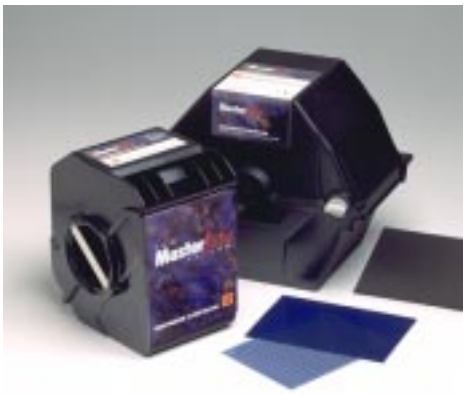
Computer Output Microfilm Data Sheet

KODAK IMAGELINK DL 1000 Microfilm / 2482



Description

Kodak Imagelink DL 1000 Microfilm 2482 is a rapid-access, thermally processed **(dry)** silver computer output microfilm. This film is designed to be exposed by a **red** (helium neon) **laser.** When developed, a *positive* appearing image is formed (dark characters on a light background).

Kodak Imagelink DL 1000 Microfilm is an extremely fine-grain, high-contrast microfilm which offers the highest quality thermally processed microimage available. When DL 1000 is used with *Kodak* Premium 1000 Thermal Print Film 1323, a very high-quality duplicate is achieved at optimum equipment throughput speeds.

Product applications

Kodak Imagelink DL 1000 Microfilm is designed to generate positive-appearing camera originals in fiche format from helium-neon lasers used in **dry** computer output microfilmers (COM) equipment such as the *Kodak Komstar* 100/200/300 Microimage Processors, *Kodak Komstar* Microimage Processor IV, *Kodak Optistar* Datawriter, *Kodak Optistar* V Processor, *Kodak Komstar* Processor V, and the *Kodak Optistar* Image Writer. This film can be handled in room light and the equipment it is used with does not require any special plumbing, venting or dark rooms.

Imagelink DL 1000 Microfilm is primarily used to make masters for generating negative-appearing distribution copies (clear characters with dark background) on thermal print film. Positive- or negative-appearing copies can also be made on diazo or silver films, depending on customer preference. This film is not intended to be used as the primary “working” copy or for frequent use in reader printers.

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Features and benefits

- **High contrast**
- **Extremely fine granularity**
- **Ultra-high resolving power**
- **Very slow speed**
- **Optimum sensitization for helium-neon lasers (633 nm) for character exposure and filtered tungsten source for forms overlay**
- **Blue-tinted 4 mil *Estar* Base of 0.1 nominal visual density**
- **The sensitized layer of this film contains an organic silver compound and an incorporated developing agent**
- **When properly handled and stored, information on this film can be retrieved for at least 100 years**
- **Meets requirements of ANSI/NAPM IT9.19-1994 for thermally processed silver microfilms**
- **Re-formulated emulsion layer**

  Improved image tone, resulting in blacker characters; reduces post-process print-up; improves raw stock keeping, resulting in invariant speed; improves halation protection

- **New conductive antistat layer and copolymer backing**

  Reduces dirt attraction, resulting in cleaner dupes; improves transport and handling; lowers duplicator exposure time, increasing productivity; reduces Newton's Rings on dupes; newly patented technology

- **Improved overcoat**

  Improves overcoat adhesion on processed fiche; newly patented technology

Physical properties (before-process)

Nominal thickness data

Unprocessed Film	
Base	4.0 mil
Emulsion	0.5 mil*
Total	4.5 mils

*blue-tinted, *Estar* Base; backing: antistat layer and copolymer topcoat—negligible

Handling

Film not in cartridges should be handled in total darkness. Unexposed film in its cartridge can be handled in room light.

Storage

Store unopened packages of film at 21˚C (70˚F). If storage for longer than three months is needed, 13˚C (55˚F) or lower is recommended. Keep the film at 50-percent relative humidity or below, and protected from radiation and x-rays. To avoid moisture condensation on the film, cold or frozen film should be warmed throughout to approximate room temperature before the package is opened, six hours if refrigerated, or overnight if frozen. Once a package is opened, do not refrigerate or freeze the film. If the *Kodak Komstar* Microimage Processor will be shut down for 4 hours or more, unthread the film from the film transport.

