PHOTOLAB CHEAT SHEET

Film formats & speed

135: 36 × 24 mm (= FX), 24 or 36 exposures (ISO 1007). **120** (Fujifilm): 6 × 4.5 cm: 16 · 6 × 6: 12 · 6 × 7: 10 · 6 × 9: 8 pictures.

ISO 6 (b/w neg.), ISO 5800 (colour neg.). FP4 PLUS ISO 125/22°, HP5 PLUS 400/27°. **+3° = one stop**: 400/27 · 800/30 · 1600/33 · 3200/36.

B&W film: the steps (20 °C, tank)

STEP	ILFORD (HP5 PLUS)	KODAK
1 develop	ID-11 undiluted 7½ min	TRI-X, D-76: 6¾ min
2 stop	ILFOSTOP 1+19, 10 s	30 s
3 fix	RAPID FIXER 1+4, 2–5 min	Rapid Fixer 2–4 min
4 wash	5–10 min running (within 5 °C)	20–30 min running
5 wetting	ILFOTOL 1+200, dry dust-free	PHOTO-FLO 30 s

Alternatives – Ilford (water-saving): fill, invert 5×, drain; again 10×; again 20×. Kodak: rinse 30 s, Hypo Clearing Agent 1–2 min, wash 5 min.

Agitation, temperature, dilution

- **Ilford:** 4 inversions in the first 10 s, then 4 in the first 10 s of every minute; continuous agitation: times up to 15 % shorter.
- **Kodak:** 5–7 inversions in 5 s, every 30 s. D-76 (J-78): 5 s every 30 s, 2–5 cycles “depending on the contrast you need and the type of tank”.
- Use the agitation from the same sheet as the time.

Warmer = faster. Ilford: 6 min at 20 °C ⟶ 4½ min at 23 °C, 9 min at 16 °C. Kodak, TRI-X 400 in D-76:

18 °C	20 °C	21 °C	22 °C	24 °C
8 min	6¾ min	6¼ min	5½ min	4¾ min

Diluted = longer: HP5 PLUS in ID-11 7½ min undiluted, 13 min at 1+1. D-76 1:1: more sharpness, slightly more grain – dilute just before use, then discard.

Push & pull (20 °C)

FILM / DEVELOPER	EI	MIN
HP5 PLUS, DD-X 1+4	400 · 800 · 1600 · 3200	9 · 10 · 13 · 20
HP5 PLUS, D-76 undil. (Ilford)	400 · 800 · 1600	7½ · 9½ · 12½
TRI-X 400, D-76 (Kodak)	400 · 1600 · 3200	6¾ · 9½ · 11
FP4 PLUS, ID-11 undil.	50 · 125 · 200	6½ · 8½ · 10

Push = higher EI + longer, pull = lower + shorter. Kodak: more contrast and grain, lost shadow detail. Ilford’s EI range: practical tests, not ISO 6. **Starting points** – Kodak aims at contrast index 0.56: test.

Colour negative: C-41 (Kodak Z-131)

DEV.	BLEACH	WASH	FIX	WASH	STAB.
3:15	6:30	3:15	6:30	3:15	1:30

Developer at **37.8 ± 0.15 °C** – even small differences have a significant effect; the other baths 24–41 °C.

Safelight

Ilford SL1 / 902, **15 W**, or Kodak OC, **15 W** direct – at least **1.2 m** away; Ilford papers should be safe up to 4 min. Test: pale grey sheet (total darkness), strips under the safelight – Kodak: the coin test can mislead.

	ILFORD	KODAK
grey (density)	≈ 0.2–0.3	0.25–0.50
steps	0 · 1 · 2 · 4 min	0 · 1 · 3 · 7 min
safe if	no change 0 ⟶ 4 min	no extra density

Enlarger, test strip, contrast

- Focus wide open, then stop down to about **f/8**; MULTIGRADE filter 2 for an average negative.
- Test strip: 2 s all, +2, +4, +8 s ⟶ **2 · 4 · 8 · 16 s** (one stop apart). All too light: open two stops; all too dark: close one stop.
- MULTIGRADE: 12 filters, 00–5 in half steps; white light ≈ grade 2. Grey, no real blacks ⟶ 3 or higher; harsh ⟶ 1. 00–3½ about the same exposure, 4–5 more (Ilford’s sheets: one stop / 0.5–1 / “increased”) – new test strip.
- Dodging ⟶ lighter · burning ⟶ darker.

Paper processing (Ilford, 20 °C)

- **RC:** MULTIGRADE developer 1+9 1 min · ILFOSTOP 1+19 10 s · RAPID FIXER 1+4 30 s (1+9: 1 min) · wash 2 min, running, above 5 °C. Wet max. 15 min.
- **Fibre (FB):** fix 1 min at 1+4 (2 min at 1+9) · wash 60 min – or 5 min, WASHAID 1+4 10 min (18–24 °C), 5 min. Two-bath fixing; silver below 2 g/l; sulphide spot test yellow = not properly fixed.

Ilford’s beginner sheet is inconsistent: its text says develop 50 s and stop ≈ 30 s (its table: 1 min, 10 s).

Storage

Library of Congress: 30–50 % RH, 70 °F (21 °C) or below, swings under 5 % in 24 h; colour photos and film negatives 40 °F (4 °C) or below; enclosures ISO 18902 + PAT. Acetate (vinegar syndrome): fresh film at 21 °C / 50 % RH decays measurably after ≈ 40 years (IPI).

Scanning: resolution

`pixels = size in mm ÷ 25.4 × ppi`

Enlarging later: raise the scan resolution by the enlargement factor – 35 mm printed 36 cm wide = 10× ⟶ 10 × 300 = 3000 ppi. Output: Epson 300 dpi print, 96–150 screen; Adobe 180–480 ppi inkjet.

35 MM FRAME	PIXELS	MEGAPIXELS
2400 ppi	3402 × 2268	7.7
3000 ppi	4252 × 2835	12.1
4000 ppi	5669 × 3780	21.4
6400 ppi	9071 × 6047	54.9

Scanning: dust, colour negatives, archive

- **DIGITAL ICE** (infrared): colour negatives, colour slides except Kodachrome, chromogenic b/w – not recommended for conventional b/w or Kodachrome (⟶ “Dust Removal”). May look softer; not on clean originals (Epson).
- **Orange mask** = unreacted couplers (IPI). **negadoctor** (darktable): unexposed film edge in the scan; filmic rgb / base curve off; film base (D min) ⟶ D max (white) ⟶ scan exposure bias (black) ⟶ corrections ⟶ print.
- **FADGI:** document, don’t restore – clean only derivatives (an ICE master is already retouched). Masters lossless (TIFF v6; LZW, JPEG 2000 approved); sharpen sparingly. Camera raws: DNG (ISO 12234-4 since 03/2026).

Sources: Ilford HP5 PLUS, FP4 PLUS, MULTIGRADE, RAPID FIXER, safelight & first-print sheets · Kodak F-4017, J-78, Z-131, K-4 · Fujifilm · ISO 6, 5800, 1007, 18902 · Library of Congress · IPI · Epson · darktable 5.6 · FADGI (2023) · Adobe. Details: adubta-music.de/fotolabor.html

Checked 11.10.2026 – no AI sources.