

3M Digital Printing solution for Traffic Signs



Intertraffic 2008

3M Digital Printing solution for Traffic Signs

- Background
- Program Scope
- Production workflow
- Products
- Technologies Comparison
- Business Model



Background :

Traditional Display and Graphics Imaging Technologies

E-cut



Screenprint



Background : 3M D&G Digital Printing strategy history



3M first to introduce digital printing solution in CG industry - Electrostatic

1991

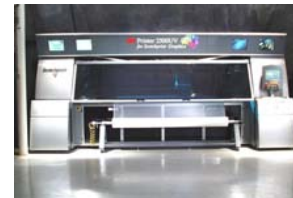


1996



efi | **VUTEK** Inkjet Solvent

2000



Spühl

2003

3M first to introduce digital printing solution in TSS industry – Inkjet UV



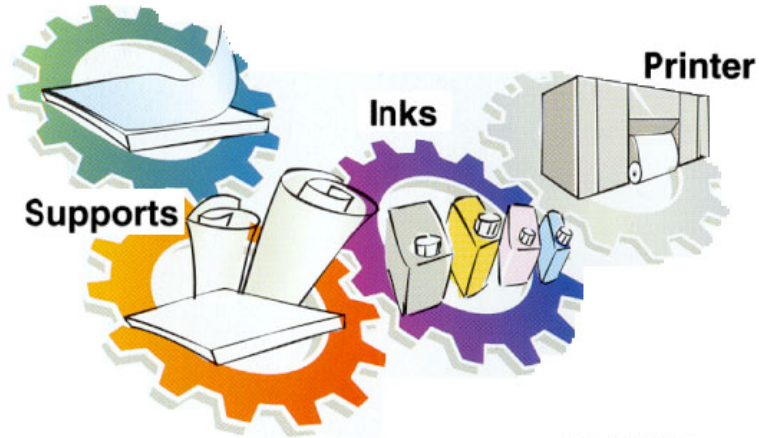
durst

2007

3M

Program Scope : Targets and Timing

Protective laminates



Philosophy 3M™ MCS™ (Matched Component System) is the basis of the quality system 3M that broadens from raw materials to end-product graphics



Program Scopes:

1. Develop TSS durable UV Inks (up to 10 years)
2. Identify/Modify PIJ Printer (UV curable Inks)
3. Match Component System: Printer, Inks, Sheeting
4. Field test : defined within Q3 2007
5. Development and Scale up : Q4 2007
5. Full program launch : within Q1 2008

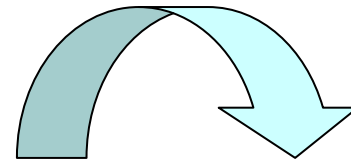


Program Scope : Qualification of 3M UV inks

- Required:
 - Black, Blue, Green, Dark Green, Red, Yellow
- Desired
 - Brown, Orange
- Not Required
 - Purple, Gray

- Including day- and nighttime colors
- Including all European specifications

- Tests started with existing 3M 2700 UV inks from CG (CMYK) inks.
 - Color gamut did not meet requirements.



- Modification of the inks
- **3M PIJ 8800 UV inks for TSS** are no longer CMYK but color requirements are met !!!

Program Scope : Qualification of the printer – Why Durst

- *Leader in UV digital printing*
 - first to introduce UV digital printing
 - first to introduce white ink
- *Local field service activities in place*
- *Rho 160 R project already active with CG*
 - *learning curve experience in place*
 - *established relationship*
 - *Rho 160 R fitted main TSS needs/criterias*



Program Scope : Durst printer, CG and TSS version



durst

Rho 160R Roll to Roll UV Inkjet-Printer

Durst introduces a new, compact high speed roll to roll UV inkjet printer to the market leading Rho range of UV inkjet printers. The Rho 160R is engineered with the same tried and tested technology as other members of the Rho family and offers exceptional productivity, quality and flexibility. Designed for use with both Rho Roll Inks and 3M UV Premium Inks, the Rho 160R provides extremely durable and vibrant images for indoor and outdoor applications, which are covered by an MCS warranty for up to 5 years!



