

## THERMAL TRANSFER PRINTING PROBLEM SOLVER

Top quality thermal transfer printing is always a result of compatibility between material and hardware. Print quality problems can be caused by a multitude of sources or combination of sources. Below is a list of parameters which affect the thermal transfer printing process:

1. Melting behavior of the transfer ink.
2. Melting viscosity.
3. Thermal conductivity of the base film.
4. Cohesion and adhesive forces.
5. Change in volume.
6. Thickness and smoothness of the transfer ink layer.
7. Homogeneity of the transfer ink layer.
8. Heat stability of the base film.
9. Thickness of the base film.
10. Characteristics of the substrate.
11. Contact force of the printhead.
12. Thermal characteristics of the thermal print head.
13. Peel angle of the ribbon.
14. Type of print head.
15. Speed of printer.

We have listed a number of typical print problems, their probable cause, and possible solution:

1. Poor edge definition.
2. Images are smearing.
3. Bar code elements have the incorrect width.
4. The print contrast ratio is incorrect.
5. The image is grayish or translucent, but characters are full.
6. The printed image has void areas.
7. There are repetitive voids in the printed image.
8. There are streaks or dead spots in the printed image.
9. No image is being printed or only a faint image is printed.
10. The ribbon is wrinkling.
11. The ribbon is breaking.
12. The ribbon and media are not advancing at the same rate.
13. There is excessive sticking between the ribbon and the media.
14. There is excessive noise during printing.
15. Die cut labels continue to feed without calibrating.
16. The printer doesn't stop when the ribbon runs out.
17. The printer stalls or will not print.
18. The used ribbon cannot be removed from the take-up shaft.
19. There is premature print head failure.

**Problem: Poor edge definition.** This is primarily an issue with bar codes

- Potential cause: The ribbon and media are not compatible.  
Solution: Evaluate ribbon/media compatibility. Change ribbon or media.
- Potential cause: The print speed is too fast  
Solution: Reduce print speed

**Problem: Images are smearing.** This is primarily a concern with bar codes

- Potential cause: Print head heat levels are too high  
Solution: Reduce the energy/heat setting of the printer.
- Potential cause: Print speed is too high.  
Solution: Reduce print speed.
- Potential cause: Print orientation. In all but the most recently released printers, print orientations of 90 or 270 degrees can result in feathering or bleeding edges of characters or bars within bar codes.  
Solution: Re-orient the text or code to 0 or 180-degree orientation (i.e. picket fence orientation for bar codes).

**Problem: Bar code elements have the incorrect width.** The bars within a bar code may be too thick or too thin resulting in poor scan results.

- Potential cause: Printer energy/heat is too high resulting in over burn (blooming or thicker bars).  
Solution #1: Reduce the energy/heat setting of the printer.  
Solution #2: Switch to a ribbon with a lower sensitivity.
- Potential cause: Printer energy/heat is too low resulting in under-imaged or bars that are too thin.  
Solution #1: Increase the printer energy/heat setting.  
Solution #2: Switch to a ribbon with a higher sensitivity.
- Potential cause: Printer speed is too high.  
Solution: Slow printer speed.
- Potential cause: The ribbon is worn or old.  
Solution: Change ribbon

**Problem: The print contrast ratio is incorrect.**

- Potential cause: The substrate is too dark to provide an adequate contrast to the printed image. This may be caused by the color of the stock or the color of ink that may have been preprinted under the imaged text.  
Solution: Change to a substrate with a lighter color or change preprinted ink colors to lighter colors.
- Potential cause: Print head energy/heat is set too low.  
Solution: Increase the print head energy/heat setting.

**Problem: The image is grayish or translucent, but characters are full**

- Potential cause: The print head energy level is set too high.  
Solution: Reduce the print head energy.
- Potential cause: The print head pressure is too high.  
Solution: Reduce the print head pressure.
- Potential cause: The ribbon and media are not compatible.  
Solution: Change the ribbon and/or media.

