ILFORD MICROGRAPHIC FILM: Long-term archiving of documents and images

Case study example: GUBLER AG

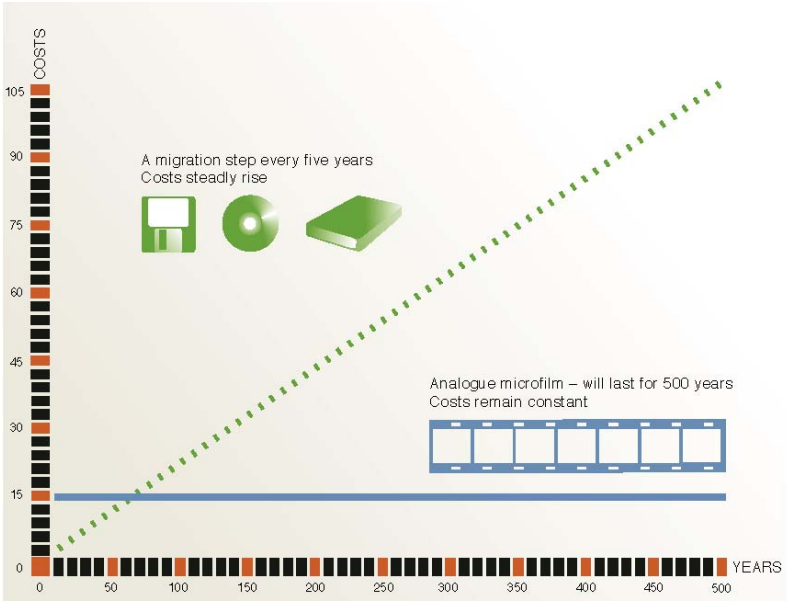
In many companies there is a growing conviction that digital data from important business processes (finance, legal & compliance, design, service, maintenance) cannot be reliably archived on existing electronic systems. Digital storage media such as hard disk, tape, DVD, etc. are not particularly suitable for this. They either do not offer long-term stability or, even more importantly, the scanners are no longer compatible after a few years. Service providers such as Gubler AG offer a solution: ILFORD colour MICROGRAPHIC FILM offers a migration-free, revision-proof medium that archives electronic documents from business, the sciences, politics, culture and the arts and keeps them available for posterity for over 500 years.

More and more data …

The transformation to the digital age has been completed in many businesses and private entities. Guaranteeing the legibility of important information over many decades represents a major challenge. The long-term storage of data is of major importance for companies, not least for legal reasons. Aircraft designers, for example, are obliged to archive their plans for decades, museums are required to keep digital copies of their pictures and exhibits for insurance purposes. Land registries also often have to archive building applications and approved projects for many years.

No matter what the field of application, the problem remains the same. Data written on media today has to be transferred to new storage media and possibly converted into new data formats roughly every five years (see diagram opposite). This generates high archiving costs, demands precise work processes and ties up human resources. Sceptics warn of the “Digital Dark Age” if the storage is not carried out carefully.

Image Stability on Microfilm



ILFORD MICROGRAPHIC FILM as an alternative

Film is a medium with high data density on which digital data (documents and images) can be easily backed up. ILFORD sees the ILFOCHROME colour MICROGRAPHIC FILM with its long-term stability as a solution to reliable data archiving. It is aimed at allowing long-term archiving and not as a substitution for online solutions. If, for example, an aircraft crashes, it is not necessary to redigitise the complete data on the aircraft in order to carry out a material investigation; the documents, such as construction plans, material testing and maintenance reports on the damaged aircraft wing, will suffice.

Unique artefacts have been put onto micro film to protect cultural assets in the event of armed conflicts since 1961 (Hague Convention). Additional information ("metadata") can also be saved in the process. The back-up films of the German National Society for Cultural Heritage Protection, for example, are stored in the Barbarastollen in Oberried near Freiburg im Breisgau and can be redigitised using scanners at any time.

The specialist laboratory at Gubler AG relies on the ILFORD MICROGRAPHIC film and tests suggest an archiving capability of up to 500 years. The long-term archiving film from ILFORD is a direct positive film based on the silver dye bleach process. The diazo pigments are already added to the emulsion during the production process which ensures long term image stability and avoids consequential costs for long-term archiving. The film is practically grain-free – small structures down to 3 micrometres in size can be written on it. Gubler AG offers various film formats and resolutions in order to provide the optimum solution for archiving. In the simplest variant, for example, plans in formats of up to 43.2cm x 59.4cm can be miniaturised to half-format (24 x 18 mm). An image with 41,800 x 29,860 pixels can be stored on the full fiche (10.5 x 14.8 cm). Several small files can be placed on the film with different spacing (nesting) according to the customer's wishes.