Quadro Array Technology
Durst's own revolutionary Quadro Array printhead technology achieves the combination of the highest productivity with the finest image quality and is featured in all the Durst Rho UV Inkjets.

Advantages of the Rho 160R:

- High output speed – up to 52 m²/hr (560 sq ft/hr)
- 400,000 dpi (addressable)
- Maximum printing width 1575 cm (62 in.)
- Maximum printing length – unlimited
- Integrated Cheetha PostScript RIP
- Durst Rho 160R proprietary user software based on Linux on-the-fly image processing (scaling, pixel interpolation, corrections, cropping, panning, dithering)
- Unattended printing
- Scotchprint® Graphics brand eligibility
- Very good ink adhesion
- High flexibility of the ink and conformability of the inks around rivets and corrugations
- Fast media changing with min. media waste
- 4-color CMYK UV-Inkjet Printing System with Upgrade options for 2 spot colors



- Rho 160 R (CG version)
- Focus on RTR : printing on 3M films, PET, Banners Textile, Semirigid (i.e. polycarbonate), Polyester.
- Up to 600 dpi
- Printing up to body 4 text sharpness
- Up to 60" wide
- Average printing productivity : up to 40 m²/hour
- Unattended printing up to 300 meters roll length

Rho 161 TS (TSS version)

- *As above plus :*
- *Lay flat upgrade*
- *Rewinder unit built in (for proper films lamination)*
- *Web heating upgrade*



MCS Warranty



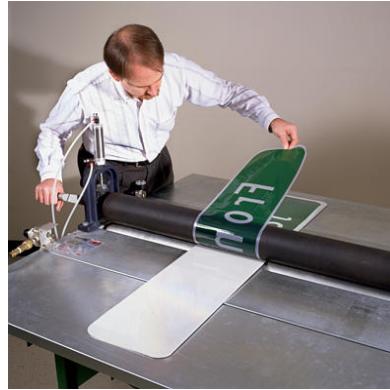
3M™ Matched Component System



- 3M warrants the combination of the specified products, for example: reflective sheetings, ink, overlamine film.
- 3M warrants the finished graphic - not the single product
- 3M offers a warranty, not a durability

