

1 INK & DAMPENING MAINTENANCE

	Daily	Weekly	months				Slow	Stop	Safety	Quality
			1	3	6	12				
1 Ink supply (pump and piping)			✓				●			Ⓚ
2 Ink supply (pump line filters)		✓			✓					Ⓚ
3 Dampening fountain unit	✓									Ⓚ
4 Clean dampening system, change filters		✓					●	Ⓜ		Ⓚ
5 Refresh dampening water		✓	✓						Ⓜ	Ⓚ
6 Annual system overhaul				✓			●	Ⓜ	Ⓜ	Ⓚ

● Frequency Ⓜ Related problems: ● Slow running, Ⓜ Machine stop, Ⓚ Safety, Ⓚ Poor quality.
This is a generic example only. Refer to suppliers recommended procedures and time intervals.

1-2 Ink supply: Check pumps and lines each month for leaks and malfunctions. Clean and inspect all filters every six months to avoid a build-up that could break through the filter and feed through to the ink duct.

3 Dampening system: Incoming water should have a stable pH and constant conductivity suitable for printing. The dampening solution requires additives to stabilise water pH value to ensure good printing, control plate corrosion, prevent roller stripping and blanket piling, improve surface tension properties and reduce IPA alcohol content. Buffer systems additives inhibit equipment corrosion, control bacteria growth and alkaline impurities from papers and other contaminants. Conductivity measures the quantity of fountain solution additive.

4 Cleaning:
Daily Check temperature, conductivity, pH value and alcohol content.
Weekly Solution tanks and pans for optimum water receptivity.
• Drain system pans, lines and tanks. Refill with hot water.
• Add prepared fountain system cleaner, and pump into pans to circulate.
• Maintain flow of cleaning solution through system until only discoloration of the solution is visible, and no large particles are left.
• After system is clean, drain, flush with clean water, drain, and wipe out pans and tanks.
• Change all filters before refilling with fountain solution.
• Before fountain solution is pumped into pans clean all damper rollers and etched chrome rollers.
• Desensitise roller surfaces by cleaning and etching them (rubber, chrome and ceramic rollers).

5 Refresh dampening water:
Each 2 weeks for alcohol-free solutions;
Each 4 weeks for IPA alcohol solutions.

6 Annual maintenance:
1) Empty the dampening system and remove all filters.
2) Sufficiently fill the reservoir with cleaning solution to ensure a smooth circulation.
3) Circulate 2 to 3 hours. (Turn off freezer unit and run warm whilst cleaning).
4) Empty the reservoir and rinse with water for at least 10 minutes.
5) Re-empty the reservoir and rinse with water and 2.5% of fountain additive.
6) Empty the reservoir and re-fill with dampening water, ready for use.



Dampening system monitoring tools include digital conductivity meter, pH meter and probe thermometer (digital devices are more accurate and easier to calibrate). Photo Sun Chemical.

- Ensure the right combination of ink and fountain solution to match the press, papers, IPA alcohol level and water quality at each plant.
- Rigorous preventative maintenance of the dampening system and its chemistry.



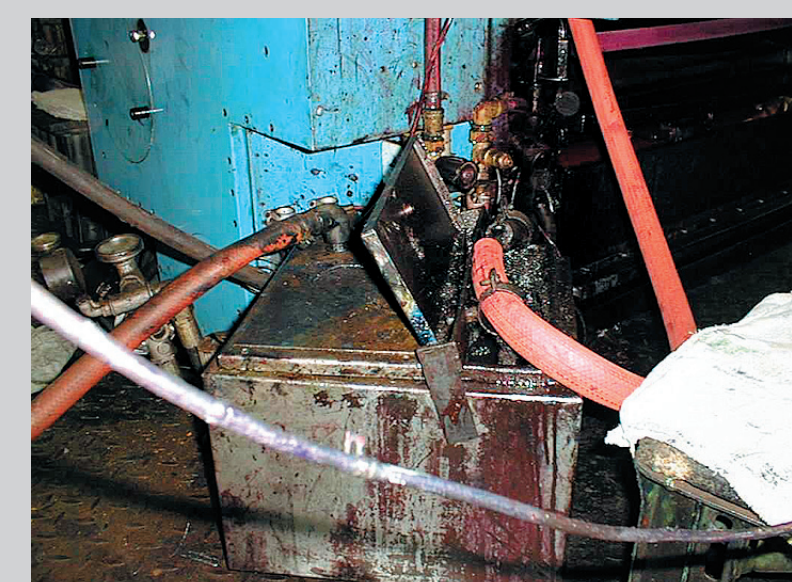
Dirt build-up on the alcohol stabiliser float adds to its weight and can change the alcohol content in the dampening solution. Photo Technotrans.



