Developing Large Format Film

Developing large format film follows the same basic procedures and steps as processing roll film, except the way the film is handled. There are three basic ways of developing and processing large format film, including the use of trays, film-processing tanks with film hangers and the use of a rotary machine processor. With both the tray and tank techniques, the film is transferred from one chemical to each successive chemical in processing procedure, whereas, the machine processor functions similar to a roll film developing tank with each successive chemical poured in/out of the tank.

Equipment Necessary to Develop Large Format Film

- Processing Trays and Film Basket
- Large format Processing Tanks and Film Hangers
- Rotary machine processor
Polyester or Polypropylene Negative Archival Flip-top Storage Box
Enclosures and Archival Envelopes

Safety Considerations

Photographic chemicals should be handled with reasonable care. The goal is to avoid getting chemicals onto and/or into your body.

If at any point, you get chemicals on you, into your body or there is a chemical spill, it is important to take of the incident immediately, including washing the chemical off, and letting the instructor and/or lab instructor know to assist immediately for the safety of yourself and others in the lab.

Avoid Skin Contact

If you do get chemicals on your skin, wash immediately. Replace skin oils with a good hand lotion.

Avoid Getting Chemicals Into Eyes

If you do get chemicals in your eye, wash immediately with cool running water from the nearest source, faucet or eyewash station for 15 minutes. Get immediate medical attention after washing eye.

Avoid Getting Chemicals Into Mouth

Per the Photography Department Lab rules; there are no food or drinks allowed in the film processing rooms and darkrooms. Wash hands after working with chemicals in both the film processing rooms and darkrooms, especially before eating.

Avoid Inhaling Chemicals

The Photography Department Lab has ventilation in both the film processing rooms and darkrooms to insure fresh airflow. Particle masks are available for you to use.

Clean Up Chemical Spills

If a spill occurs it is important to contain the spill and notify the instructor and/or lab technician immediately to determine how the spill should be cleaned up. Clean your clothing and shoes if they come into contact with the chemical.

Dispose of Chemicals Properly

With the exception of the fixer, it is environmentally safe to dispose the film developing chemistry down the sink. Per federal, state and local environmental regulations, you are required to dispose of the fixer in the provided recycling container.
Tray Processing

Preparing to Work

Secure film developing room and set-up four (4) 8” x 10” trays.

The developer tray should be set-up in an 11” x 14” tray.

Use stainless steel baskets to process 4 sheets simultaneously.

The trays should be set-up in the following sequence:

- Pre-Wash
- Developer
- Water Rinse
- Fixer

Chemistry Preparation

- **Pre-Wash** 34 oz. – tap water to be filled in film processing room.
- **Film Developer** 34 oz. – use straight developer with no dilution.
- **Water Rinse** 34 oz. – tap water to be filled in film processing room.
- **Fixer** 34 oz.
**Agitation Process**

Gently agitate the ends and sides of the tray. One method is to lift each corner of the tray in 5-second intervals. When agitating the developer tray, lift the corners of the 11” x 14” tray to avoid over-developed film edges. Repeat the process for the specified amount for each step.

When moving the stainless steel basket from each tray, grab the center and drain for 10 seconds by the basket over the exiting tray at a slight upright angle so fluids drain from one corner back into the tray. Proceed to place basket in next tray.

**Development Guide**

All solutions at 68º F - 72º F with developer at 70º, + or - ½ degree

All processing is done in the dark

*Target development times/temperatures | D-76 Straight

<table>
<thead>
<tr>
<th></th>
<th>68º</th>
<th>70º</th>
<th>72º</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRI-X / HP-5</td>
<td>6.5</td>
<td>6</td>
<td>5.5</td>
</tr>
<tr>
<td>HP-5</td>
<td>7.5</td>
<td>7</td>
<td>6.5</td>
</tr>
</tbody>
</table>

**Pre-Wash**

*Tap Water*  
1 minute  
Constant agitation. Discard solution after use.

**Developer**

*D-76 Straight*  
6 – 7.5 minutes*  
Constant agitation. Discard solution after use.

**Water Rinse**

1 minute  
Constant agitation. Discard solution after use.

**Fixer**

*Nacco Nu-Fix*  
5 minutes  
Constant agitation. **Recycle fixer into recycling container at end of hall by door** - **Do Not Discard Down Drain.**

**Wash**

*Tap Water*  
5 minutes  
Use film washer at 68º F - 72º F. Colder temperatures inhibit washing, while warmer temperatures will soften the film emulsion.

**Wetting Agent**

*Edwal LFN*  
1 minute  
Prepare in wetting agent tray.  
4 drops of LFN per 34 oz. of water.  
Constant agitation. Discard solution after use.

**Drying**

20 minutes  
Hang film in film dryer at the notched corner and catch drips with Kim Wipe.

**Clean-Up**

As film is drying, wash and dry all graduates, trays and stainless steel basket for next person to use.

**Sleeve Film**

Once the film is done drying, turn dryer off, remove film, and sleeve in negative sleeve. Turn the dryer back on if there are still sheets of film drying.
Tank / Film Hanger Processing

Preparing to Work

Secure film developing room and set-up four (4) processing tanks.

Use film hangers to process up to 6 sheets simultaneously.

