

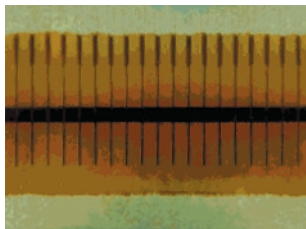


Thermal Printhead Life

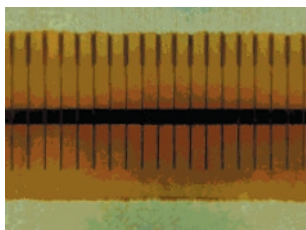
The printhead is the most critical component of your printer and one of the most delicate. Most print quality problems are a direct result of improper care of the printhead. A consumable that wears over time, much like the brakes on your car, it requires proper installation and ongoing maintenance to ensure a long life of service for your printer.

Maximizing printhead life is important to users of thermal printing technology because it reduces printhead replacement costs and increases productivity. However, with proper installation, ongoing careful attention and maintenance, you can maximize the life of a printhead.

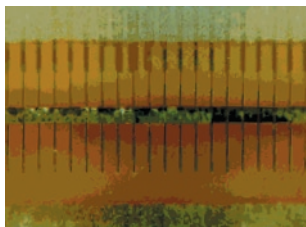
Below are photographs of three printheads. The first printhead is brand new. The second has printed over one million linear inches of thermal transfer labels and has been properly maintained. The third printhead has printed far fewer labels, but without proper care and maintenance, signs of abrasion and contamination buildup are evident.



New Printhead



Properly Maintained Printhead
Over 1 Million Inches



Printhead Without Proper Care
Less Than 1 Million Inches
General Printhead Guidelines

I. Printhead replacement

- When replacing your printhead, be sure to follow the directions in the maintenance manual for your printer model. The following steps can maximize your printhead's life:
 - 1.) Return the printer darkness and the printhead pressure back to factory settings if printhead problems had required compensated settings.
 - 2.) Be sure that the replacement printhead resistance matches the printer's printhead resistance setting.
- Only use a genuine Zebra printhead to ensure that your printer and part warranties remain intact and that the product performs optimally.
- Zebra recommends that Zebra's Depot Centers or a Zebra Authorized Service Provider (ZASP) perform the installation (http://www.zebra.com/SS/repair_search.htm).
- All ESD precautions should be followed when installing or servicing a printhead.
- Zebra recommends cleaning the printhead with Zebra approved products before printing. [See Section IV & V for cleaning recommendations and how to buy cleaning products.](#)
- Generally speaking, printhead life can be maximized by using a blended combination of darkness settings and toggle pressure forces to achieve the desired label print quality for your specific application. You should avoid using just the darkness settings or just the toggle pressure to achieve your desired print quality. Please see the maintenance manual for your printer model for more information on this subject.
- The maintenance manual specific to the printer model should be consulted when the printer is being serviced
- Printing in direct thermal mode may contribute to shortened printhead life due to the potential for increased abrasion.

II. Printhead Terminology

Abrasion

Abrasion—or the process of wearing down by friction—may occur during normal operation of the printer. However, it can be minimized through proper care and maintenance.

Contamination

When particulate matter—such as dust—damages the printhead, it becomes contaminated.

Corrosion

Gradual deterioration of the printhead may occur because of media, incorrect cleaning agents or the environment.

Electrostatic Discharge (ESD)

Electrostatic discharge may occur due to improper handling or the environment.

Moisture

If your printer is operating in a humid or damp environment, this moisture may damage the printhead.

Residue

The buildup of residue—or foreign materials—may occur with improper maintenance, incorrect cleaning agents, inferior media or incorrect application setup. Aggressive cleaning requires the use of Zebra's specially-formulated *Save-a-Printhead* Cleaning Film ([see Section V for part numbers and ordering instructions](#)).

III. Avoid the Contributing Factors to Premature Printhead Failure

There are several factors that can contribute to the premature failure of a printhead. The following information identifies these factors and provides possible solutions.

ABRASIVE WEAR

Normal abrasive wear of the printhead's protective coating occurs due to friction, regardless of the materials used or the maintenance performed. Once the protective coating is worn away, the printhead elements will be damaged—resulting in printhead failure. For this reason, the printhead can be considered a consumable item and may require periodic replacement over the life of the printer. This abrasion may be more aggressive when the following conditions occur.

Contributing Factor	Recommendation
Use of Direct Thermal Media for Non-Ribbon Applications Direct Thermal media requires the paper surface be in direct contact with the printhead elements. This increases friction and can cause a reduction in printhead life when compared to a similar application using ribbon. The quality of the media and its compatibility with the thermal printing is important.	To minimize abrasion, be sure you are using high-quality Direct Thermal media from a proven supplier. If applicable, you may want to consider using a Thermal Transfer media with a ribbon.
Buildup of Paper Dust Paper dust can collect on the platen at the outer edges of the media or ribbon, creating a grinding wheel effect. This can abrade the printhead glaze, which will result in printhead failure.	Clean all paper dust buildup on the platen and printhead. Brush or blow the dust in the media path and clean the platen with a lint-free cloth and isopropyl alcohol around the entire circumference of the platen.
Printhead Pressure Excessive pressure increases friction on the printhead assembly, resulting in higher abrasion. Printhead pressure should be evenly balanced across the media. A balance of darkness and pressure should be used to generate an acceptable image on properly matched materials. <i>Note: This only applies to printers with adjustable pressure settings.</i>	Printers with a single moveable head pressure toggle should center the toggle over the media width. Printers with dual-pressure toggles adjust both evenly over full-width media or reduced outboard pressure for narrower widths. This allows the pressure to focus over the narrow media more efficiently.