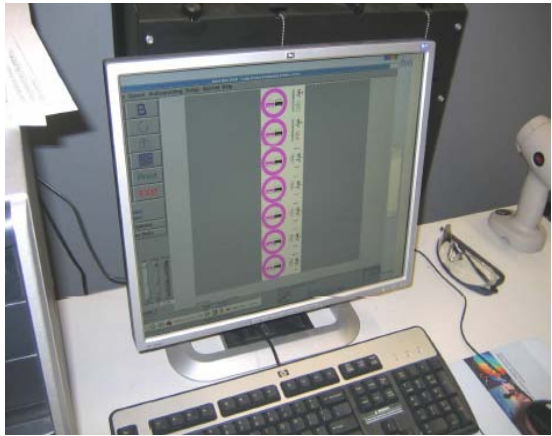


Digital Printing Production Workflow: Traditional Imaging Technologies

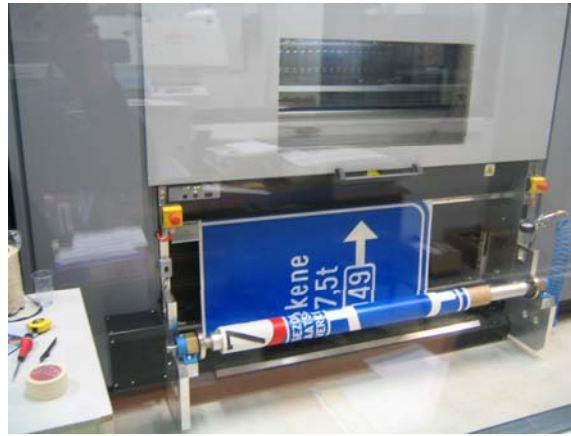


Digital Production Workflow : Concept

Sign Digital Editing via software



Sign Digital Printing



Roll to roll lamination



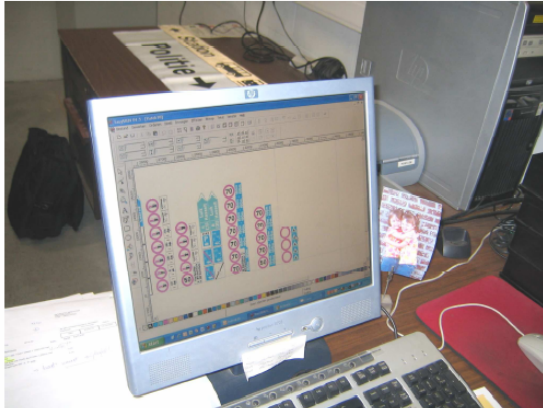
CUAP Class	Table	Sheeting	White	Yellow	Red	Green	Dark Green	Blue	Brown	Optional Orange
R2	Table 7	HIP								
R3A	Table 8 Germany	DG3					NS		NS	
R3B	Table 10 Germany	DG3					NS		NS	
R3B	Table 11 Greece	DG3					NS		NS	NS
R3B	Table 12 Belgium	DG3					NS		NS	NS



Digital Production Workflow – Image Manipulation

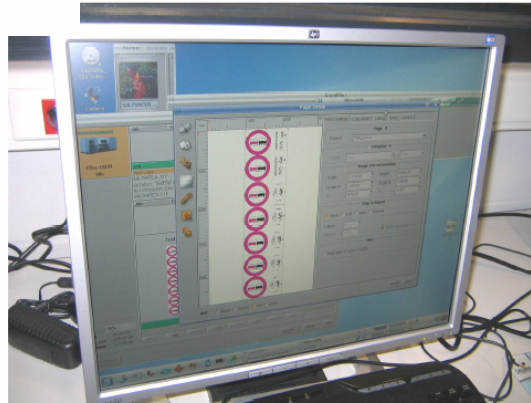
Artwork (Easy Sign)

1.) Layout of to be printed signs are created in Easy Sign pre press software. Compositions of different signs and defined fill levels per colour are predefined here, under optimum nesting conditions.



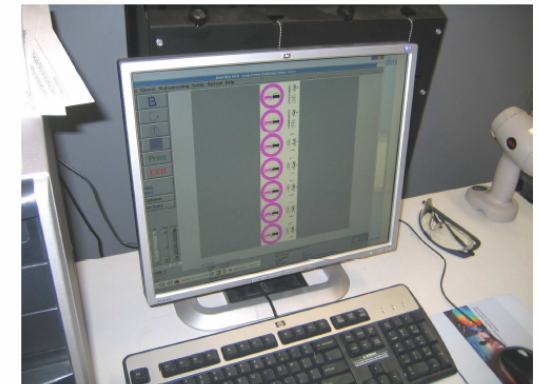
Ripping (Caldera)

ension, resolution and dithering method is determined here. ture data gets converted into printer interpretable data.