Corrosion of mechanical parts from using incorrect or aggressive additive or low quality alcohol. Photo Technotrans.



An inline ejector nozzle contaminated with ink from either using the wrong filter element or poor maintenance. Photo Technotrans.



Overflow of a poorly maintained intermediate tank. Photo Technotrans.



Reliable production requires good maintenance and a clean environment.

2 RUBBER ROLLERS MAINTENANCE

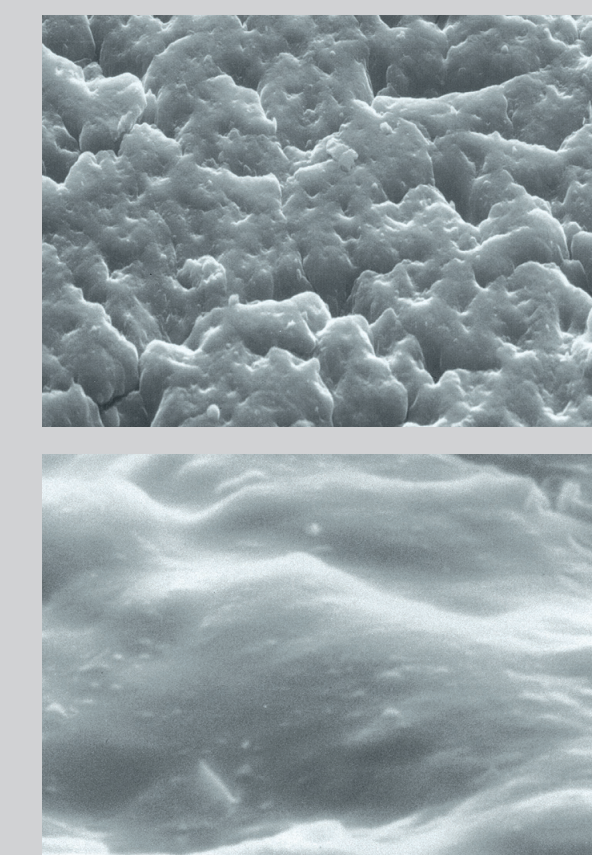
Inking and damping rollers	Daily	Weekly	months				Slow	Stop	Safety	Quality
			1	3	6	12				
1 Hardness and visual surface check					✓					Ⓚ
2 Roller setting check					✓					Ⓚ
3 Roller cleaning	✓									Ⓚ
4 Roller decalcifying		✓								Ⓚ
5 Roller deep cleaning		✓								Ⓚ
6 Bearing check					✓				Ⓜ	Ⓚ
7 Bearing replacement and seat check									Ⓜ	Ⓚ

● Frequency Ⓜ Related problems: ● Slow running, Ⓜ Machine stop, Ⓚ Safety, Ⓚ Poor quality.
This is a generic example only. Refer to suppliers recommended procedures and time intervals.

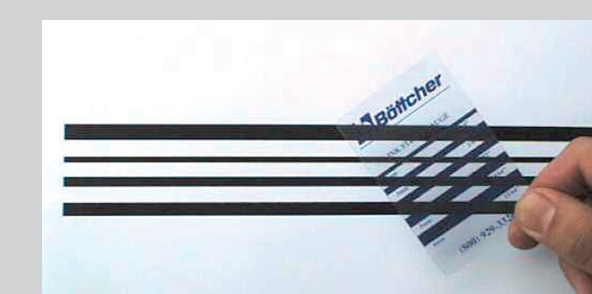
Only the correct selection, setting, cleaning and care of rollers will provide printing quality, productivity and long life.

