

Using INDUSTREX Process Control Strips



GENERAL INFORMATION

INDUSTREX Process Control Strips provide a quality control tool for processing systems, in accordance with ASTM E 999 and EN ISO 11699-2 standards.

Product Description

INDUSTREX Process Control Strips are preexposed with a 10-step wedge to X-ray radiation. They come in 6 x 24 cm size, in Ready Pack II packages, 25 per box. Each box is accompanied by a certificate. A control chart is included in each box of Process Control Strips.

(Figure 1 shows the strip after processing.)

Use the control chart accompanying this publication to monitor the quality of your process by plotting your own calculations in comparison to the densities provided on the certificate. Be sure to start a fresh chart each time you open a new box of strips, as the reference values may vary slightly. Your own values can vary a small amount from the reference values. Note trends and act accordingly when values exceed the following guidelines:

- Speed index (Sx): +/- 10%
- Contrast index (Cx): - 10%, +15%

Draw your own tolerance lines as a visual reference so you can act as needed whenever your process strays outside these limits.

Storage Conditions

Ideally, store the control strips in an area properly shielded from penetrating radiation and at a temperature of 10 to 20 °C (50 to 68 °F). Store unopened Ready Pack II pouches at 30 to 50% relative humidity.

Certificate

The certificate that is provided with each box of product contains the following information:

- Film
- Processor
- Chemicals
- Processing Cycle and Temperature
- Brand name and type of preexposed strips
- Reference values for Speed Index (Sr) and Contrast Index (Cr) and the step numbers for calculating the corresponding indices.

Use of Pre-exposed Control Strips

If the customer's processing is in accordance with the certificate:

After processing the strip, the following densities must be measured:

D_0 = Density of step 0 (see Figure 1)

D_x = Density of reference speed step X

D_{x+4} = Density of reference contrast step (X+4)

With these values, the Speed Index Sx will be calculated as follows:

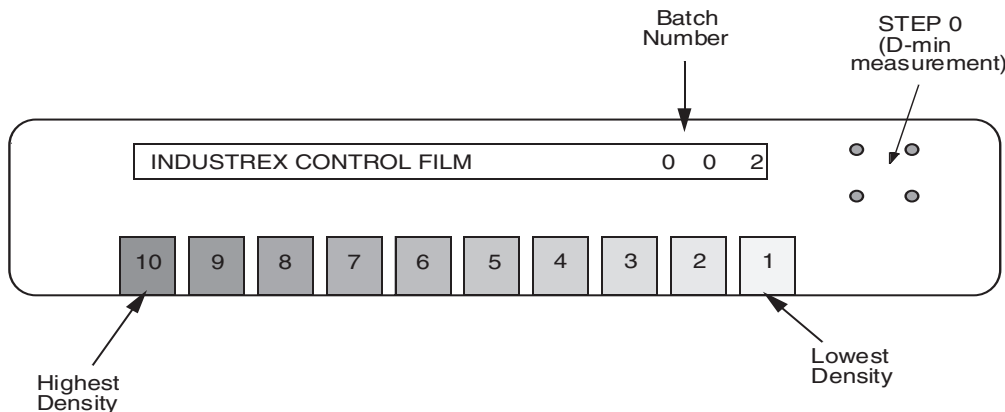
$$S_x = D_x - D_0$$

And the Contrast Index:

$$C_x = (D_{x+4} - D_x) * Sr / S_x$$

Sr is the Reference Speed Index mentioned in the certificate. A trend chart can be established to follow the evolution of the processing system by plotting Sx versus Sr and Cx versus Cr.

Figure 1: INDUSTREX Process Control Strip



Using INDUSTREX Process Control Strips

If the customer's processing is different from the certificate:

In this case the customer will have to determine the reference values of its processing system.

First, load the processor with new chemicals (developer and fixer) in accordance with the manufacturer's recommendations. Then:

1. Process 2 square meters of exposed film at a density between 2.00 and 3.00.
2. Process 5 control strips, and on each of them, measure the density of each step and D-min on Step 0.
3. Average the D-min values from the 5 strips. This is the D0 value.

Next, determine which steps will be used for Dx and Dx+4:

- Step X: the step with a net density (Dx - D0) closest to 2.0.
- Step X+4: the step with a higher density which is 4 steps from X.
- The resulting densities shall have a maximum variance of D= +/-0.10.

The reference values of the processing system are:

Reference Speed Index (Sr): The average value of the net densities of step X, rounded to one decimal.

Reference Contrast Index (Cr): The positive difference of the average net densities of steps X and X+4, rounded to 1 decimal.

For interpretation and checking intervals, refer to EN ISO 11699-2 standard.

IMAGE STABILITY

Less than optimum fixer or washing conditions may cause image deterioration due to a high residual thiosulfate component in the processed radiographs.

To evaluate washing, the following test shall be performed:

CARESTEAM X-Omat Hypo Test Kit (CAT No. 196 5847) provides a relatively simple method for estimating the amount of thiosulfate retained in a processed radiograph. Place one drop of the Hypo Test Solution in a blank area of the recently processed film, for example step 0. Allow the solution to stand for 2 minutes, then blot off the excess solution. Since INDUSTREX Process Control Strips are produced on a double-sided film, repeat this process on the other side of the processed strip, directly opposite the first spot (the estimate is derived from the sum of the two spots). Immediately compare the stain with the density patches on the Hypo Estimator. Follow the instruction sheet provided inside the kit.

The permanence of radiographs can also be affected by storage conditions. Processed radiographs are best stored at 4.4 to 24 °C (40 to 75 °F) and 30 to 60% relative humidity.

INDUSTREX Process Control Strip Plotter Form

Control Strips box	
Batch N°	

Processor	
Type	

	Name	Temperature	Replenishment
Developer			
Fixer			

Date of test																					
Fresh Dev/Repl																					
Fresh Fix/Repl																					
Base + Fog (D0)	0.30																				
	0.25																				
	0.20																				
	0.15																				
Speed Index (Sx)	+0.30																				
	+0.20																				
	+0.10																				
	Sr= <input style="width: 40px;" type="text"/>																				
	-0.10																				
	-0.20																				
Step X	-0.30																				
<input style="width: 40px;" type="text"/>																					
Contrast Index (Cx)	+0.30																				
	+0.20																				
	+0.10																				
	Cr= <input style="width: 40px;" type="text"/>																				
	-0.10																				
	-0.20																				
Step X+4	-0.30																				
<input style="width: 40px;" type="text"/>																					

D0 = measured D-min

$Sx = Dx - D0$

$Cx = (Dx+4 - Dx) * \frac{Sr}{Sx}$

Sr = Reference speed index from certificate

Cr = Reference contrast index from certificate

**INDUSTREX PROCESS CONTROL STRIPS
BATCH N° 289**

CERTIFICATE

(in accordance with EN ISO 11699–2 standard)

Automatic Processing

Immersion time: 100 sec +/- 5 sec
 Developer: INDUSTREX SINGLE PART
 Developer temperature: 26 °C

Film Type	Reference Speed index	Step X	Reference Contrast index	Step X + 4
INDUSTREX MX 125	Sr 2,02	4	Cr 1,13	8

Manual Processing

Immersion time: 300 sec +/- 5 sec
 Developer: INDUSTREX SINGLE PART
 Developer temperature: 20 °C

Film Type	Reference Speed index	Step X	Reference Contrast index	Step X + 4
INDUSTREX MX 125	Sr 2,02	4	Cr 1,13	8