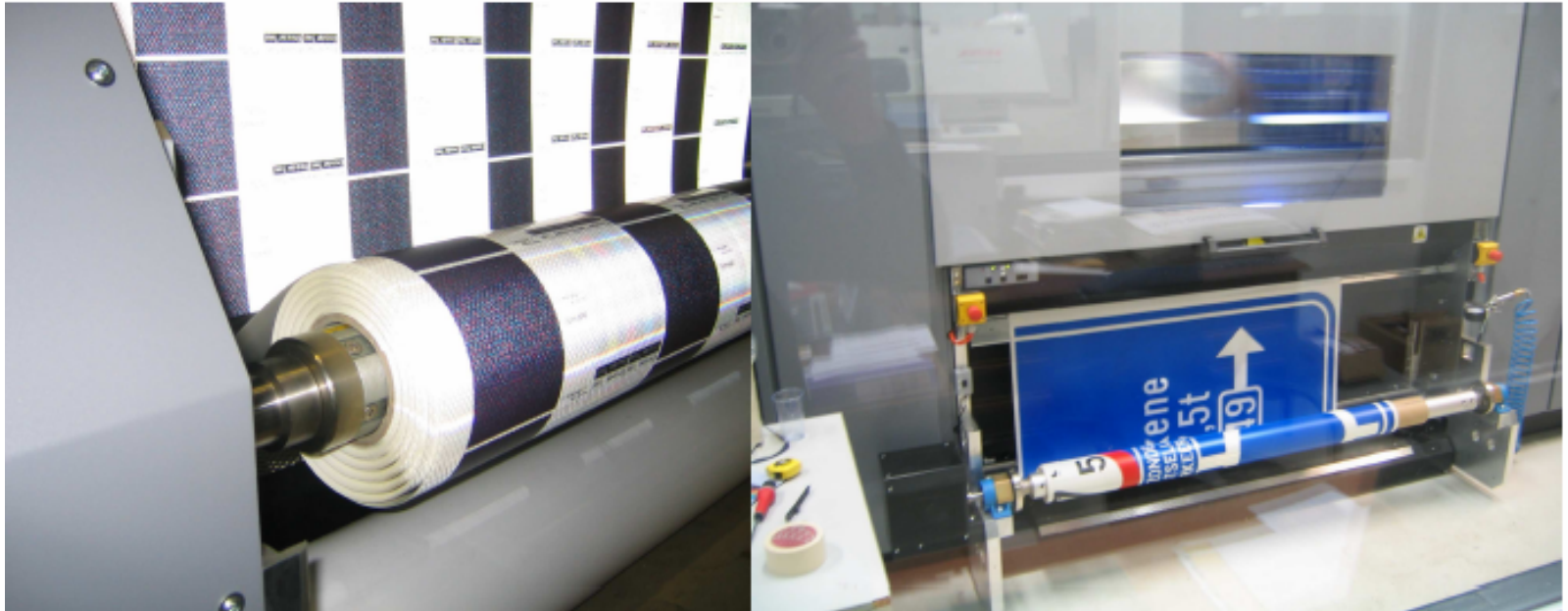
Print Station (Durst Printer Driver)

3.) Number of copies, print mode and curing method are getting defined here. Print process gets controlled from this station.



