSTREX Single Part Developer Replenisher

KODAK INDUSTREX Single Part Developer Replenisher is a universal, single-part concentrate used to process all types of non-destructive testing film. As its name implies, this is a single part liquid concentrate for easy mixing. It is compatible with existing automatic processing cycles of 8 minutes and longer, and allows a shorter processing cycle (5 minutes) for all films.

The developer formula allows high photographic consistency and quality, and ensures an efficient use of the developer when using a low replenishment rate and it also reduces any environmental impact. This developer reduces or minimizes operator maintenance due to crystallization, silver deposits, or sludge.

### Features:

- High chemical stability—includes consistent image quality over an extended period of time, improved resistance to aerial oxidation, and low sludge formation
- Designed for use in both automatic and manual processing
- Reduced packaging, less solid waste
- Glutaraldehyde free
- Strengthened “activation power” which allows for fast processing and high productivity
- Outstanding image quality—cold (blue) image “tone” and low granularity
- Reduced environmental impact—lower COD and BOD<sub>5</sub> (5-days Biochemical Oxygen Demand)
- Concentrated (single part) liquid developer provides ease of use
- Can be used in chemical auto-mixers

## KODAK INDUSTREX LO Fixer and Replenisher

This fixer is recommended to process all types of industrial imaging film in automatic and manual processing cycles.

This fixer consists of a single part liquid—just add water to the proper dilution. For use, the concentrate must be diluted with water according to the instructions provided below (see “Mixing Instructions.”)

### Features:

- Low odor
- Improved archivability
- Reduced environmental impact—lower COD and BOD<sub>5</sub> (5-days Biochemical Oxygen Demand)
- Concentrated (single part) liquid fixer provides ease of use
- Designed for use in both automatic and manual processing
- Can be used in chemical auto-mixers

## Compatibility

KODAK INDUSTREX Single Part Developer Replenisher and KODAK INDUSTREX LO Fixer and Replenisher can be used with all KODAK INDUSTREX Films.

## Storing Solutions

To maintain product quality, these chemicals must be stored in the original package, at a temperature between 5 and 30° C (41 to 86° F). When stored in these conditions, the lifetime is two years from the date of manufacture.

Discard solutions if there is evidence of contamination, dirt, over-dilution, excessive evaporation, or crystallization.

## Mixing Instructions

### KODAK INDUSTREX Single Part Developer Replenisher

KODAK INDUSTREX Single Part Developer Replenisher is supplied in a quantity to prepare 38 litres (2 x 19 litres) or 40 litres (2 x 20 litres) of working solution, depending on geographic region, and consists of plastic containers of concentrated developer solution.

#### Mixing Developer Replenisher

To Make Working Strength Solution	Start with Water at 10 - 30° C (50 - 86° F)	Add Concentrate (Number of Bottles)	Fill to:	Stir
19 L	10 L	1	19 L	Stir for about 2 minutes until a completely homogeneous solution is obtained.
20 L	10 L	1	20 L	

To mix smaller quantities, use the following table and multiply as needed:

To Make 1 Litre Working Strength Developer Solution		
Start with Developer Concentrate	Add Water at 10 - 30° C (50 - 86° F) to Make 1 L	Stir
250 mL	750 mL	Stir for about 2 minutes until a completely homogeneous solution is obtained.

#### Automixer Mixing

Remove bottle caps (leaving seal intact) and place bottle in Automixer template. The Automixer will add water to achieve the proper volume or specific gravity (1.071), depending on the type/model of automixer.

### KODAK INDUSTREX Single Part Developer Starter

KODAK INDUSTREX Single Part Developer Starter is used with KODAK INDUSTREX Single Part Developer Replenisher to prepare a developer working-strength startup solution for automatic processing. The use of starter is not necessary for manual or tank processing.

Add 31 mL of starter solution per 1 litre of mixed INDUSTREX Single Part Developer Replenisher.

## KODAK INDUSTREX LO Fixer and Replenisher

To Make	Start with Water at 10 - 30° C (50 - 86° F)	Add Concentrate (Number of Bottles), Stirring Constantly	Fill to:	Stir
19 L	10 L	1	19 L	Stir continuously for about 2 minutes until a completely homogeneous solution is obtained.
20 L	10 L	1	20 L	

To mix smaller quantities, use the following table and multiply as needed:

To Make 1 Litre Working Strength Fixer Solution			
Starting With Package That Makes	Start with Fixer Concentrate	Add Water at 10 - 30° C (50 - 86° F) to Make 1 L	Stir
19 L	200 mL	800 mL	Stir for about 2 minutes until a completely homogeneous solution is obtained.
20 L	250 mL	750 mL	

#### Automixer Mixing

Remove bottle caps (leaving seal intact) and place bottles in Automixer template. The Automixer will add water to achieve the proper volume or specific gravity (1.066 for 19 L mix, 1.084 for 20 L mix), depending on the type/model of automixer.