The processing tanks should be set-up in the following sequence:

- Pre-Wash
- Developer
- Water Rinse
- Fixer

Chemistry Preparation

- **Pre-Wash**: 50 oz. – tap water to be filled in film processing room.
- **Film Developer**: 50 oz. – use straight developer with no dilution.
- **Water Rinse**: 50 oz. – tap water to be filled in film processing room.
- **Fixer**: 50 oz.
**Agitation Process**

Slowly lift hangers out of film processing tank, and tilt hangers 45° for a few seconds to drain before returning them slowly into the tank. Repeat the process for a total of 15 seconds per minute for each step.

**Development Guide**

All solutions at 68° F - 72° F with developer at 70°, + or - ½ degree

All processing is done in the dark

*Target development times/temperatures | TRI-X @ EI 160 | HP-5 @ EI 200

<table>
<thead>
<tr>
<th>Temperature</th>
<th>66°</th>
<th>68°</th>
<th>70°</th>
<th>72°</th>
<th>75°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Time</td>
<td>11.5</td>
<td>11</td>
<td>10.5</td>
<td>10</td>
<td>9</td>
</tr>
</tbody>
</table>

**Pre-Wash**

*Tap Water*

1 minute **Constant agitation. Discard solution after use.**

**Developer**

*D-76 1:1*

*See Chart* D-76 1:1 **Constant agitation. Discard solution after use.**

**Water Rinse**

1 minute **Constant agitation. Discard solution after use.**

**Fixer**

5 minutes **Constant agitation. Recycle fixer into recycling container at end of hall by door - Do Not Discard Down Drain.**

**Wash**

*Tap Water*

5 minutes **Use film washer at 68° F - 72° F. Colder temperatures inhibit washing, while warmer temperatures will soften the film emulsion.**

**Wetting Agent**

1 minute **Prepare in wetting agent tray. 4 drops of LFN per 50 oz. of water. Constant agitation. Discard solution after use.**

**Drying**

20 minutes **Hang film in film dryer at the notched corner and catch drips with Kim Wipe.**

**Clean-Up**

As film is drying, wash and dry all graduates, tanks and film hangers for next person to use.

**Sleeve Film**

Once the film is done drying, turn dryer off, remove film, and sleeve in negative sleeve. Turn the dryer back on if there are still sheets of film drying.
Jobo Rotary Machine Processor

Preparing to Work

Secure Jobo Machine Processor and processing drum.

In the dark, load film into processing drum. The drum can process up to 10 sheets simultaneously.

Chemistry Preparation

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Wash</td>
<td>34 oz.</td>
</tr>
<tr>
<td>Film Developer</td>
<td>34 oz.</td>
</tr>
<tr>
<td>Water Rinse</td>
<td>34 oz.</td>
</tr>
<tr>
<td>Fixer</td>
<td>34 oz.</td>
</tr>
</tbody>
</table>

Jobo Processor Operation

Turn processor on

Turn motor on

F (Jobo Processor #1)

6 (Jobo Processor #2)
Development Guide

All solutions at 68° F - 72° F with developer at 70°, + or - ½ degree

Target development times/temperatures for Tri-X @ EI 160 / HP5 @ EI 200

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Tri-X</th>
<th>HP5</th>
</tr>
</thead>
<tbody>
<tr>
<td>68°</td>
<td>6.5</td>
<td>6</td>
</tr>
<tr>
<td>70°</td>
<td>6</td>
<td>5.5</td>
</tr>
<tr>
<td>72°</td>
<td>5.5</td>
<td></td>
</tr>
</tbody>
</table>

Pre-Wash

Tap Water

Pour pre-wash in the lift funnel quickly. Discard solution during last 10 seconds by lifting drum. Be sure to assist the lift by using your right hand under the end of the drum support.

Developer

D-76 Straight

Pour developer in the lift funnel quickly. Discard solution during last 10 seconds by lifting drum. Be sure to assist the lift by using your right hand under the end of the drum support.

Water Rinse

Pour water rinse in the lift funnel quickly. Discard solution during last 10 seconds by lifting drum. Be sure to assist the lift by using your right hand under the end of the drum support.

Fixer

Nacco Nu-Fix

Pour fixer in the lift funnel quickly. Discard solution during last 10 seconds by lifting drum in graduate. Be sure to assist the lift by using your right hand under the end of the drum support. Recycle fixer into recycling container at end of hall by door - Do Not Discard Down Drain.

Wash

Tap Water

Pour water rinse in the lift funnel quickly. Discard solution every minute by lifting drum and refilling drum. Repeat process for total time. Be sure to assist the lift by using your right hand under the end of the drum support to drain.

Turn off Jobo Machine Processor and remove drum. Remove top of drum with the pump. Remove film to a tray to carry to wetting agent.

Wetting Agent

Edwal LFN

Prepare in wetting agent tray. 4 drops of LFN per 34 oz. of water. Constant agitation. Discard solution after use.

Drying

20 minutes

Hang film in film dryer at the notched corner and catch drips with Kim Wipe.

Clean-Up

As film is drying, wash and dry all graduates and drum for next person to use.

Sleeve Film

Once the film is done drying, turn dryer off, remove film, and sleeve in negative sleeve. Turn the dryer back on if there are still sheets of film drying.