- 1 Hardness and visual check:** Check the durometer (hardness) of a roller regularly in relation to the type and sensitivity of the application (every 1-8 weeks).
- 2 Roller setting check:** Always ensure the stripe is parallel across the width of the press. Rollers that are too tight, or have excessive hardness, may cause plate cracking.
- 3 Daily roller cleaning:** Use a compatible solvent. Deposits of paper fibres, dust (lint), fillers and hard kaolin clay (from coated stock) are best removed with water.
- 4 Roller decalcifying:** Regularly remove harder deposits (such as calcium carbonate) with a special decalcifying agent.
- 5 Roller deep cleaning:** Consult your roller manufacturer before using "deep-cleaning" products to ensure there are no negative long-term effects on the rubber (swell or shrinkage).
- 6 Bearing check:** Spin bearing by hand and listen and feel for rough spots. Rock bearing from side to side and compare movement with a new one. A bearing that fits well should not move on the shaft.
- 7 Bearing replacement and seat check:** Use only the right parts that are correctly assembled. Bearings of inferior quality can run warm and seize up on press, causing considerable damage. Worn bearings and shafts will not run smoothly and can lead to excessive vibration, which may show up as stripes in the print copy.

Roller swelling and shrinkage: Caused by chemical incompatibility of roller rubber with ink, fountain additives and solvents that change the roller dimensions.
• **Swelling:** Ink form rollers squeeze more water off the plate, causing the plate to pick up more ink and scum in non-image areas.
• **Shrinkage:** A gradual and continuous loss of transfer pressure and quality making it difficult to maintain ink-water balance. Shrinkage over a long period often develops a "flare" on the outer edges.



Clean and glazed roller surfaces viewed under a microscope. Photo Böttcher.

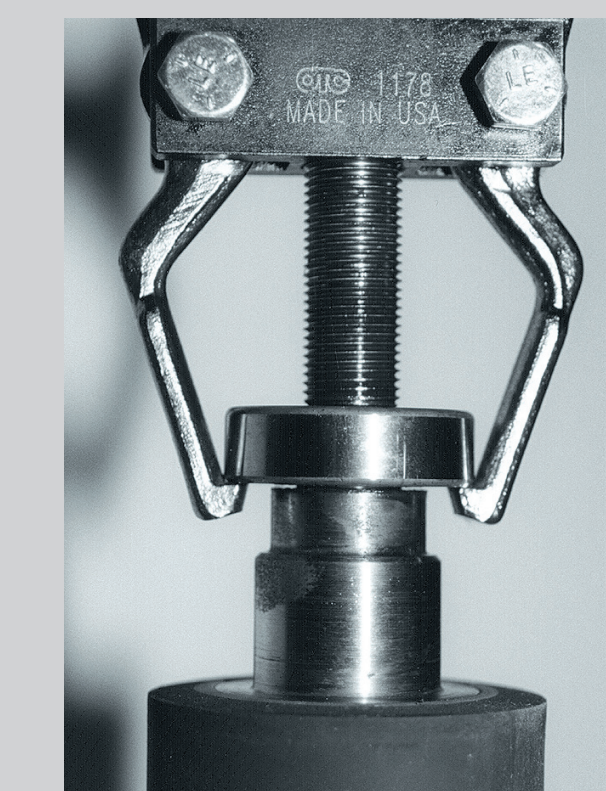


Always ensure the stripe is parallel across the width of the press and check settings using a card with pre-printed roller stripes. Photo Böttcher.

