EFI VUTEk 3r / 5r
Industrial Production
Roll-to-Roll UV-curing Printer

Dr. Nicholas Hellmuth and Jose Melgar
Factory Visit Evaluation
Initial Comments, Dr. Nicholas Hellmuth

The visit to Matan factory was accomplished by Jose Melgar of FLAAR Reports. He has been to other UV-curing factories over the years, plus of course all the major trade shows. I had to be giving a lecture at Sign Africa and then had to attend Sign Istanbul and SGIA. Plus in between I gave three lectures in several mountain village schools of Guatemala (handing out print samples, material which help both the students and their teachers).

I first visited the factory of VUTEk many years before it was acquired by efi (sophisticated Fiery RIP software). Jose Melgar has been there since. We know Matan since the first days they began to exhibit, plus of course the Fujifilm rebranding of Matan printers. The team of Matan at every trade show was always hospitable. Chady Peter Abed was multilingual, including both Spanish and English, in addition to other languages.

Ten years ago the choices in grand-format signage printers were NUR, Scitex Vision, efi, and Durst. Today there are more Chinese companies with 5-meter UV-curing printers than all other brands together. Several of these Chinese brands are improving their engineering and they definitely have experience from their past models. Thus it is helpful to visit factories and factory demo rooms to check on the expertise of the overall company in addition to the capability of the individual printer models.
Introduction to the EFI VUTEk 3r and 5r

In 2015, Electronics for Imaging (EFI), completed the acquisition of Matan Printers, a wide-format printer manufacturing company based in Israel.

The EFI VUTEk 3r and 5r are the Israeli factory’s first product under the EFI brand. Therefore, these printers inherited the good engineering aspects of the Matan printers, along with the also sophisticated technology, software and market opportunities from EFI.

The following evaluation is based on our visit to the EFI factory in Rosh Ha’ayin, Israel in September 2017.

This is an evaluation of the EFI VUTEk 3r and EFI VUTEk 5r printers. Because it was the 3r which was in the demo room the days I was there, in most cases, we will only mention the VUTEk 3r but all features apply to both models, unless stated otherwise.
1. Brand name, model?
EFI VUTEk 3r and EFI VUTEk 5r.

2. If there are two or three (or more) widths of this printer, what differences exist other than the width?
The VUTEk 3r is not a prototype, but an evolution of previous tried and true models.

The 3r can handle up to two rolls simultaneously, whereas the 5r is capable of handling up to three rolls at a time. The 3.5m and 5.2 print width allow you to handle 1.6 meter rolls. Not every competitor can handle rolls this size.

One of the features that set the 3r apart, is its true ability to handle rigid boards.

This makes the printer one of the few grand-format roll-to-roll printers with a serious, sturdy, wide-format flatbed mechanism.

3. What other printers are the same or similar chassis from this manufacturer or distributor?
The EFI Quantum is based on the same chassis, model 3r is the model which has the the upgrades implemented.

4. How does this model compare with comparable previous printers?
One of the main differences between the 3r and previous EFI VUTEk models is its improved printing speed. Another main aspect is that, in spite of being a dedicated roll-to-roll, it is capable of handling rigid boards up to 3 meters wide.

A previous model is the EFI VUTEk QS3250r. Years later, EFI launched the EFI VUTEk GS5000r.

The following charts describe the differences:

<table>
<thead>
<tr>
<th></th>
<th>EFI VUTEk QS3250r</th>
<th>EFI VUTEk 3r</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Print width</strong></td>
<td>126” (3.2 m)</td>
<td>138” (3.5 m)</td>
</tr>
<tr>
<td><strong>Simultaneous roll capability</strong></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Print resolution</strong></td>
<td>Up to 1080 dpi</td>
<td>Up to 1200 dpi</td>
</tr>
<tr>
<td><strong>Print speed</strong></td>
<td>Up to 172 sqm/h</td>
<td>Up to 380 sqm/h (4,090 sqft/hr)</td>
</tr>
<tr>
<td><strong>Print thickness</strong></td>
<td>0.125”</td>
<td>0.43”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>EFI VUTEk GS5000r</th>
<th>EFI VUTEk 5r</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Print width</strong></td>
<td>204” (5.18 m)</td>
<td>198” (5 m)</td>
</tr>
<tr>
<td><strong>Simultaneous roll capability</strong></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Print resolution</strong></td>
<td>Up to 1000 dpi</td>
<td>Up to 1200 dpi</td>
</tr>
<tr>
<td><strong>Print speed</strong></td>
<td>Up to 260 sqm/h</td>
<td>Up to 460 sqm/h (4,951 sqft/hr)</td>
</tr>
<tr>
<td><strong>Print thickness</strong></td>
<td>0.25”</td>
<td>0.43”</td>
</tr>
</tbody>
</table>
5. What is the nature of the company? Is this company the manufacturer, distributor, or rebranding a machine made by someone else?
EFI is the manufacturer. These models are manufactured in the factory that used to be part of Matan, an experienced printer manufacturer acquired by EFI recently.

6. Is this same model(s) rebranded and sold under other names?
No. This printer is not rebranded to be sold by other company. As stated earlier, this printer is a new improved concept born under the Matan-EFI fusion, and it is sold exclusively by EFI.