Image Structure

Resolving Power: (based on recommended process)

Test-Object Contrast 1000:1 (ISO-RP)
1000 lines/mm

These values were determined by a method similar to the one described in ISO Standard 6328-1982 *"Photography—Photographic Materials—Determination of ISO Resolving Power."*

Diffuse RMS granularity: 15

Read at a net diffuse density of 1.00 (with a *Kodak Wratten* Gelatin Filter No. 47B) using a 48-micrometre aperture.

Processing

Kodak Komstar Microimage Processors contain a heated metal drum which processes this film at 1.8 metres (6 feet) per minute. Starting point recommendations are 119 ±½˚C (246 ±1½˚F) for five (5) seconds.

Duplicating masters

Print film density aims recommended when printing from *Kodak Imagelink* DL 1000 Microfilm / 2482 Microfilm masters onto *Kodak* Premium 1000 Thermal Print Film 1323:

***Kodak* Premium 1000 Thermal Print Film 1323**	
Optimum Background Density	2.20
Preferred Background Density Range	1.90 to 2.25
Minimum Background Density	0.80

Kodak Imagelink DL 1000 Microfilm / 2482 Microfilm Densitometry = Diffuse Status M Blue

Kodak Thermal Print Film 1353/1323 Film Densitometry = f/4.5 Visual Projection

See *Kodak* Publication D-49 for a description of *Kodak* Thermal Print Films.

Photographic properties

The following data are based on development in the *Kodak Komstar* Microimage Processor as recommended.

Exposure

Kodak Imagelink DL 1000 Microfilm / 2482 is exposed inside a computer output microfilmer using a helium-neon laser for characters and a tungsten light or helium-neon laser exposure for the forms slide.

The optimum exposure intensity setting is determined by selecting from a complete intensity series produced according to procedures as indicated under Exposure Optimization below.

Spectral Sensitivity

Optimum sensitizing for helium-neon lasers (633 nm).

Exposure optimization

To determine the proper COM and duplicator exposure settings, perform the following procedure:

1. **Produce a processed BLANK master fiche from the COM.**

2. **Run an exposure series on the duplicator.**
   - Request 11 copies in the semiautomatic or manual mode.
   - Set the exposure to 1.0.
   - Using the fresh *Kodak Imagelink* DL 1000 fiche, start the copy cycle.
   - After each exposure increase the exposure setting by 0.1.
   - There should be 11 fiche produced, with increasing background densities.

3. **Using either a densitometer or the *Kodak* Thermal Print Density Comparator, select the fiche which has a density of 2.2 or close to, but not darker than the "Upper Limit" patch on the *Kodak* Comparator.**

   This will become the background onto which the* Komstar *characters will be printed.

4. **Produce an exposure series of *Komstar* data onto *Kodak Imagelink* DL 1000 Microfilm such that it can be duplicated onto a fiche with the proper background density.**

   Depending on the *Komstar* being used, this can be done in several ways.

   ***Kodak Optistar* Image Writer**

   Note the current intensity settings.

   Run either a test job or the "Quality Monitor Test" from the *Optistar* Systems Console. Run the job several times and vary the intensity up or down (in increments of 10) each time.

   ***Komstar* 100/200/300 Microimage Processors, *Komstar* Microimage Processor IV, and *Optistar* Processor V**

   Run either a test job or the "Quality Monitor Test" from the *Optistar* Systems Console. As the *Komstar* is running and starts a new column of data (determined by either counting frames or listening for the camera to change directions), increase the "Data Intensity" setting by one. This should produce a fiche with 8 columns of data at 8 different settings.

5. **After you have produced a master fiche with varying densities, the next step is to duplicate that data at the duplicator exposure setting which you determined yielded the proper background density.**

   Make 3 copies, use the second, and observe it in a viewer starting with the lowest exposure. Look for the *Komstar* setting which yields the brightest and most defined character. If necessary make paper prints to determine optimum settings.

6. **Once the *Komstar* data and forms intensity settings are determined, produce a master and duplicate fiche at those settings for future reference.**

After-processing information

Handling

As with all photographic products, exercise care to avoid scratches, abrasions, and fingerprints. It is recommended that camera originals be handled as little as possible and with lint-free nylon or cotton gloves.

