The evolution in imaging to unsurpassed large-format quality: from images, graphics and text direct on to conventional photo-material via a file.
The quality alternative: Durst Lambda 130

The direct exposure of digital image and text files on conventional photomaterials by laser imaging.

High-end imaging
The Durst Lambda 130 large-format digital imager: the new standard for digital large-format reflective or backlit displays directly from file. Due to the continuous exposure on rolls with widths from 50.8 to 127.0 cm (20" to 50") with automatic take-up (roll to roll), all the print sizes at present possible on horizontal enlargers can be produced in a minimum of space. The Durst Lambda 130 is the answer for efficient and fast large-format print production with uncompromising quality for:
- exhibitions
- fair stands
- illuminated displays

The key features
- Large-format prints directly from file Exposes digital images and text files directly and without the detour of a negative or transparency onto photographic silver halide materials (same palette of color materials a lab is using today).
- High image quality with clean grades Each color pixel is specified by one of 256 distinct levels of red, green and blue information and is imaged as one continuous tone point; achieving 16.7 million possible colors.
- Simple operation A clearly designed and easy-to-use interface guarantees truly simple operation.
- Print production without size limitations Uses roll paper in the widths from 50.8 cm (20 inch.) to 127.0 cm (50 inch). Print sizes exceeding the max. paper width are automatically divided-up and exposed in sections. Operator can select how oversized panels are split. The desired overlap is adjustable.
- Fast access to the printing media A 5-position paper turret for unexposed materials to allow a quick access to various materials (reflective and backlit materials, different paper widths, etc.). The requested media can be menu-selected from the computer (Autoload-Function).
- Open system Exposes image and text data from all major image enhancement systems as well as PC- and Mac-files (transfer via Ethernet or removable transfer media => SyQuest, CD-ROM, Exabyte etc.).
  Input formats:
  - RGB-TIFF (24 bit)
  - PostScript Level 2 (PS, EPS).
- High output speed All the materials are exposed at a linear speed of approx. 30 cm (12")/minute, which is equivalent to approx. 20 prints 100 x 130 cm (40 x 50 inch) per hour.
- On-the-fly changes in print size, colour and contrast The prints can be rotated, mirrored or cropped and corrected in colour, density and contrast without re-rasterizing the image (RIP).
- Multiple print function Small print sizes (from the same image file) can be exposed adjacent for optimum paper width use.
- Small footprint A small footprint in comparison to conventional horizontal enlargers (approx. 16 m² = approx. one third of the current space requirement).

The Durst Lambda 130 can be installed in rooms with a standard door 90 cm (35") wide (the imager is supplied in modules).
Functioning

Roll paper in the widths from 50.8 cm (20 in.) to 127.0 cm (50 in.). Print sizes exceeding the max. paper width are automatically divided-up and exposed in strips.

5-position paper turret for unexposed materials to allow a quick access to various media.

Automatic paper take-up device.
Single beam, 3 laser (RGB) exposure system.

Powerful Image Processor (DEC-Alpha-Workstation).

Exposes image and text data from all major image enhancement systems as well as PC- and Macintosh files (network or via data carrier: SyQuest, MO-Disk, CD-ROM, Exabyte, etc.).
1. Master
The paper channel calibration values can be quickly adjusted to any chemical drifts via the master channel.

2. Paper calibration
The Durst Lambda 130 features an extremely easy-to-use calibration system with a digital test image. Even with extreme deviations a new paper type can be calibrated in approximately three passes. Operation is limited to just three steps:
1. Exposure of the test print
2. Reading of the test print with the optional on-line densitometer (automatically)
3. Automatical calculation of the corrections (new calibration values) by the system.

3. Colour and density corrections
The colour and density can be corrected by adjusting the Y-M-C-D slides, or by direct input in the range of ±50 D. The colour and density correction setting is not shown on the screen. The correction effect is direct and independent of the material, i.e. for minus yellow the yellow image content is reduced.

4. Contrast correction
Optionally the contrast can also be corrected in colour (YMC) and density (D). The required contrast correction can be made by means of pre-set or customer-set contrast curves.

5. The printing queue
The Durst Lambda 130 has a queue feature for efficient and fast operation. This allows the operator to prepare and automatically expose the jobs. All the queued jobs can be automatically sorted by paper width and type. The image file placed last in the queue always comes first. The remaining length is calculated and displayed for each single job, taking the previous jobs into account.
Single-beam, three-colour (RGB) laser imager system

The digital image information controls the blue, green and red colours of the three lasers, which are merged into one beam. This single beam simultaneously exposes all three layers (yellow, magenta and cyan) on the photo-material, and so produces the latent image in one pass.