However, the previous generation of roll-to-roll printers manufactured in the Matan factory are rebranded by Fujifilm.

But in practice, Fujifilm USA doesn’t have any webpage for the UVStar, and it is difficult to imagine that Fujifilm finds a region to sell that is not covered by EFI.

The printer does appear featured in the Fujifilm Europe website, however.

7. What other printers of other brands are comparable?
Now that HP no longer manufactures roll-to-roll UV printers, and WP Digital is defunct, the only comparable printers in this range are the Durst Rho 312R and Rho 500R.

We have seen a number of Chinese printer manufacturers launching 5-meter roll-to-roll UV printers, but the status of those models is unclear.

8. When and where was this model first introduced?
Some sources mention these models were introduced in FESPA Hamburg, in 2017, but we saw it months before at ISA 2017.
9. Is this printer mature or still in alpha-stage or beta-stage?
Because this printer is based on the concept of an existing printer, the development stages of this printer didn’t take much time.

EFI Israel is already shipping this printer around the world.

10. Is there enough new on this printer to make it worthwhile buying it if I already have another recent model?
Yes. Besides the advantages in the core model, EFI has a number of optional features that speed up productivity.

Purchasing: Cost (true, complete cost, learning the hidden extras)

11. List price?
The engineers at EFI designed these models to be printers à la carte, which means the final price will depend on the options and accessories required by the customer.

This is a high-end printer, so you should expect a price above the US$300,000, but again, the final price will vary depending on several factors, like region, optional features, etc.
12. What other costs are involved?
There are a number of aspects that need to be covered by the customer for the installation. These costs are detailed in the "Installation" section.

13. Does a complete set of full-sized ink containers come with the new printer, or merely a "starter set" that is not as full as a regular set?
Yes. The printer comes with a full 5-liter container per color.

14. What other equipment is needed to operate this printer? For example, does this printer include its own power line conditioner?
There is not much equipment needed to operate the printer. However, the EFI 3r/5r has a series of optional features, which we will cover in the following pages.

15. Do you need an uninterruptible power supply (UPS)?
Yes, the manufacturer recommends installing a UPS unit suitable for the printer’s power consumption.

As is the case with personal computers, a UPS enables you to save your current work in case of a spike in electricity or a power cut.

16. Is an air suction system needed to be installed as a separate item, or is all the vacuum table or other vacuum requirements already included in the printer itself?
The EFI VUTEk 3r printer is a dedicated roll-to-roll printer. The vacuum system comes installed when you buy the version that comes with the accessory tables.

17. Is it recommended, or required, to buy a spare parts kit? Or extra printheads?
It is not required. This printer was designed to work 24/7, and after the installation has been finished, the probability of a malfunction is very low.

Of course, the possibility of a problem will never be zero, and the customer can buy a spare parts kit just in case.

18. How does the total cost compare with other UV printers?
The EFI VUTEk 3r and its serious competitors, are all in the high-end price range.
In general, it is difficult to learn the actual price of a high-end printer for several reasons, unless you are a potential buyer.

With some manufacturers, even if you are a potential buyer, you won’t always get the price before you fly to their factory and select which model you want to buy.

**PURCHASING**

19. Are distributors national (most companies) or regional (Roland allows a dealer to operate only within a limited regional area)? Does a buyer have any choice in dealers?

EFI has distributors covering specific countries, but in some cases, distributors work within a region (a group of countries).

In other words, the countries that are not covered by a distributor, are covered by the distributor in a neighboring or close country. For example, the EFI distributor in Scandinavia region also covers the Eastern European countries.

20. In what countries are there distributors?

EFI has offices in most major countries. The following chart lists EFI offices by continent:

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<thead>
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</table>

This is the booth of LiDYA, the EFI regional distributor based in Turkey, exhibiting at Sign Istanbul 2017.
SET-UP OF THE PRINTER: PRACTICAL CONSIDERATIONS

21. **What is the delivery time, between the time I order the printer and it is delivered?**

   Delivery time is forecasted. Depending on availability and when the customer buys, a printer can be delivered between one week and a few months. In other words, delivery time depends on several factors.

22. **What are the electrical requirements of this printer? This means, will the building have to be rewired.**

   These are the power requirements for these printers:

<table>
<thead>
<tr>
<th>Input Voltage</th>
<th>3-phase, 400 VAC between phases (±5%), 3 x 32 Amp + N* + GND** (WYE) The input voltage rating must be 230 VAC between N and each phase, 3-phase 3 x 32 Amp, + N + GND, which corresponds to the rating above.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Input Frequency</td>
<td>50/60 Hz ±1%</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>UV LED 1.8 kW/hr – at maximum load. LED Arc 10 kW/hr – at maximum load.</td>
</tr>
<tr>
<td>USA/Japan</td>
<td>A suitable transformer should be used whenever these ratings cannot be matched.</td>
</tr>
</tbody>
</table>

   *N = Neutral
   **GND = Ground
   The RCD (Residual Current Device) must be rated at 40 Amps (per phase), with a leakage current of I – 300 mA.