#### Safelight Recommendations

Use a red safelight filter (i.e., KODAK 1, 1A, or 2 Safelight Filter) in a suitable safelight lamp equipped with a 15-watt bulb. Keep the film at least 4 feet (1.2 metres) from the safelight.

**Note:** Other safelight filters (i.e., KODAK 8 and GBX-2 Safelight Filter) which block radiation at 550nm and shorter wavelengths are also suitable for use.

## Machine Processing

**Notice:** Observe precautionary information on product labels and on the Material Safety Data Sheets.

Cycle	Time in Minutes	Development Time	Temperature
<b>M35 Processor</b>			
Normal	8.5	104 seconds	28° C (82° F)
Long	10.5	128 seconds	28° C (82° F)
Short	5	60 seconds	32° C (90° F)
<b>M43IC Processor</b>			
Normal	8	100 seconds	26° C (79° F)
Short	5	60 seconds	30° C (86° F)

## Washing and Drying

### Washing:

Follow the processor manufacturer's recommendation for wash flow rate, or adjust flow to achieve the equivalent of the wash tank capacity every five minutes, or twelve tank volumes per hour. Insufficient wash flow can adversely affect the life expectancy of processed radiographs. Wash flow rate should be increased if chemical spot tests or other analytical methods reveal a high level of retained chemicals in the processed film. For best results, the wash tank should be drained daily and left empty when not in use.

### Drying:

Follow the processor manufacturer's recommendation for dryer settings. In general, the dryer should be set to a temperature slightly above (3° C/5° F) the lowest temperature required to eliminate any signs of tackiness in films exiting the dryer.

## Replenishment

The consistency of the radiographic quality is related to the accurate adjustment of the replenishment rate.

Replenishment should maintain the chemical equilibrium, replacing the components used by the film.

Solution	Replenishment Volume	
	per 14 x 17 inch sheet	per m <sup>2</sup>
Developer	100 mL	665 mL
Fixer	180 mL*	1200 mL

\* For optimum archivability, a 10% increase in fixer replenishment rate may be desirable.

## Manual Processing Development

Cycle	Development Time	Temperature	Agitation
Normal	5 minutes	20° C (68° F)	Vigorous for 15 seconds, then intermittent (5 seconds every 30 seconds)
Intermediate	3 minutes	24° C (75° F)	
Short	2 minutes	26° C (79° F)	

## Stop, Fix and Wash Steps

	Temperature	Recommended Time	Agitation
KODAK Indicator Stop Bath, diluted 3.5% acetic acid solution <sup>1</sup> , or running water rinse	60 to 85° F 16 to 30° C	30 seconds	Moderate
KODAK INDUSTREX LO Fixer and Replenisher or KODAK Rapid Fixer	60 to 85° F 16 to 30° C	3 to 6 minutes, or twice the clearing time	Vigorous for 15 seconds, then intermittent (5 seconds every 30 seconds)
Running water wash <sup>2</sup> (8 volume changes per hour)	60 to 85° F 16 to 30° C	10 to 30 minutes	

<sup>1</sup>Stop baths check development, prevent most spots or streaks, and prolong the life of the fixing bath.

<sup>2</sup>KODAK Hypo Clearing Agent may be used to reduce washing time and conserve water. KODAK PHOTO-FLO Solution may be used after washing to minimize water spots and drying marks.

Dry in a dust-free area at room temperature or in a suitable drying cabinet. Temperature not to exceed 120° F (50° C).

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## Replenishment

- Use floating covers on developer tanks to reduce oxidation and evaporation; store developer replenisher in a closed container.
- When removing films from developer tank, DO NOT ALLOW EXCESS SOLUTION TO DRAIN BACK INTO TANK. Normally this will carry out the proper amount of solution to permit correct replenishment.
- Add replenisher at the following rates:

Solution	Replenishment Volume	
	per 14 x 17 inch sheet	per m <sup>2</sup>
Developer	100 mL	665 mL
Fixer	180 mL	1200 mL

- Fill the developer and fixer tank to its original level each morning with developer or fixer replenisher solution (topping off).
- Discard solution after adding two tank volumes of replenisher to tank, or at least once a month, and refill with fresh solution.

NOTICE: While the sensitometric data in this publication are typical of production coatings, they do not represent standards which must be met by Carestream Health, Inc. Varying storage, exposure, and processing conditions will affect results. The company reserves the right to change and improve product characteristics at any time.

## Carestream

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