No reciprocity failure
The Durst Lambda 130 gets rid of the familiar problem of reciprocity failure when the magnification and exposure time are changed. Since the exposure time and the distance between the laser light source and the paper are always the same, regardless of the material and magnification, the reciprocity effect does not occur.

Advantages of the photographic media:

- High image quality (resolution, contrast range, image sharpness, trueness of color, brilliance, etc.).
- High processing speed, especially important when doing large print sizes or print runs.
- Wide selection of materials (reflection/transmission: glossy, matte, Duratrans, Duraclear, etc.) and large selection of print sizes.
- Proven and mature technology assuring a troublefree print production with high sizing precision.
- Low material costs.
- Troublefree finishing (laminating, mounting, etc.).
Advantages of the direct large format printing to photographic media

Adantages vs conventional enlarging method:

- Digital imaging can be used to its full advantages (colored text without grain, white areas, D-Max, direct control to final print in terms of color and contrast corrections).
- Produces prints with increased details since there is no grain or screen (especially important with very fine structures).
- Increased image sharpness especially with text.
- Allows for over-printing of text in any desired color.
- White areas or white text always remain white independently from the image density (exposure).
- Higher image quality due to contrast control in color and density.
- No more problems with dust and Newton rings (especially important with reversal paper).
- Eliminates the need/creation of a negative/internegative or transparency (needed for printing only).
- Increased productivity and automated operation (automated roll to roll exposure from the queue).
- Less space requirement and operation at full daylight.

Adantages vs alternate technologies:

- Higher image quality due to silver halide technology and continuous tone exposing technology w/o the need of any screen.
- Large selection of media (reflective, backlit, different surfaces, widths etc.).
- Full continuous tone printing capability allowing very clean continuous tonal changes.
- Homogeneous areas (no screens or grain).
- No artifacts such as moiré etc. (increased image details since no screen).
- Does not require any special room climate (+15°C to +30°C / +59°F to +86°F and 25-80% relative humidity).
Flexibility

RGB-TIFF files (24 bit)

PostScript Level 2 / graphics - text files

PostScript Level 2 / image and text files
On-the-fly interpolation
The image files loaded on the hard disk are automatically scaled (enlarged or reduced by interpolation) according to the print size selected and without the need to create a second file according to the output size from the smallest print size up to giant enlargements without reciprocity failure.

Image cropping
Any part of the image can be crop-enlarged without postprocessing. A special interpolation procedure recalculates and generates the pixels involved, and so substantially enhances the image quality in comparison to conventional enlargements.

Multiple-Prints Function
For optimum use of the paper width the same image can be exposed several times on to the paper strip. To optimize paper usage the image can be rotated beforehand.

Paneling / Tiling Feature
Print sizes exceeding the maximum paper width are automatically divided into strips and exposed with cut marks. This automatic tiling includes the following options:

- division to match paper width
- all the panels with the same width
- direct input of a required panel width (custom panel width)
- direct input of a required panel length

The exact panel setting can then be modified as needed by the user. The required overlap can be set.
Work Flow

1. Loading image / text files to the local harddisk
   - from Exabyte
   - from SyQuest
   - from DAT
   - from CD-ROM
   - from MO-Disk
   - from Network

2. Open file to be printed
   - rotate image
   - mirror image
   - adjust corrections in color and density
   - enter job name, customer name and order no.

3. Select paper type
   - select paper type from one of the 5 positions of the paper turret

4. Adjust image size
   - print sizes exceeding the max. paper width are automatically divided-up and exposed in panels / sections.
   - enter desired overlap or spacing
   - enter image border and select whether to be calculated internal or external
   - select image border to be printed white or black
   - enter the number of prints per image
   - if required use Multiple Prints Function to use full width of larger paper widths

5. Transfer image to the queue and expose
   - for efficient operation more jobs/images can be transferred to the queue prior to starting the exposure cycle and unattended printing (on the same paper type)

6. Cut paper
   - menu-controlled automatic cutting
   - instead of cutting, additional images/jobs on the same paper type can be printed at this point

7. Remove and process the exposed paper

Final print
Installation Options

Installation option A
Imager mounted trough the wall (Lambda Wallmount => optional), imager and computer in the daylight room and loading gate in the darkroom.