23. **Do you need to budget installing a ventilation or room exhaust system?**

   Yes, you need to consider the investment in a HVAC (heating, ventilation and air conditioning) system.

   EFI is upfront about the fact that the printer releases harmful substances into the air. This is an honest statement and is rare in the industry.

   The manufacturer recommends performing periodical monitoring of the air quality by a certified technician.

   However, the air pollution in a print shop is normally caused by a number of environmental factors, and not only by the UV-curing printers.

   All UV printers need room ventilation, for everything from ozone to misting ink to general odor. Since each grand format printer uses slightly different ink chemicals and different printheads, each brand and model of printer has their own odor, misting, and comparable issues.

   When we visit printshops, in countries around the world, about 25% of the high-end companies have “clean rooms” for their printers. This obviously is a good solution.

24. **Are there any special temperature or humidity requirements?**

   The temperature should be kept in a range of 20ºC and 29ºC (68ºF – 84.2ºF), and the relative humidity between 50% to 80%.

   Temperature and humidity are indeed crucial, especially humidity. Even more important is that whatever temperature and humidity is present in the work area, that it not vary during the day: cool in morning, hot by 11 am. Hotter by 2 pm.
25. **What about altitude? Some cities such as Guatemala City are at a high altitude?**

Some cities in South America and elsewhere are famous for the problems caused by the altitude they’re located at.

Almost no spec sheet and not even many User Manuals mention anything about altitude. But Guatemala City is about 1500 meters above sea level (which is rather high; there are four volcanoes visible out my window as I write this), and other parts of the world have even higher elevation.

26. **What about dust and cleanliness of the air?**

Dust in the printing environment is an aspect that is often neglected. It is crucial that if a sign shop, that no sanding, sawing, routing, sandblasting, or grinding operations be nearby. The dust and debris from sawing and comparable operations are extremely unhealthy for a UV printer.

In other words, you need to ventilate away more than ozone and ink odors; you need to ventilate away everything else that is already in the printshop environment. Dust causes the printhead nozzles to clog, especially on Toshiba Tec heads (which are not in this 3r or 5r grand format systems).

27. **What is the connectivity? Network, SCSI, FireWire, USB or USB 2, or other?**

The Ethernet cable that connects the RIP station and the printer must be of CAT 6 or higher.

28. **What air pressure is required to be provided to the printer? Is this for a vacuum table, or other purposes (such as ventilation)?**

The printer does need an air supply system, but you need to provide it yourself.

29. **What space is needed to accommodate not only the printer but everything else to make the printer fit into your workflow?**

The *Printer Installation Guide* states you need a minimum of one meter at each side.

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A minimum of 1 meter is required, but considering this is a printer that offers a maximum print width of 3.5 m. (VUTEk 3r) and 5 m. (VUTEk 5r), your workflow will be less stressed is enough space is provided to handle the rolls.
30. Does the printer come in one piece? Does this mean you have to remove a wall to get the printer this size into your office?
Yes, the printer comes in one piece, as you can see in the photo below.

Because the printer is only 200 cm (79") deep crated, it passes through most print business entrance.

31. What is the size and weight of the printer?
The following chart describes the size of both models, in three situations: crated, uncrated and operating.

32. How many boxes arrive?
Everything comes in one crate. If you order the vacuum table and the heavy roll loader, those options come separate.

<table>
<thead>
<tr>
<th></th>
<th>Width (length)</th>
<th>Depth</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EFI VUTEk 3r</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crated</td>
<td>727 cm (286.2&quot;)</td>
<td>200 cm (78.74&quot;)</td>
<td>253 cm (99.6&quot;)</td>
</tr>
<tr>
<td>Uncrated</td>
<td>690 cm (271.65&quot;)</td>
<td>145 cm (57.1&quot;)</td>
<td>210 cm (82.68&quot;)</td>
</tr>
<tr>
<td>Operating</td>
<td>690 cm (271.65&quot;)</td>
<td>130 cm (51.2&quot;)</td>
<td>260 cm (102.36&quot;)</td>
</tr>
<tr>
<td><strong>EFI VUTEk 5r</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Crated</td>
<td>868 cm (341.7&quot;)</td>
<td>200 cm (78.74&quot;)</td>
<td>253 cm (99.6&quot;)</td>
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<tr>
<td>Uncrated</td>
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This is a screen capture of an interesting video that shows the installation of an EFI 5r printer at Indy Imaging, a large print business in Indianapolis, US. As you can see, these models come in one piece.

**INSTALLATION OF THE PRINTER**

33. Realistically, what expenses must you incur for the installation, such as a fork-lift truck or crane to lift the printer off the truck?
The Site Preparation Guide states that the owner is responsible for the costs associated with the delivery of the crated printer from the port of arrival.

In addition, this equipment is needed to unload and unpack the EFI VUTEk 3r/5r printers:

- A crane capable of lifting 7,000 Kg (for the VUTEk 5r) or 5,900 Kg (for the VUTEk 3r).
- Four skates. Each one must have four 360° revolving wheels, capable of moving and maneuvering the printer.
- Four hydraulic toe jacks capable of lifting the printer.
- A heavy-duty electric screwdriver
- Cutters for the nylon straps.
- Two forklifts, or one with a wide pitch between the forks.
34. Does the printer have lifting hooks on the top, or elsewhere?
Yes, this printer has hooks at the bottom.