Gubler AG – pioneers in the field of archiving

Apart from the film, the laser imagesetter also plays an important role. During laser imagesetting,, the image is broken down into its colour channels, transferred to a red, green and blue (RGB) laser beam before the laser light, combined into a single beam, is directed onto the film.

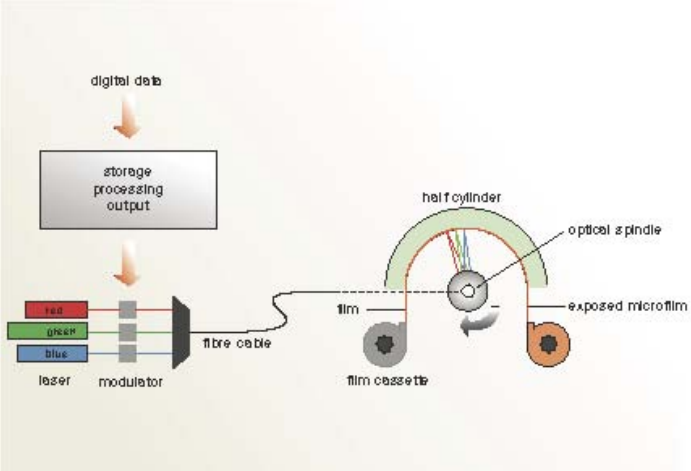
Gubler AG (www.mikrosave.ch) is a pioneer in the field of archiving. The service provider based in Felben, Switzerland, has been involved in the backup of valuable assets on ILFORD microfilm since 1957 and has been archiving digital data for over 10 years. Private collections, art galleries, museums, state and film archives, but also hospitals, photographers, advertising and image agencies, car designers, public utilities and financial institutes are amongst the company's clients.

The Swiss National Library, the Berne University Library and the Paul Klee Museum are among its better-known clients. For the Swiss National Library, for example, 40,000 posters (graphics, newspapers, photographic documents, etc.) were digitised and put onto micro film. More than 80,000 old hand-drawn geographic plans going back to the 16th century were archived for the Berne University Library, and more than 5,000 works were archived for the Paul Klee Museum.

Martin and David Gubler, Managing Directors of Fachlabor Gubler AG

At the end of 2006, the Fachlabor Gubler acquired the world's first colour roll film laser COM system, the Eternity 105. Gubler AG is currently the only service provider worldwide offering services with this system. The ILFORD MICROGRAPHIC film is exposed in film widths from 35 mm (miniature) up to 105 mm (e.g. DIN A6, COM fiche format). The Eternity 105 processes approximately 1 terabyte of data per day.

Eternity 105



The Eternity 105 is the world's first imagesetter for 105 mm colour microfilm. With its RGB laser technology, the patented process with parallel guide, it ensures an unrivalled precision with respect to metric stability or edge fringing. This quality is achieved because the laser beam is always directed perpendicularly onto the film and the film is not moved during exposure, so that a constant and hence a maximum degree of edge definition is always achieved. The spot size of the laser is only 3.4 micrometres, corresponding to around 149 line pairs per millimetre, permitting a file size RGB TIFF of 3.6 gigabytes per A6 fiche. In practice, and allowing for the necessity for redigitisation using commercially available scanners, we can thus save around 400 A4 pages on one fiche.

A high-speed internal-drum scanner moves the laser beam perpendicularly to the film, exposing one line at a time. The feed of the optical spindle allows the image to be scanned line-by-line, so that in a first version of the device 28,000 x 44,000 pixels can be exposed with high precision in 2½ minutes. Simple device calibration, various integrated control loops and the Mikrosave® system frame with integrated colour management, ensure consistent high quality and colour fidelity of the exposed film material.

How much fits on a film and what does it cost?

When archiving pictures (10 x 15), 400 holiday photos can be saved on the film. If the document comprises only of text, there is capacity for 100 and 400 A4 pages. In the case of A0 CAD plans the capacity is 16 plans.