**Problem: The printed image has void areas.**

- Potential cause: Dust on the substrate.  
Solution #1: Clean the substrate. Compressed air.  
Solution #2: Place static discharge device (tinsel) across the substrate web.
- Potential cause: The surface of the substrate is not level or has coating streaks/voids.  
Solution: Choose a facestock compatible with thermal transfer printing.
- Potential cause: The ribbon and media are not compatible.  
Solution: Change the ribbon and/or media.
- Potential cause: The print head elements are dirty or obstructed (NOTE: 74% of premature print head failure is due to overheating caused by a buildup of residue on print heads).  
Solution: Clean the print head with a pre-saturated cleaning card or soft stemmed cotton swab and isopropyl alcohol.
- Potential cause: The print head elements are burned out (NOTE: 74% of premature print head failure is due to overheating caused by a buildup of residue on print heads).  
Solution: Replace the print head.
- Potential cause: The print head is misaligned.  
Solution: Check alignment using a ribbon and media combination well known for consistent performance. If necessary realign.

**Problem: There are repetitive voids in the printed image**

- Potential cause: The print head elements are dirty or obstructed.  
Solution: Clean the print head with a pre-saturated cleaning card or soft stemmed cotton swab with rubbing alcohol.
- Potential cause: The print head elements are burned out or worn out.  
Solution: Replace the print head.

**Problem: There are streaks or dead spots in the printed image**

- Potential cause: Poor coating quality on the media.  
Solution: Replace media.
- Potential cause: The print head elements are dirty or obstructed.  
Solution: Clean the print head with a pre-saturated cleaning card or soft stemmed cotton swab with rubbing alcohol.
- Potential cause: The preprinted ink is picking.  
Solution: Replace the media stock. Have preprinted media printed with heat resistant ink.

**Problem: No image is being printed or only a faint image is printed**

- Potential cause: The ribbon is loaded backwards.  
Solution: Use tape to determine the "colorant" side of the ribbon. If the ribbon is loaded backwards, remove the ribbon and insert it correctly.
- Potential cause: The ribbon and media are incompatible.  
Solution: Test a different ribbon with the media or test different media with the ribbon.

**Problem: The ribbon is wrinkling**

- Potential cause: The print head is misaligned.  
Solution: Realign the print head.
- Potential cause: The guide bar is misaligned.  
Solution: Realign the guide bar.

- Potential cause: The print head energy setting is too high.  
Solution: Reduce the print head energy setting.
- Potential cause: The rewind tension is greater than the unwind tension.  
Solution: Adjust the tension (the unwind tension should be greater than the rewind tension)
- Potential cause: The ribbon is feeding unevenly.  
Solution: Remove the ribbon and reload it.
- Potential cause: The media is migrating out of the feed path.  
Solution: Make sure the media is flush against the printer on the media roll bar and the guide bar is up and just beyond the outside edge of the media.
- Potential cause: The ribbon rewind shaft is out of alignment.  
Solution: Service is required to realign or replace the ribbon rewind shaft.
- Potential cause: The print head pressure is too high.  
Solution: Reduce the print head pressure.
- Potential cause: The ribbon is too narrow or wide for the media.  
Solution: Make sure the ribbon width is equal to or slightly greater than the media width.

**Problem: The ribbon is breaking**

- Potential cause: The print head elements are dirty or obstructed.  
Solution: Clean the print head with a pre-saturated cleaning card or soft stemmed cotton swab with rubbing alcohol.
- Potential cause: There is an obstruction in the ribbon feed path.  
Solution: Check for and remove media debris or other particles from the feed path and print head assembly.
- Potential cause: The print head energy setting is too high.  
Solution: Reduce the print head energy setting.
- Potential cause: The print head pressure is too high.  
Solution: Reduce the print head pressure.
- Potential cause: The printer is set on direct thermal mode.  
Solution: Set the printer to thermal transfer mode.
- Potential cause: The unwind tension is too high.  
Solution: Reduce the unwind tension.
- Potential cause: There is insufficient or no back coating on the ribbon.  
Solution: Replace the ribbon.