35. What size and kind of forklift truck do you need? Or do you need a crane?
You will need a forklift truck capable of lifting 6.5 tons, in the case of the VUTEk 3r printer, and 7.7 tons in the case of the VUTEk 5r.

The Site Preparation Guide suggests you could use either a single forklift truck or two.

36. Does the printer have spaces for the forks of a forklift truck to get a balanced hold on the bottom of the printer?
Most sophisticated UV printers of most brands have rectangular brackets built into the underside of the printer, usually both front and back, so you can use a forklift truck.

37. Can you install this printer yourself?
No. The VUTEk 3r/5r are industrial printers and the warranty is active as long as the installation is made by a certified technician sent by EFI.

38. Is installation included in the purchase price?
Yes, installation is included in the purchase price. You can't buy the printer without the certified installation procedure.

39. How many people come for the installation?
One technician. But consider the persons needed to move and help uncrate the printer.

40. How many people are required to lift, move… the printer during installation?
All the installation is done by one field service engineer.

You will need a crane as the one shown in the photo to unload the printer to floor level. You also need to rent one or two forklift trucks (depending on the models available in your area).

INSTALLATION OF THE PRINTER: INSTRUCTIONS & MANUALS

41. How many manuals are available?
There is a Site Preparation Guide and a User's Guide. We have access to these guides for any printer we evaluate but rather obviously we do not publish them. You need to obtain these from EFI.

42. Which manuals are hard-copy? Which manuals are only on CD?
Manuals are in PDF but you can have them printed.
43. Is there a Site Preparation Guide? If so, is it helpful?
Yes, the Site Preparation Guide is a 38-page document with all the details and diagrams needed to install the printer.

44. What is the native language of these guides? Is the translation acceptable?
All the manuals and documentation are written in English.

45. What kind of cut-away drawings or other drawings exist that show the various parts of the printer?
The Site Preparation Guide has 2D diagrams, which are not at scale, as clearly indicated. This document also has photos.

46. Is training included in the purchase price? If so, what kind of training is offered?
Yes EFI provides training included in the purchase price. It is part of the contract. You can’t buy the printer without having it installed by an EFI technician.

Training is divided in two parts:
• System operation and RIP
• Workflow

If the printer operator will not be involved in the workflow, a workflow specialist should also attend the course.

47. Is training necessary?
Yes, training is essential for any UV printer, whether an entry-level machine or high-end. Lack of training, incomplete training, and lack/or of experience are a factor in about a third of the problems that people have with UV printers. Another third is often inadequate cleaning and maintenance by the operator of the ink and printhead system.
48. Is classroom training available?
No, classroom training is not common.

49. Is factory training available?
Yes, training is available in the factory but it is usually not required.

In most cases it is better to do the training on site, because the technician can identify the nuances and actual needs of every print shop.

50. What on-line training is available?
There is no online training. As mentioned before, this printer was designed to be very user friendly. Besides, training is required and included in the purchase price.

If a question or doubt arises in the operator or owner, Tech Support is available by phone.

Fewer than 5% of the UV printer manufacturers offer on-line training.

51. What expenses do you have to pay relative to training? Is training at your site (so you have no transportation costs) or do you have to send your people to be trained at the manufacturer (you have to pay airfare, hotel, and meals)?
Training is given in English. If the printer operator is not fluent in English, the owner should cover the costs of a translator.

52. Between the day the printer arrives, how soon is it realistic to achieve full productivity?
With the EFI VUTEk 3r you achieve full productivity in 3 days or less. In some cases, the operator is able to print actual jobs during installation.
If a printer is mature (and out of beta stage) you can achieve full productivity within a week. The longest time before a printer is really productive is when a printer is still in beta stage when you buy it. It takes a while for the firmware and hardware to be improved and updated.

After speaking with many different printshop owners, what I am learning is that if a printer is cheap and junky you will have constant down time due to the printer breaking down. Several times when we evaluate other printer brands, sign shop owners have told me quite frankly, that it took them several months to achieve full productivity.

I once experienced a UV-curing printer in a print shop in St Louis about 14 or more years ago. Since the printer vibrated and wobbled, the nuts and bolts had a bit of stress. The threads on the bolts were shorn off (since they were cheap junk) and the nut fell onto the floor (or worse, inside the printer’s moving parts).

With the EFI VUTEk 3r Roll-to-Roll UV-curing printer you can achieve full productivity in 3 days or less. You can even print jobs before the installation process is over.

Once several of the bolts came off, whatever part it was holding also fell off. But of course, none of this happens when you invest in a high-end printer such as the EFI VUTEk 3r.

This is why we caution people to beware when a brochure (of a low-cost printer) keeps talking about the EU and Japanese components. First, in the early 2000’s many of these were counterfeit; and second, even when authentic, if the nuts and bolts were so low-bid they could not withstand vibrations, the EU and Japanese components simply fell off.
Vibration and shake happen even on a quarter-million dollar printer: two Gandinnovations models vibrated so much that it was hard to read the monitor (it was shaking so much from the braking and start-up of each pass).