1 - Imager
2 - Computer
3 - Gate to load/unload paper

Installation option B
Imager in the darkroom (room A) and computer in the daylight room (room B)

1 - Imager
2 - Computer
3 - Gate to load/unload paper

Installation option C
Imager and computer in the same room

1 - Imager
2 - Computer
3 - Gate to load/unload paper
Work and data flow

Technical Data

**General Specifications**

- **Power Supply:**
  - 200 VAC ± 10%/−5%, 3 phase/60 Cycles (Japan) or
  - 208 VAC ± 10%, 3 phase/60 Cycles, or
  - 230/400 VAC ± 10%, 3 phase + N/50 Cycles

- **Power Consumption:** max. 6.000 W
- **Max. power consumption:** 10 Amp per phase
- **Socket for room light:** max. 250V AC, 2A
- **Weight:** approx. 1,500 Kg (3,300 lb.)
- **Size:** Width: approx. 240 cm (95 in.), Length: approx. 240 cm (95 in.), Height: approx. 194 cm (77 in.)

**Space Requirements:** approx. 4x4 m (13x13 ft.)

- **Laserclass:** Laserclass I
- **Safety and Standard Specifications:** CE, GS, UL, CSA

**Imaging Specifications**

- **Exposure System:** single beam, 3 laser (RGB) exposure system (Continuous Tone)
- **File Formats:** RGB-TIFF (up to 24 bits), PostScript Level 2 (PS, EPS)
- **Colors:** 16.7 million possible colors
- **Addressable Levels:** 256 levels each RGB
- **Resolutions:** 200 and 400 [in 1998] continuous tone pixels per inch.
- **RIP:** Cheetah by DICE America
- **Linear output speed:** approx. 30 cm/12 in. per minute, equal to approx. 20 prints 100 x130 cm/40 x 50 in. per hour
- **Laser:** Red, Green, Blue

**Paper Transport**

- **Feeding Device:** 5-position paper turret (loading level: approx. 140 cm/55 in.)
- **Take-up Device:** take-up device with automatic paper loading and built-in automatic paper cutter

**Paper Width and Lengths:**

- **Width:**
  - 127.0 cm (50 in.) 50 m (164 ft.)
  - 106.7 cm (42 in.) 50 m (164 ft.)
  - 105.0 cm (41 in.) 50 m (164 ft.)
  - 101.6 cm (40 in.) 30 m (100 ft.)
  - 76.2 cm (30 in.) 30 m (100 ft.)
  - 70.0 cm (27.5 in.) 50 m (164 ft.)
  - 50.8 cm (20 in.) 80 m (163 ft.)

- **Smallest Print Length:** approx. 20 cm (12 in.)
- **Max. Paper Waste:** approx. 20 cm (8 in.)
Image Processor

Image Computer: Digital DEC-Alpha Workstation with Alpha-Riser-Processor

RAM: 64 MByte, intern.
expandable to 256 MB

Hard Disks: 1 x 9 GByte
Optional: 9 GByte external hard disks

Drive: CD-ROM

Operating System: Digital UNIX (64 Bit)

Monitor: 21" color monitor

Graphic Adapter: HX 8 Bit, 256 colors

Network Protocol: TCP/IP, NFS (Network File System)

Interfaces:
- SCSI II
- E-thernet/Fast Ethernet
- AOI-Port
- DEC 423 (Modem)
- RS 232 (for densitometer-online operation)

Environmental Requirements

Maximum Altitude: 2,400 m (8,000 ft)
above sea level

Temperature Range: +15°C to +30°C
(+59°F to 86°F)

Relative Humidity: 25-80%

Heat Load to Room: approx. 350 m3/hour
(approx. 55°C/131°F/3200Kcal)
Image Processor

**Image Computer:** Digital DEC-Alpha Workstation with Alpha-Rise-Processor

**RAM:** 64 MByte, intern. expandable to 256 MB

**Hard Disks:** 1 + 9 GByte

**Optional:** 9 GByte external hard disks

**Drive:** CD-ROM

**Operating System:** Digital UNIX (64 Bit)

**Monitor:** 21" color monitor

**Graphic Adapter:** HX 8 Bit, 256 colors

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The latest technical developments are constantly being incorporated into Durst products. Illustrations and descriptions are therefore subject to modification.

Professional Marketing Services, Inc.
4802 East Ray Road, Suite 2328
Phoenix, Arizona 85044-6417
P: 480-940-5400  F: 480-940-5488
E-mail: pmsi@promarketinc.com
Web Site: www.promarketinc.com