**Problem: The ribbon and media are not advancing at the same rate**

- Potential cause: The rewind tension is too low.  
Solution: Increase the rewind tension.
- Potential cause: The ribbon is sticking to the print head.  
Solution: Clean the print head with a pre-saturated cleaning card or soft -stemmed cotton swab with rubbing alcohol.
- Potential cause: The media surface is too slick for the ribbon.  
Solution: Test different ribbon grades or change to a matte-coated media stock in place of gloss stock.
- Potential cause: The unwind tension is too high.  
Solution: Reduce the unwind tension.

**Problem: There is excessive sticking between the ribbon and the media**

- Potential cause: The print head energy setting is too high.  
Solution: Reduce the print head energy setting.
- Potential cause: The print head pressure is too high.  
Solution: Reduce the print head pressure.
- Potential cause: The angle at which the media is exiting the printer is too steep.  
Solution: Adjust the angle down.

**Problem: There is excessive noise during printing**

- Potential cause: The print head energy setting is too high.  
Solution: Reduce the print head energy setting.
- Potential cause: The strip plate on the printer is not adjusted properly.  
Solution: Lower the strip plate.

**Problem: Die cut labels continue to feed without calibrating**

- Potential cause: The label sensor is dirty or obstructed.  
Solution: Clean the sensor with a soft-stemmed cotton swab with rubbing alcohol or compressed air.
- Potential cause: The printer is set in continuous mode.  
Solution: Change the printer setting to "label" mode in label software.
- Potential cause: The die cut label length is less than the minimum length for the specific printer model.  
Solution: Change to a two-up format.
- Potential cause: The label sensor may not be aligned properly with gap between the die cut labels.  
Solution: Realign the label sensor.

**Problem: The printer doesn't stop when the ribbon runs out**

- Potential cause: The ribbon sensor is dirty or obstructed.  
Solution: Clean the ribbon sensor with a soft-stemmed cotton swab and rubbing alcohol or compressed air.
- Potential cause: The ribbon sensor is out of position.  
Solution: Align the ribbon sensor properly.
- Potential cause: The ribbon trailer is incorrect for the specific printer model.  
Solution: Contact your ribbon supplier to confirm that the correct trailer is attached.

**Problem: The printer stalls or will not print**

- Potential cause: The ribbon or media is not loaded properly.  
Solution: Reload the ribbon and media, making sure both pass under their respective sensors.
- Potential cause: The ribbon color density is too light to be seen by the ribbon sensor.  
Solution: Clean the ribbon sensor with a soft-stemmed cotton swab and rubbing alcohol or compressed air.
- Potential cause: The media is too opaque to be seen by the label gap sensor.  
Solution: Consult your printer manual on recalibrating the sensor, or contact your media supplier for liner alternatives.
- Potential cause: The printer is in label mode and you are running continuous material.  
Solution: Change the media type to continuous on the printer or in the label software.

**Problem: The used ribbon cannot be removed from the take-up shaft**

- Potential cause: The rewind tension is too high.  
Solution: Reduce the rewind tension and/or begin using empty cores on the rewind shaft as take-up cores.

**Problem: There is premature print head failure**

- Potential cause: Excessive thermal stress.  
Solution: Make sure the print head energy is set as low as possible while still printing an acceptable image.
- Potential cause: The print head pressure is too high.  
Solution: Choose thinner gauge media or reduce the print head pressure.
- Potential cause: Insufficient print head maintenance.  
Solution: Print heads must be cleaned after every ribbon or media roll change. Use a pre-saturated cleaning card or a soft-stemmed cotton swab with rubbing alcohol. The inside of the printer, including parts along the media feed path must also be wiped down using a slightly damp cloth to eliminate dust which is drawn to the print head while the printer is running and can fuse to the print head surface causing elements to burn out.
- Potential cause: The rewind tension is too high.  
Solution: Reduce the rewind tension.
- Potential cause: The media surface is uneven.  
Solution: Without redesigning or changing the media, the edges of the raised area will abrade the print head more quickly than the rest of the media surface will.
- Potential cause: The ribbon width is not covering the media width.  
Solution: Make sure the ribbon width is equal to or slightly greater than the media width.

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