**WARRANTY**

**53. Who provides warranty?**
Warranty is provided by EFI.

**54. How long is the initial warranty?**
The initial warranty is one year long, but there is an extended warranty program.
55. *What is covered by the initial warranty?*
Depending on the region, part of the cost of the printheads is covered by EFI.

With the Extended Service Program, you can have up to two printhead exchanges per year.

56. *What extended warranty is available, and for what cost?*
EFI has an Enhanced Service Program that has three levels:

- **Essential:** Providing three-business-day response.
- **ProActive:** Providing two-business-day response.
- **Critical:** Providing one-business-day response.

With these enhanced programs, you can have a field service engineer for repairs. Labor and travel included. You can have software and hardware updates. Besides, you get priority-level technical support by phone.

Warranty covers most parts of the printer for one year. In some cases even printheads are covered. The VUTEk 3r is a high-end sturdy, high-quality printer. However, you can also buy extended warranty programs.
57. What kind of UV printer is this? Dedicated flatbed; flatbed+roll-to-roll across front; combo transport belt; hybrid (with pinch roller over grit roller); dedicated roll-to-roll.
This is a dedicated roll-to-roll. However, it handles rigid media up to 0.39 in (11 mm thick).

58. What kind and size of roll-up table exists?
EFI has a number of variations of the 3r/5r models, with different table sizes:

- VUTEk 3r/5r
- VUTEk 3r/5r with the flatbed plus tables
- VUTEk 3r/5r with 4’ x 8’ vacuum plate
- VUTEk 3r/5r with 5’ x 10’ vacuum plate
- VUTEk 3r/5r with 3 m x 2 m vacuum plate
- VUTEk 3r/5r with Jumbo Roll Handling System

The accessory table is placed in the rear side. Once the board is printed, it comes back to the table. In other words, you only need one table.
59. How many legs are there in the table? 4-legs? 2-legs? Rollers at bottom of legs?
The accessory table has two legs but as you can see in the photos, there is a frame at the bottom that has wheels at each corner.

So, the table is supported at the four sides.

60. What is the surface of the table? Solid? With spherical rollers? With wheel-rollers?
The surface of the table is solid with holes for the vacuum system.

61. Is front table identical to back table?
The rigid media system is designed to use only one table. Media is fed into the printing area, and once printed, the board is pushed back to the same table. In other words, the EFI VUTEk 3r is designed so that all operation is performed at the front. This prevents the operator from having to go back and forth with every board, which increases productivity.

62. Is the table sturdy? Or made cheap material?
As you can see in the photos, the table is sturdy.
LINING UP FLAT MATERIAL (to help it feed straight)

63. What kinds of raised guide bars (alignment bars) along the side of the table exist? Left or right? How long?

There are no guide bars. Media is aligned by a number of sensors and a camera above of the printing area.

The alignment and registration is made by a camera placed above the print area that reads the registration marks. Based on the image captured, the software makes adjustments to align the media.

The system can also be used for accurate registration on double sided backlit printing.
ROLL-FED

64. How is the roll held at the feeding position? On a spindle or on a saddle?
You can hold the roll with a spindle, or on a saddle.

A saddle is a system of two revolving rollers on the top middle of which the media roll is laid down.

65. If you wish to print textiles is there a platen or accessory which can handle the ink which comes through the fabric?
Yes. There is an absorbing strip of thick cloth that is placed on top of the printing area when printing on textile media or mesh.

HYBRID System, issues with thick media

66. Does the sales brochure or sales rep claim this modified Roll-to-Roll printer can “handle all kinds of thick and rigid material?”
No. EFI is a rather conservative brand in terms of the applications that can be printed with its models.

In other words, there are no claims stating the EFI VUTEk printers are capable of printing exotic applications beyond the signage realm.

Some slippery plastics, smooth-surftaced ceramic tiles, glass, and some metals may need pre-treatment (spraying or other chemical treatment) and may also last longer if given post-printing treatment.

CONSTRUCTION (BUILD QUALITY)

67. What parts of the printer look good and strong
The EFI VUTEk 3r is an industrial printer built to be strong. You can tell by sight this is a sturdy printer.

68. What parts of the printer look a tad flimsy?
I visited the factory and personally witnessed several chassis in the production line. There are no noticeably flimsy parts in the EFI VUTEk 3r.

STRUCTURE: Miscellaneous

69. Does the printer have levels built into the structure of the printer?
I didn't notice any leveling system in the printer.

The only entry-level or mid-range hybrid or combo printer where I have noticed levels actually incorporated into the structure of the printer are the UV-curable printers of Dilli.
You can place the roll on a spindle or on a saddle. Besides, there is an optional jumbo feeder system for heavy rolls of media. This accessory comes with a motor.
When you visit the factory, you get to see how the printers are assembled. You quickly get a sense that this is an industrial printer put together for productivity. There are no cheap materials used in the printers and the overall structure looks sturdy.

70. Does the printer have leveling supports? How many, and how strong?
The EFI VUTEk 3r has a total of 10 leveling supports.
- 4 supports at each module at both ends.
- 2 supports in the middle of the printer.