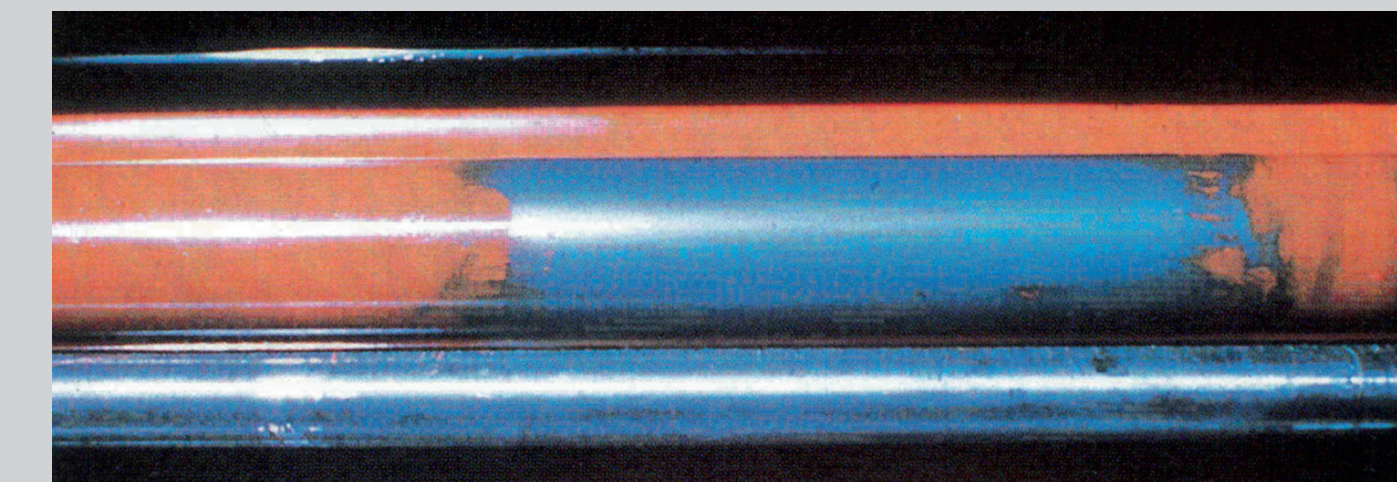
Use only a hardness measuring instrument conforming to DIN EN ISO 8688. To ensure an accurate reading requires the gauge to be held vertically and the reading made after waiting 3 seconds. Photo Böttcher.



Roller damaged due to uneven setting that has significantly increased running temperature. Photo Böttcher.