CONTAMINATION

Media can contain or be introduced to abrasive contaminants that pass through the printhead and scrape or cut through the protective coating on the printhead. Once the protective element coating is damaged, printhead element failure occurs. If premature or random printhead failure occurs as a result of a scratched printhead element, the media or environment may be introducing contamination.

Contributing Factor	Recommendation
Contaminated media	Consult with your media supplier.
Environment	Protect the media from exposure to contamination. If printer location is problematic, consider using a protective enclosure.

CORROSION

Substances in contact with the printhead elements can become corrosive and can generate caustic agents when heated, causing corrosion of the printhead's protective coating and printhead failure.

Contributing Factor	Recommendation
Unapproved media may be coated with chemicals or flood coats unsuitable for direct thermal printing.	This is often characterized by a rapid failure of the printhead in the area of the flood coat. Consult with your media supplier if this failure is suspected.
Physically touching the printhead element surface with the human skin can cause contamination detrimental to the life of the printhead.	Clean any surface with an approved cleaning solution before operating the printer. Consult the printer's user guide for recommended cleaning procedures.
Improper cleaning or use of unapproved solutions on the printhead.	Use only approved cleaning items for printhead cleaning.

ELECTROSTATIC DISCHARGE (ESD)

Electrostatic discharge can damage a printhead's internal electronic circuitry.

Contributing Factor	Recommendation
Improper handling of the printhead assembly	See your printer's user guide for more information about how to prevent ESD when handling the printhead.
Static buildup from media/ribbon	Ensure that any static brushes (if applicable) and printhead mechanism wiring are properly secured.

RESIDUE BUILDUP

Buildup of ribbon coating or direct thermal media coatings on the printhead's elements can interfere with heat transfer, causing the heater elements to overheat to the point of failure

Contributing Factor	Recommendation
Improper maintenance	Follow recommended cleaning intervals using the proper cleaning accessories. Try the <i>Save-a-Printhead</i> cleaning strip for more aggressive buildup.
Excessive darkness settings	Possibly a compensation for improperly matched ribbon/media, imbalanced printhead pressure, higher print speed than recommended for the materials used.

IV. Maintenance

- Zebra recommends the cleaning of the printhead regularly, either after every roll of thermal transfer ribbon or after every roll of direct thermal labels. (Additional cleaning may be necessary based on the application and environment.)

Note: For 600 dpi printers, clean after each roll of media or when a "CLEAN HEAD NOW" warning appears on the liquid crystal display (LCD).

- When handling or cleaning the printhead, remove any jewelry that may scratch it. Use a grounding strap or antistatic mat to discharge static electricity that could also damage the printhead.
- Zebra recommends cleaning the printhead with Zebra-approved cleaning supplies.
- Zebra media provides the highest compatibility and favorably contributes to printhead life.

V. Cleaning Supplies

Your user's guide and maintenance manual may recommend one or more of the following cleaning kits or items.

PART NUMBER	ITEM	DESCRIPTION	MODELS
P/N 46902	<i>Save-a-Printhead</i> Cleaning Film	Three 10" long strips of film. 3.0" – 4.0" (76 mm–102 mm)	90XIII, 90XIII+, 96XIII, 96XIII+,
P/N 44902	<i>Save-a-Printhead</i> Cleaning Film	Three 10" long strips of film. 4.0" – 5.0" (102 mm–127 mm)	Z4000, Z4M, 105Se, 105SL, 110PAX, 110XIII+
P/N 48902	<i>Save-a-Printhead</i> Cleaning Film	Three 10" long strips of film. 5.0" – 6.0" (127 mm - 152 mm)	140XIII, 140XIII+
P/N 38902	<i>Save-a-Printhead</i> Cleaning Film	Three 10" long strips of film. 6.0" – 7.0" (152 mm - 178 mm)	170XIII, 170XIII+, 160S, Z6000, Z6M
P/N 22902	<i>Save-a-Printhead</i> Cleaning Film	Three 10" long strips of film. 8.0" – 9.0" (178 mm - 229 mm)	220XIII, 220XIII+
P/N 105950-035	Printhead Cleaning Pen	Contains 12 cleaning pens	All

VI. Ordering Information

There are two ways to purchase Zebra-approved cleaning supplies:

- 1.) Purchase directly from Zebra at: <http://www.zipzebra.com/Home.asp>

Note: Be sure to specify the Part Number from the table above in the "Site Search" field in the top-right corner of the site.

- 2.) Purchase through a Zebra reseller, which you can locate at:
http://www.zebra.com/About/form_buy_inquiry.htm