Leveling any UV printer is crucial. Indeed, a decade ago at the NUR factory, once the structure was leveled in the assembly room, rather than roll it from stage to stage, all construction stages take place with the printer not moving from stall to stall.

71. Does the printer have wheels? How many, and how strong?
No, the printer does not have wheels. If you need to move the printer, you will have to do it with a forklift truck.

For entry level printers it is normal to have wheels to move the printer easily. However, considering the EFI VUTEk 3r weighs more than 4 tons, this is not the kind of printer you would attempt to push to the other corner.

The EFI VUTEk 3r does not have wheels because this size of printer is not meant to be rolled away.
72. How would you describe the design of the printer?
The printer is aesthetically pleasing. It follows the red and dark gray color scheme of the EFI VUTEk printers. The big shiny glass in the front hood gives it a nice look.

You can tell this is an evolution in the history of EFI VUTEk printers.

It helps to have a color which is internationally acceptable. Cute pastels are the style in many countries for many valid historical reasons. But a high-end print shop in Germany will tend to prefer a less “cute” color.

A printer which looks like a jukebox at a 1960’s restaurant, may also be cute at the high end, and a German company may accept a quarter-million dollar jukebox styled UV-curing printer. But (unless I want my print shop customers to think they are in a Steak & Shake or comparable 1960’s diner), I tend to prefer a more internationally acceptable color.

Color is the first impression, so to have your printing facility look professional it helps to have a professional color.

It also helps to avoid fads. You do not need your printer to have a Transformer as a logo (as did the quarter-million dollar AEG printers at FESPA 2015 in Cologne). This printer did not succeed well enough to even establish itself at USA expos. When any company refuses to say whose factory makes their printer, that raises the question of “is there something they might feel embarrassed about?” But since
AEG has not been successful worldwide, it does not make much difference where they are made. This is a shame, since competition always helps.

Another significant feature is that you do not have to look at cheap, out-dated Epson style ink cartridges sticking up. You see these on most Japanese printers (even when they too have abandoned Epson printheads). Lots of Chinese printers use this old system also. To see an awkward Epson ink cartridge sticking out, or worse, sticking up, is the immediate logo of a cheap entry level printer (or a printer still using an antiquated ink deliver system).

**73. Can you easily distinguish which is the “front” and which is the “back?”**
This printer is a bit square, but you can tell which is the front by the position of the monitor and the front hood.

### FEATURES OF THE PRINTER: Vacuum

**74. Is there a vacuum function?**
Yes, there is a vacuum system. The accessory table for rigid media is called “vacuum plate” because it has a suction system. The platen in the printing area also has a vacuum system.

**75. Is the vacuum created by simple fans, or by an air pump?**
The vacuum is created by an external air compressor.

Low-bid printers have simple fans; better systems use an air pump. Nonetheless, many vacuum systems have some good features and a few weak aspects.

**76. In how many sections?**
The vacuum table does not have sections. If you need to print a short board, you need to mask the material down onto the table by hand (with tape). Actually I see most printer booths with a nice Oce Arizona doing the same thing in past years.

Cheap printers have the vacuum in one section all the way across. Better printers have the vacuum in user-definable sections.

If the vacuum is in one long section (without divisions), then if your material is small, your vacuum is sucking against nothing, and wasting it’s sucking power. In this case you have to put some other material to cover over the unused section of the vacuum, so that the sucking power can be available on the smaller piece of material you are trying to print on.

**77. Just Off and On? Or variable?**
Variable. You can adjust the strength of the vacuum.

Off and On capability is adequate for entry-level printer. A good mid-range and all high end machines you should expect to have the capability of variable power for your vacuum.

**78. Can the vacuum be too strong for thin materials, and cause them to deform?**
Since you can adjust the vacuum strength, thin materials should not be an issue. The external air compressor is also used to cool the platen. So there are significantly less chances of damaging thin materials with heat.
Yes, this is an issue on some vacuum systems; this is the sort of issue you will find out only after you have used the printer for a few months. So, before you buy it (before you pay for it), test every single material that you might possibly use, so learn which materials are problematical.

**79. Do you need compressed air for any other aspect of the printer?**

As mentioned before, the air compressor is used for the vacuum, for the negative pressure needed in the printhead carriage and for controlling the temperature of the platen.

It is normal to need an air system from your printshop. For the many brands of flatbed printers you need air for media alignment pins. Each printer has its own needs. Your EFI representative will give you a complete list and explain anything you seek information on.

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**CLEANING & MAINTENANCE NEEDS**

**80. What maintenance procedure is required, and how often?**

You only need to purge and wipe the printheads once a day. With other brands, you need to purge between shifts.

This printer is designed to print 24/7. However, the EFI engineers recommend not to purge more than twice a day.

**81. Where is parking area? Where is service area? Is the service area the same as the parking area?**

All the daily cleaning and service is done at the left.

*Cleaning and maintenance is performed at the left. You open up the hood to access the parking station.*
SAFETY & HEALTH CONCERNS

82. Are there mercury arc lamps or LED curing?
The EFI VUTEk 3r comes with LED lamps. No excess heat from mercury arc lamps that will distort media. EFI became a world leader in evolving to LED curing years before swissqprint or other brands (swissqprint only now is adding an LED curing option).