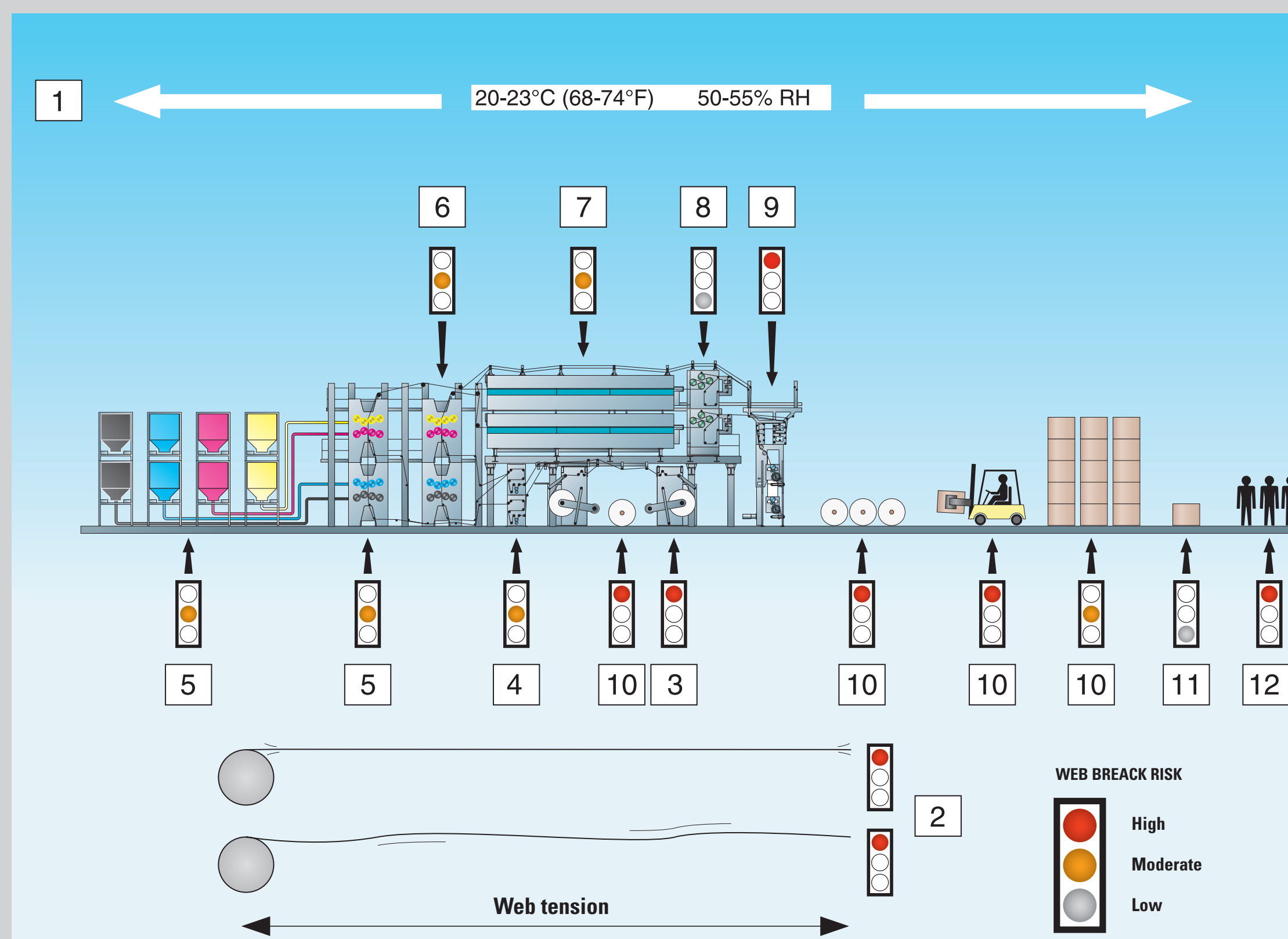


Always use the right tools to ensure a snug and straight fit of bearings. Photo Böttcher.



Rollers that are not cleaned correctly become glazed and hardened. Photo Böttcher.

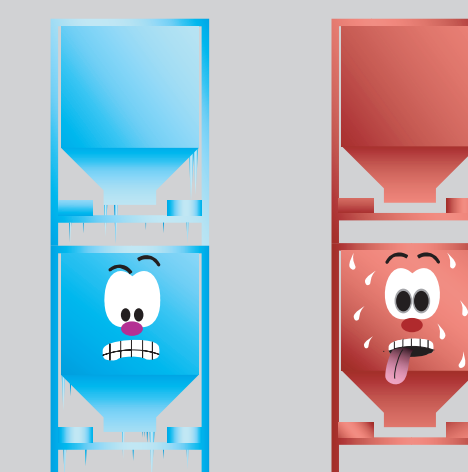
3 TEMPERATURE



- Cold ink has high viscosity causing excessive web breaks, linting and piling.
- Cold ink puts strain on pumping systems and flows poorly in the duct leading to ink starvation.
- Warm ink has low viscosity, it will mist and drip in the press.



Best practice is to systematically monitor temperatures with an infra-red heat gun whilst the press is running. If press performance deteriorates then re-measure all temperatures to isolate the problem source.



- Ink temperature below 18°C (64°F) raises ink viscosity which increases web breaks.
- Warm ink creates ink mist and drips leading to web breaks.

