TEMPERATURE COMPENSATION TECHNOLOGY

for Computer-to-Plate Devices

Thermal computer-to-plate (CTP) devices from Kodak are extremely accurate and repeatable. To automatically ensure that these very tight specifications remain true throughout the entire environment operating range of the machine, Kodak's CTP devices are equipped with a temperature compensation system.

Temperature compensation technology is crucial for CTP devices to ensure consistent and high-quality plate imaging, regardless of environmental temperature fluctuations. This technology typically involves using high-accuracy temperature sensors, such as platinum resistance temperature detectors (RTDs), to monitor and adjust the temperature during the plate-making process.

For instance, Kodak's CTP systems, like the TRENDSETTER Q800 Platesetter, incorporate advanced temperature compensation to maintain precise imaging quality. This helps reduce prepress errors and ensures consistent output even under varying conditions.

The effects of temperature variation during plate making

Temperature can significantly impact plate imaging in CTP devices in several ways:

1. **Thermal Expansion and Contraction:** Plates can expand or contract with temperature changes, leading to misalignment and inaccuracies in the imaging process. This can result in distorted images or registration errors.
2. **Chemical Reactions:** The photopolymer or thermal-sensitive coatings on plates are affected by temperature. Higher temperatures can accelerate chemical reactions, potentially leading to overexposure, while lower temperatures can slow down these reactions, causing underexposure.
3. **Equipment Performance:** The performance of lasers and other imaging components can vary with temperature. For instance, lasers might produce different energy outputs at different temperatures, affecting the consistency and quality of the image.
4. **Humidity Control:** Temperature fluctuations can also affect humidity levels, which in turn can impact the plate material and the imaging process. High humidity can cause plates to absorb moisture, leading to swelling and image distortion.

Aluminum, like all materials, expands and shrinks with changes in temperature. In fact, a 1-meter wide aluminum printing plate will stretch by more than 0.127 mm (about one row of dots at 175 lpi) if the room temperature increases by a mere 5.6°C (10°F). Therefore, plates, especially remakes, made at different times of the day under typical shop conditions can end up being different sizes when they are imaged, leading to subsequent on-press registration and color shift problems.

The benefits of accurate registration and fit can be lost by the simple act of exposing plates at different temperatures as the platesetter temperature or ambient temperature rises or falls over the course of a day.

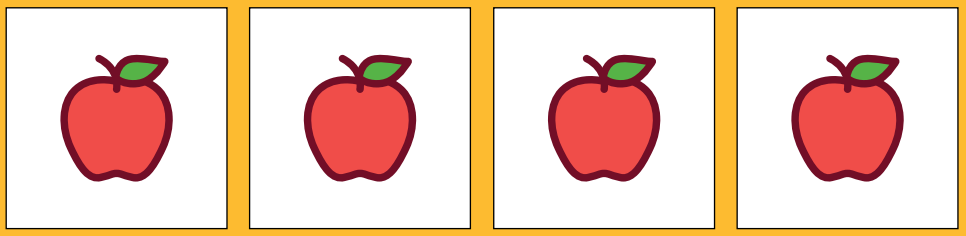
Temperature compensation is not the only factor impacting on-press registration. Strict process control during the plate making process is critical to ensure adequate on-press registration.

THE SOLUTION: TEMPERATURE COMPENSATION TECHNOLOGY

To eliminate the impact of this problem, Kodak has designed a unique temperature compensation technology that adjusts the plate image size to compensate for temperature variation and thus maintain on-press fit and register. The image size accuracy between plates made on the same machine or different machines is +/- 20 microns (.020mm). For example, a plate imaged at 20°C (68°F) at one location and another at 30°C (86°F) on a different machine will register within 1/5 of a row of dots at 250 lpi - eliminating any noticeable impact to color balance or register on press.

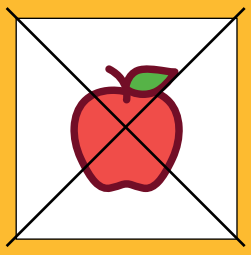
A REAL-WORLD EXAMPLE

Suppose four typical 8-page CMYK plates are exposed during a morning shift at a room temperature of 22°C (72°F).