Digital Production Workflow – Rho 161 TS Printing

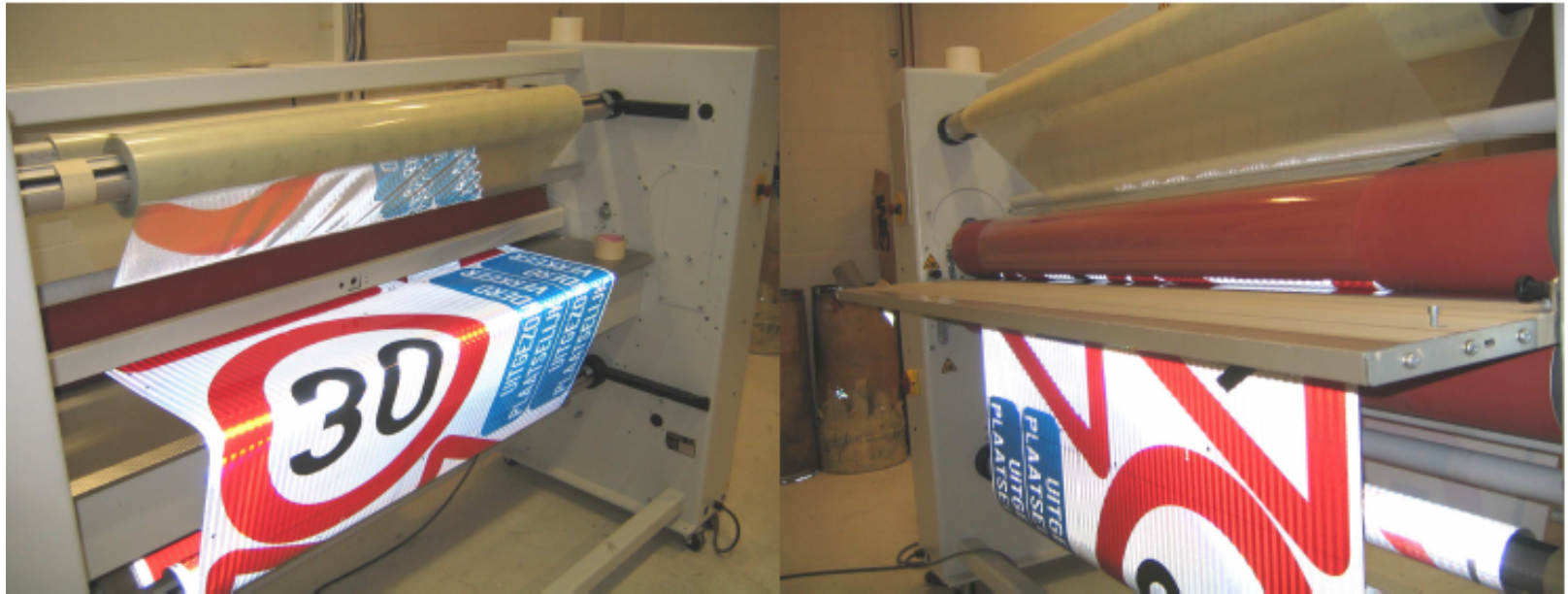
Printing Process



Digital Production Workflow - Lamination

Lamination Process (Crest MLC)

5.) Pressure, speed and applied heat to the top lamination roller need to be adjusted



Digital Production Workflow (optional) – Electronic Cutting

Cutting Process

- 6.) Overlaminated roll gets mounted to plotter cutter. Printed cut marks are detected by I-Cut system and contour of traffic sign will be cut off. Media will be moved automatically to end of plotter table and cut sign can be taken off



3M

Digital Production Workflow - Finished Traffic Sign



3M Products : Qualified Materials



Reflective Sheeting

- Currently, microprismatic sheetings (DG³, HIP)

3M UV inks

- 8800 UV inks series

Overlay Film

- POF 1170 clear laminate

3M Products : Stocknumbers

3MTM Piezo Ink Jet Ink Series 8800UV

<u>Stocknumber (5 liter can)</u>	<u>Product</u>	<u>Color</u>
■ 75-0301-5343-3	8816UV	Cyan
■ 75-0301-5342-5	8814UV	Yellow
■ 75-0301-5344-1	8812UV	Red
■ 75-0301-5345-8	8805UV	Black

3M HIP & DG3 Sheeting

- HIP SEM : DR223920006 – Roll Size : 1.22 x 45.7 m
- DG3 SEM : DR220409004 – Roll Size : 1.22 x 45.7 m

3M 1170 Overlay Film

- 7500108292 – Roll Size : 1.22 x 45.7 m



Technologies Comparison : Expected trends

From

- Inventory
- Labour intensive
- Differences (in production)
- Experience
- Manually driven
- Colors

To

- Print on demand
- Unattended
- Repeatable
- Color editing Digital knowledge
- Digitally driven
- White




Technologies Comparisons : Cycle Time

Existing Traffic Sign production workflow *

Phase/steps

- 1) Image Preparation via software
- 2) DG3/HIP white background applica **NO**
- 3) EC films E-CUT **NO**
- 4) Peeling **NO**
- 5) Appying Application Tape **NO**
- 6) EC films application
- 7) Application Tape removal **NO**
- 8) Sign trimming