The Eternity 105 allows up to one terabyte of data to be processed per day. This corresponds to 7,500 fiches or, expressed in other terms, one million A4 pages per month. The normal selling price for one fiche is approximately 5 Euros. With large data stocks, costs per terabyte of only € 5,000.- (images-on-film) or € 15,000.- can be expected. Note, however, that these are one off costs – a further data transfer is not necessary and the archiving is secure for over 500 years.

Applications: Catalogues, design plans, library archives (often between 1,000 and 10,000 fiches per project)
Suitable for the low-end/high-volume range and for the high-price one-off service.

Data capacity of the microfiche: 3.6 GB storage capacity (1 GB in practice)
The maximum storage density is 3.4 micrometres, the recommended storage capacity in practice 1 GB.

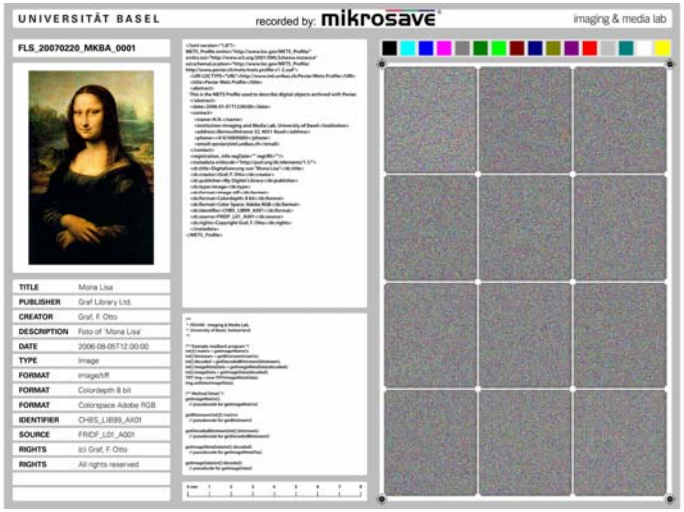
What data can be processed?

All formats can be processed in principle. In the case of images on film, the images are first transformed into TIFF format (Tagged Image File Format). Metadata from the TIFF headers are also converted into TIFF image information and stored together with the actual image. The file size may be up to 3 GB.

Larger images have to be split into several images. In addition to colour images, greyscale images can, of course, also be saved.
If random electronic data is involved, the microfilm is used as digital medium and – as with a DVD – a kind of barcode is written into the medium using a laser. The microfilm that is stable for 500 years, yet can be read with the simplest optical scanners, thus becomes the digital storage medium for any type of bitstream (bits-on-film).

How can data be read back?

The microfilm can be digitised at any time using commercially available scanners to create TIFF files again. Depending on the quality of the scanner, simple or even very high-quality image data can be regenerated.
In the case of bits-on-film, the data film is also digitised using commercially available scanners and read by using open-source decoders.



For photographic material or interviews with Mr Christian Neumann, Product and Marketing Manager at ILFORD or Mr Gubler, Managing Director of Gubler AG, please contact the press officer below.

About Mikrosave® Fachlabor Gubler AG

The Fachlabor Gubler AG based in Felbern, Switzerland, has been involved in the backup of important documents on the long-term stable ILFORD microfilm since the 1970s.
With the Mikrosave® product range (www.mikrosave.ch), the Fachlabor Gubler AG offers industrially produced laser microfilm for all branches throughout Europe. As a service company, it implements holistic solutions for reliable long-term archiving. The key services are digitising, data ingest and archiving using images-on-film and bits-on-film.

About ILFORD:
Founded in 1879, ILFORD is a leading player in the development and manufacture of photo quality media for both inkjet printing and colour photographic processes. The ILFORD worldwide Digital Imaging and Colour Photo businesses, including the R&D and manufacturing operations in Switzerland, are owned by Oji Paper, Japan.
The ILFORD name is well established in the history of Imaging and today it continues to be associated with cutting edge technology thanks to its strong links to the photo imaging marketplace, R&D, technical know-how and manufacturing capabilities.
For more information on ILFORD, please visit www.ilford.com

For further information contact:
ILFORD Imaging Switzerland GmbH
Jane Dixon – +44 (0)1565 68 3902 – jane.dixon@ilford.com
Tony Johnson – +44 (0)1565 68 3966 – tony.johnson@ilford.com