C **M** **Y** **K**

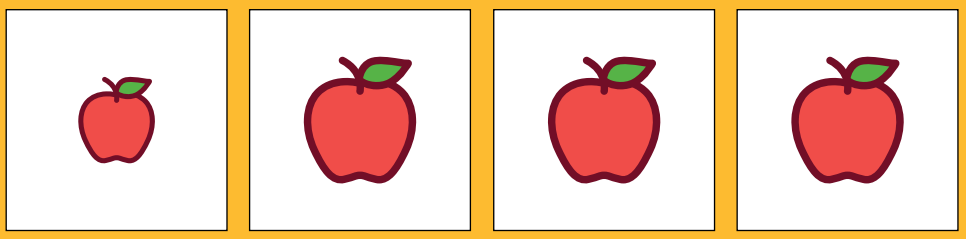
During the late afternoon one plate is damaged and needs to be re-imaged.



Damaged **C**

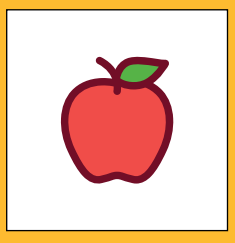
If the ambient temperature has increased over the course of the day to 28°C (82°F), then the first plates and the images on them will have grown by 0.127 mm per meter.

If the new plate is imaged without temperature compensation, the plate will have grown but the image size will remain constant and will be smaller relative to those on the old plates. The new plate image will therefore not fit on press.



New **C** **M** **Y** **K**

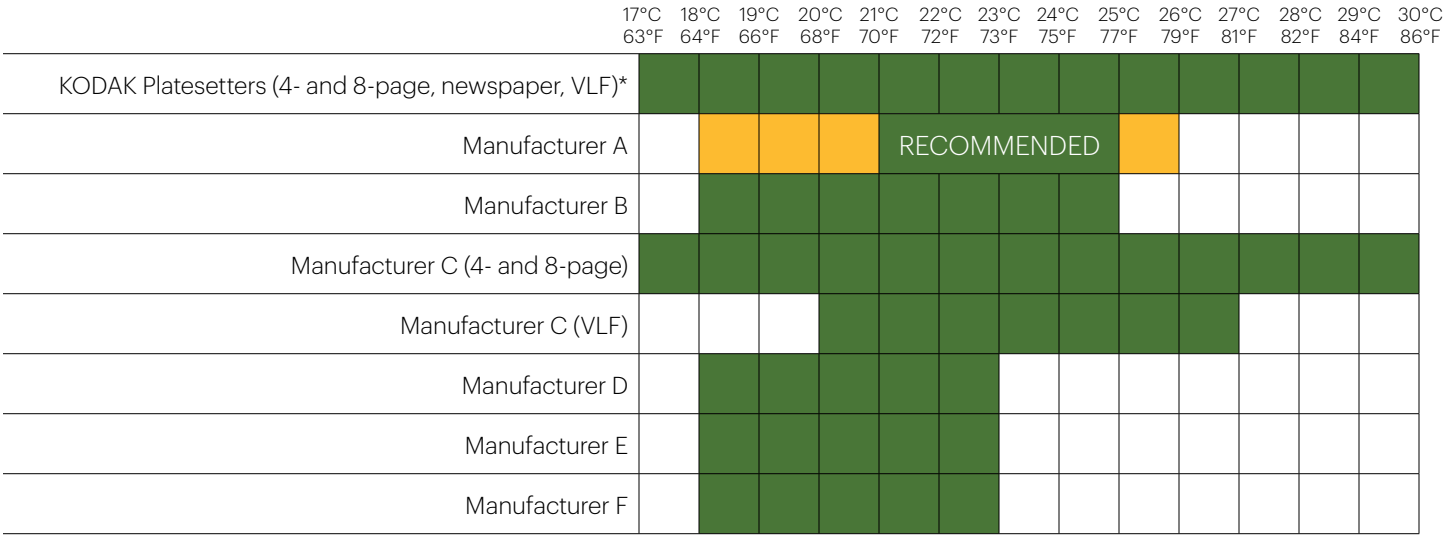
However, a plate imaged with a KODAK Platesetter would automatically be adjusted to fit the previous set. This is true even if the re-made plate was imaged on a different KODAK Platesetter from the original set, making the process of re-making a plate simpler, faster, and less prone to error.