Total time needed Company driven

** steps 3 to 7 will be repeated for each colors additional color*

SUV Traffic Sign digital production workflow*

Phase/steps

- 1) Image Preparation via software
- 2) Digital Printing
- 3) Lamination
- 4) Sign Application
- 5) Trimming



Total time needed in minutes **92**

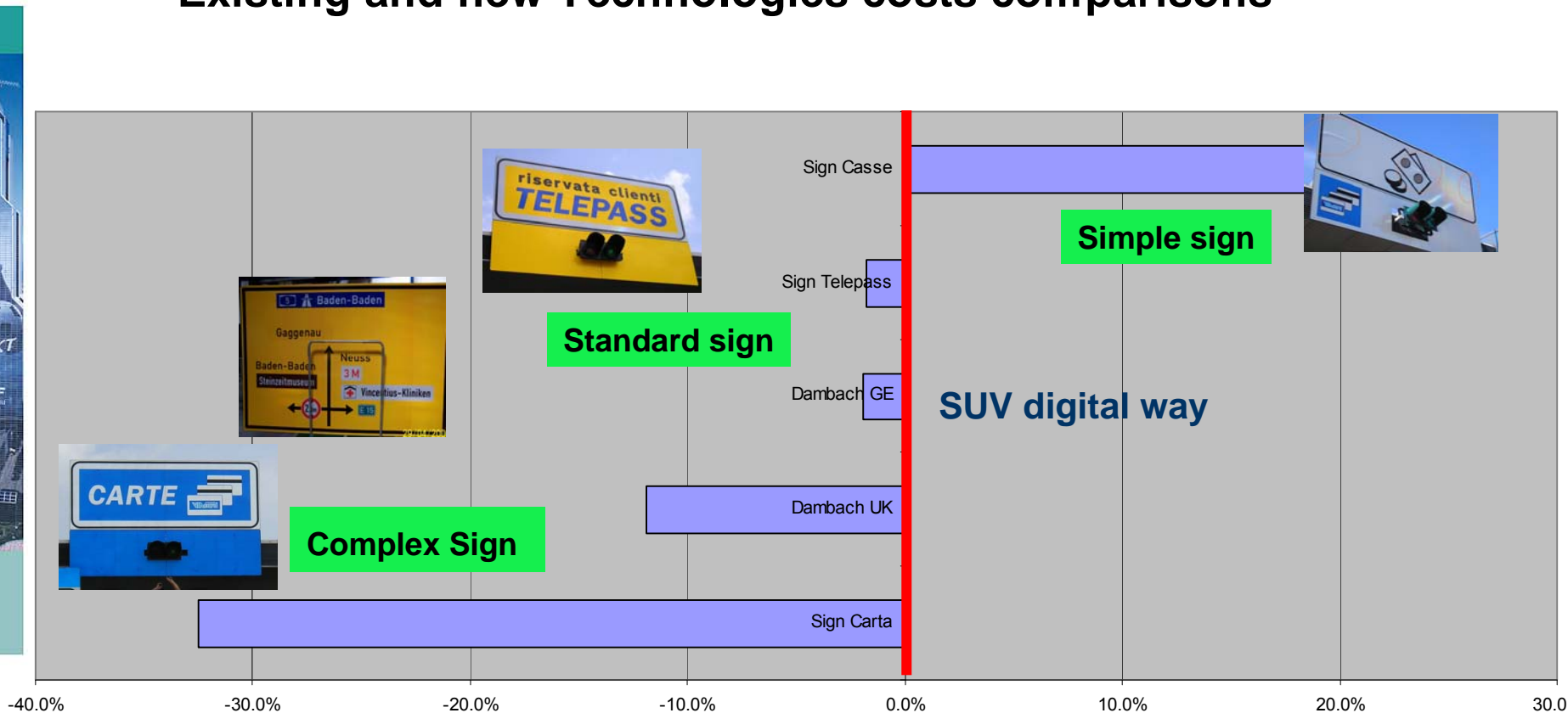
** steps are the same regardless from number of colors*