Recommended temperatures

Recommended temperatures for heatset printing

Fountain pans	12-16°C	54-61°F
Inkers	26-34°C	79-93°F
Plates	28-35°C	82-95°F
Blankets	28-35°C	82-95°F

Water cooled ink vibrators

- 26°C (79°F) ± 12% recommended surface temperature.
- > 30°C (86°F) = increased ink tack caused by faster solvent evaporation, risk of ink mist or fly.
- < 26°C (79°F) = increased ink viscosity and reduced ink transfer. May also cause emulsification in high humidity conditions.

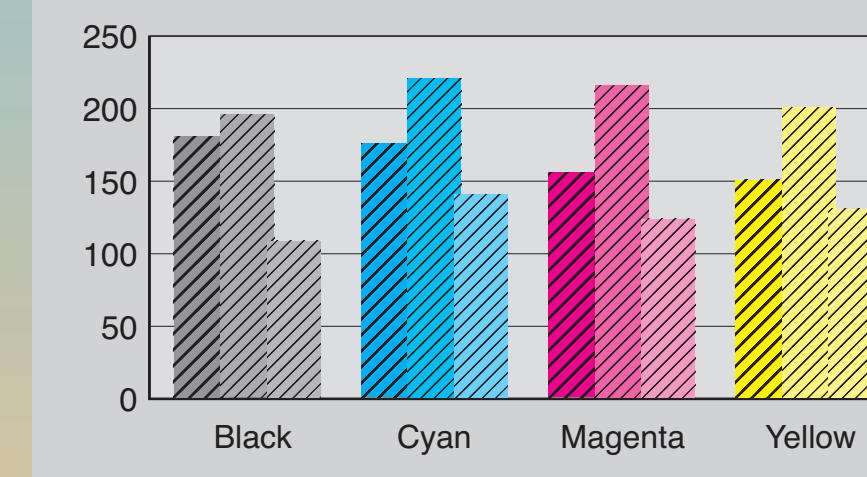
Fountain solution pan

- 12-16°C (54-61°F) set the recirculating tank to low temperatures to achieve these readings.
- > 12°C (54°F) Higher temperatures increase evaporation (also contributes to TVI / dot gain).
- > 10°C (50°F) Lower temperatures reduce ink transfer from the plate.

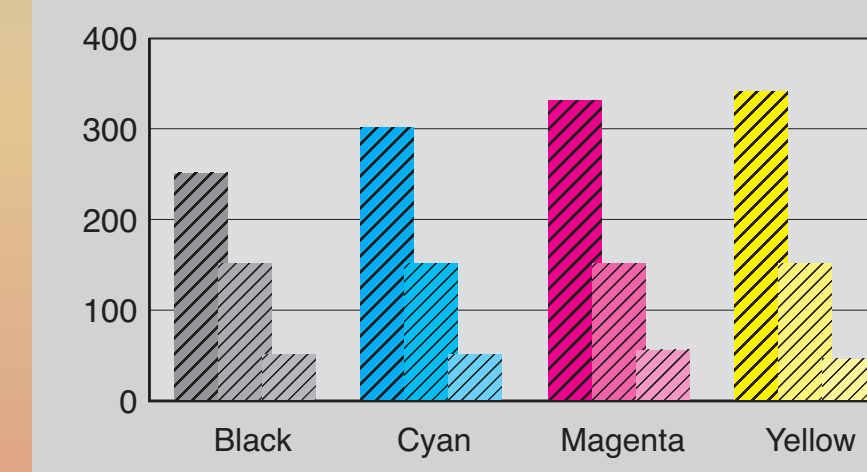
Ink storage

Ink matches the temperature of its environment, because it is a poor heat conductor, it will heat up or cool down slowly.

- Maintain silo temperature at 25°C (77°F) ± 20%.
- Ensure ink supplied to press is not below 20°C (68°F).
- Keep silos out of direct sunlight.
- Ensure correct ink and dampening system temperatures on press.



Temperature impact on ink tack (Tack-o-scope values). Tack peak of ink on machine is 30°C (86°F).



Temperature impact on ink viscosity (viscosity dPa).

18°C / 64°F 30°C / 86°F 38°C / 100°F