PRINTHEAD TECHNOLOGY

83. Which printhead brand and model is used? What is the drop size in picoliters?
RICOH Gen 5. This model is capable of producing ink drops as small as 7 picoliters.

84. What are the benefits of this printhead?
The Ricoh Gen 5 offers 600 dpi native resolution. It has 1280 nozzles configured in 4 x 150dpi rows.

85. What are the downsides of this printhead?
Ricoh Gen5 printheads tend to be preferred over earlier Gen4. Only the antiquated ex-Colorsapan HP printers use Gen3. Ricoh Gen5 printheads are used around the world by dozens of different brands.

No printhead is perfect, but we do not hear as many stories about Ricoh Gen5 printhead problems as we hear about Panasonic (which are at entry level) and Toshiba Tec (if there is dust in the printshop).
86. How many printheads per color?
You can have 4 printheads per color in a CMYK ink configuration, or 2 per color if you want CMYK + lights. Obviously you can increase print speeds with 4 heads per color.

87. How many total number of printheads?
You can have up to 16 printheads for colors and two for white ink.

88. Are there two printheads for white, and are they separated so one can print before, and the other after the regular colors have been printed? What is the position of the white printheads relative to the rest?
The printheads for white are located at each end, a few inches away of the array of printheads for CMYK.

89. How much does it cost to replace the printhead?
The cost of a printhead is partially covered during the first year. In the Warranty section (page 12), we discuss the items included in the Enhanced Service Programs.

Some sources have a price for the Ricoh Gen5 printheads of around US$2,200. But again, this is not an official figure, and owners should not try to install the printheads themselves.

90. If you buy all your ink from the distributor, will they repair or replace printheads at no cost?
These types of agreements are possible but depend on every distributor. You can buy the ink from your distributor, or directly from EFI.

PRINTHEAD CARRIAGE and GANTRY

91. Describe the design and construction of the carriage area? Size, shape? What is contained, and where?
The printhead carriage is covered by a cap. If you want to access the printhead area, you have to unscrew the cap.

92. Does the printer use a real Igus or a clone?
The e-chain of the vacuum plate is made by Tsubaki KabelSchlepp, a company based in Germany.
This company doesn't have an e-chain model in its website similar to the one used by the EFI VUTEk 3r in its main print area, but neither do Igus.

But regardless of who manufactures the e-chain, EFI has proven to be a trustworthy manufacturer that does not put cheap parts in its printers.

93. Is there a light inside when you open the hood?
Yes. There is a light along the printing area. About half the mid-range and many high-end UV printers have a fluorescent-type light inside when you open the hood.

There is a light along the printing area when you open the hood.

WHITE Ink & Varnish

94. Are the printheads for white the same model as for the CMYK (or are the printheads for white with a larger picoliter drop size)?
For all colors you have Ricoh Gen5 printheads.

95. Is the white ink placed in a position to make its use quick and easy?
As mentioned earlier, the printheads for white are placed at each end of the printhead array. So you can print white first, or white last.
96. **What kinds of white ink printing can be accomplished?**

You can print the following:

- Base Color
- Overcoat Color
- Fill Color
- Underspot Color
- Overspot Color
- Spot Color
- Three layers
- and Spot Three Layers.

97. **Is varnish available?**

No, varnish is not available. Varnish would make sense in a dedicated flatbed printer.

Varnish in a printer can be a nightmare; plus varnish would make sense in a dedicated flatbed printer.

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**INK Cost**

98. **What kind of ink is used?**

The UV-curable ink is formulated to work on both roll and rigid media. The ink is always the same regardless of the initial configuration, especially because the customer can upgrade to print on rigid at any time.

There are many different kinds of UV-cured ink, depending in large part on what you will be printing on:

- ink only for rigid material;
- ink only for roll-fed material;
- ink which is usable both on rigid and roll-fed;
- ink for thermo-forming.
- Special inks for materials with adhesion issues (Coroplast, etc).

99. **What size containers for new ink? What is cost per container?**

The containers are 5 liters.

100. **What is cost of ink per square meter?**

The ink has a performance of 3 to 4 cents per square foot. Ink cost can vary according to application type, profiles and printing mode.
101. **How much ink does the printer hold?**  
The ink system is designed to hold a minimum amount of ink. In other words, there is only a minimum of ink waste.

102. **If you buy lots of ink is it cheaper per-liter?**  
Yes EFI has a program to sell ink in volume, and the cost per liter is more convenient for the customer.

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**INK Color Gamut**

103. **Which colors print best?**  
Reds, magentas and blues were perfect.

104. **Which colors print iffy?**  
The samples I saw were in general good to excellent. Since we began evaluating wide-format printers in year 2,000, we have found one of the most difficult colors for UV-curing printers is yellow.

While most of the samples featuring human models looked very good, the skin tone of one of the samples looked a bit yellowish, but this is a perception based on plain observation. The level of saturation of this sample could have been on purpose.

I hope to print color test samples at the next ISA or FESPA, which are the upcoming events.
105. Which colors print poorly or not at all?
None of the colors showed a significant issue.