Print-up

Because this is a heat-processed film with incorporated developers, extreme heat or an intense light source, i.e., readers and printers, can cause further development of the background area. Darkening of the background is called print-up. Print-up is cosmetic in nature and does not duplicate onto the second generation copy. *Kodak Imagelink* DL 1000 Microfilm has properties which reduce print-up.

Viewing and Printing

Readers and viewers are a source of heat and light at the film plane and can possibly cause print-up. A reader whose gate temperature does not exceed 65˚C (150˚F)* will, even after the film has been viewed for several hours, maintain sharp and easily read images. Readers and viewers can be a source of scratches and abrasions. For these reasons, it is recommended that, whenever possible, only test fiche be used in a reader.

*If the heat at the film plane is kept at 65˚C (150˚F) or lower when measured as specified in ANSI/NAPM IT9.19-1994, this print-up has no practical effect when viewing on a reader or in making duplicates on a printer.

Keeping (life expectancy)

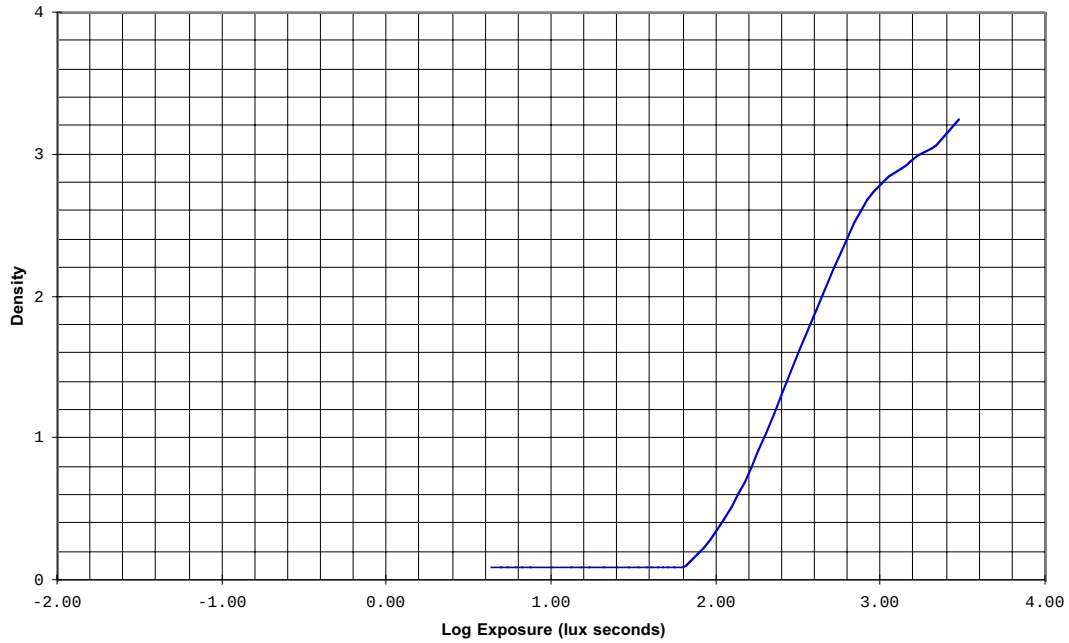
For optimum storage life, store processed film in the dark at 70˚F (21˚C), 50-percent relative humidity or below, with other conditions as specified in American National Standard ANSI/NAPM IT9.11-1993, *Imaging Media—Processed Safety Photographic Films—Storage*. The useful life of *Kodak Imagelink* DL 1000 Microfilm can only be estimated from incubation tests at accelerated conditions since the film has not been manufactured long enough to have experienced practical losses of the image. Extrapolation of high temperature keeping behavior to room temperature storage is always subject to some uncertainties. On the basis of work done at Eastman Kodak Company and by the ANSI/NAPM IT9-4 subcommittee, this film is estimated to maintain a usable image for at least 100 years when processed as recommended, and handled and stored as described in ANSI/NAPM IT9.11-1993. Storage at low temperature provides greater assurance of satisfactory image stability. The recent specifications for *Thermally Processed Silver Microfilm—Specifications for Stability* are listed in ANSI/NAPM IT9.19-1994.