New **C** with Kodak temperature compensation

NOT ALL CTP DEVICES ARE STABLE ACROSS A WIDE TEMPERATURE RANGE

The chart below shows the recommended temperature ranges for leading platesetters in the industry. Because of the temperature compensation technology built into the devices, KODAK Platesetters maintain consistent imaging through a temperature range of 17 to 30°C. Platesetters from other manufacturers generally have a much smaller range.



*Exception is KODAK MAGNUS Q800 Platesetters with temperature range to 20°C to 30°C

THE IMPORTANCE OF MAINTENANCE AND SERVICE

Maintaining CTP devices is essential for ensuring consistent performance and longevity. Here are some best practices:

- **Regular Cleaning:** Keep the device clean, especially the laser and optics. Dust and debris can affect imaging quality. Use appropriate cleaning solutions and tools recommended by the manufacturer.
- **Temperature and Humidity Control:** Maintain a stable environment. Fluctuations in temperature and humidity can affect the plates and the imaging process. Ensure the room is well-ventilated and climate-controlled.
- **Routine Calibration:** Regularly calibrate the device to ensure accurate imaging. Follow the manufacturer's guidelines for calibration frequency and procedures.
- **Software Updates:** Keep the device's software up to date. Manufacturers often release updates that improve performance and fix bugs.
- **Preventive Maintenance:** Schedule regular preventive maintenance checks. This includes inspecting mechanical parts, checking for wear and tear, and replacing parts as needed.
- **Proper Handling of Plates:** Handle plates with care to avoid scratches and contamination. Store them in a clean, dry place.
- **Training:** Ensure that all operators are well-trained in using and maintaining the CTP device. Proper training can prevent many common issues.
- **Documentation:** Keep detailed records of maintenance activities, calibrations, and any issues encountered. This helps in troubleshooting and ensures compliance with any regulatory requirements.

Temperature compensation technology is vital for platesetting devices to ensure consistent and high-quality plate imaging. Temperature fluctuations can cause thermal expansion and contraction of plates, affect chemical reactions in the plate coatings, and impact the performance of imaging components like lasers. By using high-accuracy temperature sensors, CTP devices can monitor and adjust the temperature during the imaging process, mitigating these effects and maintaining precise imaging quality. Regular maintenance and service are crucial for the optimal performance and longevity of CTP devices. Keeping up best practices maintain high-quality plate imaging, reduce downtime, and improve overall efficiency.

Comprehensive CTP Services

Kodak offers a range of services for CTP devices to ensure optimal performance and support for customers. Here are some key aspects of Kodak's CTP services:

- **Technical Support:** Kodak provides comprehensive technical support to help troubleshoot and resolve any issues with CTP devices. This includes remote support and on-site visits by trained technicians.
- **Maintenance and Upgrades:** Regular maintenance services are available to keep your CTP devices running smoothly. Kodak also offers upgrade options to enhance the speed, automation, and functionality of existing equipment.
- **Certified Pre-Owned Program:** For those looking to purchase used equipment, Kodak's Certified Pre-Owned CTP Device Program ensures that the devices have been inspected and certified by Kodak, reducing the risk associated with buying used equipment.
- **Mobile CTP Control App:** Kodak's Mobile CTP Control App allows users to remotely monitor and manage their CTP devices. This app provides real-time data on job status, environmental conditions, and more, making it easier to oversee operations from anywhere.
- **Training and Consultation:** Kodak offers training programs to ensure that operators are well-versed in using and maintaining CTP devices. They also provide consultation services to help businesses optimize their prepress operations.

These services are designed to help businesses maintain high-quality plate imaging, reduce downtime, and improve overall efficiency.

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