Cycle time to produce 5 signs (1.2 x 1.8)

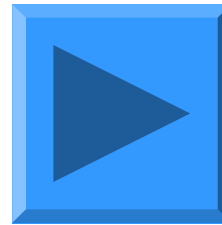


Technologies Comparisons : Economics

Existing and new Technologies costs comparisons



Technologies comparisons : Break Even Analysis & Return on Investment Tools



Business Model : General Rule

- 3M to qualify and approve OEM printer platforms
- 3M will sell reflective sheeting, UV Inks & over-laminates
- Printer supplier will sell printing system, installation, maintenance agreement, spare parts & service.
3M Sub to receive a commission for every printer being sold
- 3M will give a MCS warranty on the finished graphics



Business Model : Durst system and pricing

- Durst system components
 - Rho 161 TS printer
 - Caldera software
 - 12 months warranty including PIJ heads
 - Shipping
 - Basic training and installation at customer site (EU)
- Recommended Durst list price : 355.000 Euro



Business Model : Commission Based

3M sub will get a commission when leads are turned into a sale :

- Leads need to be communicated from 3M sub directly to Durst in writing and/or e-mail.
- 7.25% of the net selling system price is being paid to the 3M sub involved as commission
- Commission will be paid after receipt of full payment of invoice by Durst
- Commission will be paid in the currency indicated in the respective purchase agreement.



Business Model : Durst contacts

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Email: contact@durst.fr www.durst.fr

Kontaktperson: Luc Coruble



Exceptions to the General Rule – Direct System Sales

If a 3M country likes to be involved in systems sales and/or lease, the country has to follow these rules:

- Share proposed Business Model with 3M Europe and receive official approval
- Free up local (technical) resources to co-ordinate the project
- Through EBU/Eurolab, communicate with printer supplier to facilitate installation, maintenance and service
- Involve Local Finance & Legal



Laminator Requirements for Digital Printing of Traffic Signs

- Roll to roll capability
- Supply and take up shaft for rolls of reflective sheeting
- Supply and take up shaft for overlaminate / liner
- Capacity to handle rolls up to 25cm diameter
- Capacity to handle rolls up to 60kg
- Heatable top roller up to 50°C
- Support 3"cores
- Minimum media width: 1400mm
- Required roll pressure $\approx 4\text{N/mm}$



Business model : Crest Laminators

- *In case customer do not already have a suitable laminator the following Crest laminator can be recommended :*
 - *TS 1400 – List price : € 21.000,00 ex works*
- No 3M commission
- Customer purchase directly from Crest



Business Model : Crest Contacts



Home

Company Profile

Products

Service

Contact



How to get in contact with Crest Dutch Machinery

Crest Dutch Machinery B.V.
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8102 GZ RAALTE
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Fax: +31 (0) 572 345059

Direct contact

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email : "Reimert, Jos" j.reimert@crest.nl

Edwin Kruiper – Tech. Mgr
office phone : +31572345050
Email : "Kruiper, Edwin" <e.kruiper@crest.nl>



Feedback from Beta-Site : Janssens / 3M Belgium

- Very Reliable System (Rho 161 TS printer and 8800 UV inks)
- Almost unattended production workflow
- Needs software image manipulation & color editing skills
- Print on demand possibility reduced inventory
- Economics comparisons moved beta-site to apply digital printing also for Police signs vs screenprinting method which was used before the installation of the digital printing system



Message at Intertraffic

Stop Here
and Have a Look
Beyond.

3M

Introducing
the new
3M UV inks
8800 series
for Digital Printing of
Traffic Signs.

- Up to 12 years of warranty
- Flexibility
- Easy to use
- Productivity
- Print on demand
- Reduced cycle time
- Unique solution based on Digital Printing

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- Print on demand



- Thanks

for any questions pls contact :

Marketing : Paolo Pedrazzoli

3M Eurolab : Ralph Gielissen / Richard Lack