NOTE: Refer to the latest revision of each ANSI or ISO Standard specified.

Characteristic curve

***Kodak Imagelink* DL Microfilm / 2482**

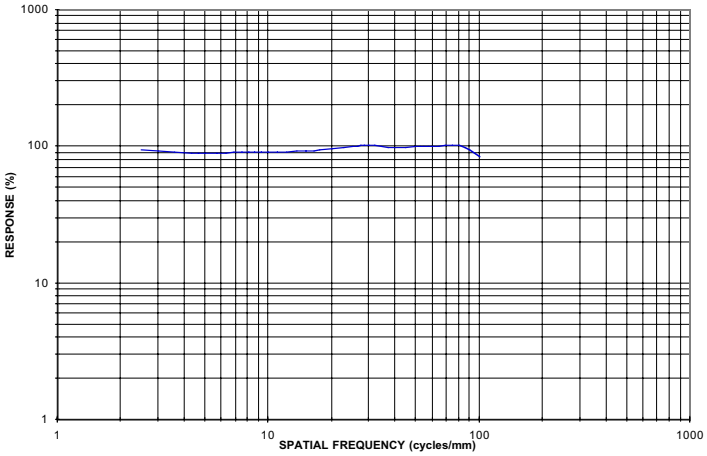
HeNe Laser; Heat Processed, 5 sec at 119°C (246°F); Status M Blue



Modulation transfer function curve

***Kodak Imagelink* DL Microfilm / 2482**

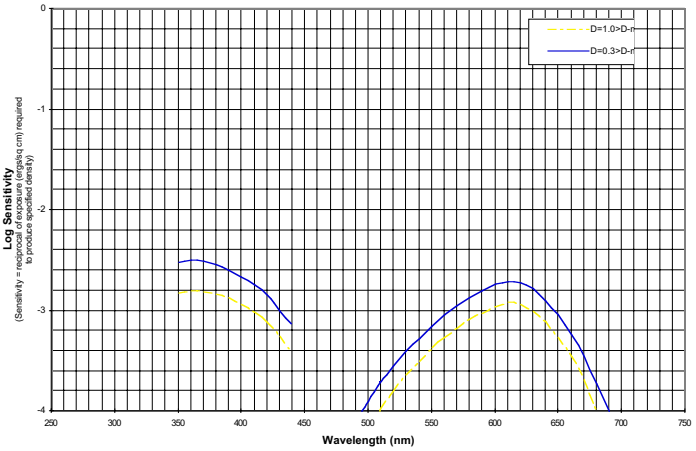
Heat Processed, 5 sec at 119°C (246°F); Status M Blue



Spectral sensitivity curve

***Kodak Imagelink* DL Microfilm / 2482**

HeNe Laser; Heat Processed, 5 sec at 119°C (246°F); Status M Blue



NOTE: These photographic modulation-transfer values were determined by using a method similar to the one described in ANSI/NAPM PH2.39-1977(R1990) *Photographic Modulation Transfer Function of Continuous-Tone Black-and-White Photographic Films, Method of Measuring*. The film was exposed with the specified illuminant to spatially varying sinusoidal test patterns having an aerial image modulation of a nominal 35-percent at the image plane, with processing as indicated. In most cases, the photographic modulation-transfer values are influenced by development-adjacency effects and are not equivalent to the true optical modulation-transfer curve of the emulsion layer in the particular photographic product.

Ordering information: *Imagelink* DL 1000 Microfilm

Code	Mil	Format	Spec	Desc	#/Case	CAT No.
2482	**4.0**	105 mm x 125 m	987	*Imagelink* DL 1000 Microfilm	4	**879 6542**
		105 mm x 200 m	929K	Professional DL 1000 Microfilm	2	**806 2911**
		105 mm x 200 m	929K	*Imagelink* DL 1000 Microfilm	2	**887 2764**

READ THIS NOTICE: The sensitometric curves and data in this publication represent product tested under the conditions of exposure and processing specified. They are representative of production coatings and, therefore, do not apply directly to a particular box or roll of photographic material. They do not represent standards or specifications which must be met by Eastman Kodak Company. The company reserves the right to change and improve product characteristics at any time.

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