Above: a print sample from the EFI library. The interesting concept of this image is a good way to evaluate color output.

Below, one of the samples of animal drawings from the FLAAR archive.

These print samples have a double purpose: they help us evaluate the color rendering of a wide-format printer, and once the evaluation is written, these material is donated to schools in poor areas in the highlands of Guatemala.
**SURFACE APPEARANCE**

106. **Can you produce full gloss, or only partial gloss, or only satin? Or, is the output matte and rather bland (without pop)?**
Yes, glossy finish is possible but most of the print modes are matte.

107. **Can you produce raised relief appearance (multiple layers of ink to create a Braille-like effect)?**
In theory you can, although this is an application you can find more often in dedicated flatbed printers.

**THE UV CURING LAMPS**

108. **What brand of UV lamp is used?**
Phoseon Technology, a company based in the USA. Previously, EFI used to work with Hönle, but Phoseon had already designed a full LED curing lamp when Hönle was only starting with LED technology.

109. **What kind of cooling is used: Air? Liquid? Or something more sophisticated?**
These lamps are cooled by the water system.

110. **What about light leak?**
The front hood has dark tinted glasses, and there is no light leakage. If you stand close to 90% of the UV-curing printers while printing, you see a flash of light. However, the glass on the hood of the EFI VUTEk 3r is designed to block the UV waves. Nonetheless, it helps to be careful with your eyes. But it is helpful that special glass is being utilized.
ELECTRONICS & Firmware (Software)

111. Where are the electronics made (circuit boards that control various functions)? Japan, Korea, Taiwan, Mainland China, Europe, or USA?
Some of the electronics are made in the USA.

112. Where is the firmware developed (the software that controls the printer)? Japan, Korea, Taiwan, Mainland China, Europe, or USA? Or in-house by own engineers?
In general, some aspects of this printer are manufactured in the USA, and others in Israel.

RIP Software & Printer Software

113. Which RIPS are featured?
Since EFI acquired Matan Digital Printers, all of the machines use Fiery RIP.
But, as stated in the beginning, this printer was designed to be a printer à la carte, so you can order a RIP from another manufacturer.

114. If a RIP is included or part of a package, is it a lite RIP or a full-featured RIP? Can this RIP be updated? Can it run any other printers?
Yes, the RIP is included. You can’t buy the printer without a RIP.

115. What kind of monitor is included with the printer’s computer?
The printer comes with a 22” monitor. One of the nice features of this printer is that you can slide the computer to the center of the printer, to have a more convenient control.

Color Management Features

116. What color management sensors or measuring tools are on-board?
We have evaluated printers that had color management tools built inside, but otherwise this feature is not yet available on most brands of UV-curing wide-format inkjet printers. It is normal to have the color management tools depending on the preferences of the print-shop.

Productivity & ROI (Return on Investment)

117. What productivity claims does the printer manufacturer made?
The website states the productivity of these printers:
- EFI VUTEk 3r: 380m² (4,090 ft²) per hour
- EFI VUTEk 5r: 460m² (4,951 ft²) per hour

118. Can you sell the output at the machine’s fastest output speed or is the quality at that speed not acceptable to most client standards?
Yes. EFI has customers that sell output produced with 1 pass and 2 pass. In other words, the quality of the output of the EFI VUTEk 3r at the fastest print speeds is adequate for most applications.
119. How much time does it take to set-up each new size and shape of rigid printing substrate?
Setting up the table took less than 5 minutes. Once the table is installed, the only time you have to consider is the time it takes you to mask the areas that will not have a piece of rigid media on top.

120. What is the level of productivity, high, medium, low?
As mentioned earlier, this printer was designed to print 24/7. The level of productivity is high.

121. How many of this printer would a shop have to buy to be as productive as the fastest of the UV-curable printers actually available today?
In terms of productivity, EFI manufactures highly efficient printers.

122. Can this printer hold up to two or three shifts per day all week?
Yes. Next to the factory, there is a print shop that is using the printers during 3 shifts, practically non stop.

123. Does this printer have to be turned off to rest between shifts?
No. You only need to perform a cleaning procedure in the mornings, and you are good to go through the day.

A very interesting feature of the EFI VUTEk 3r is the ID backprint, which allows you to print file information on the back of the print job. This feature facilitates each printed piece for a faster shipping and installation. This also eliminates the need of manual labeling.
UPGRADES, Future Improvements?

124. What features have been added, or changed since the printer first appeared?
Since this model was introduced at EFI Connect 2017 in January, a significant upgrade has not been necessary so far.

But upgrades are likely to come in the near future.

Some printers have changed as it evolved through beta stage over an entire year. The downside of having lots of changes is that this means the original printer had inadequate features. But both efi VUTEk and Matan already have years of experience with grand-format UV-curing printers.

125. What features are being added, or changed in the next month or so?
The next iterations of this printer will be focusing on increasing speed.

126. Are upgrades modular, or are you stuck buying a completely separate new printer?
All the options and accessories can be implemented on the base model. In other words, all upgrades are modular.

With early L&P Virtu printers, and with some Gandinnovations UV printers, upgrades were modular. EFI VUTEk also offers modular upgrades on some of their models. But with most other systems, once the company develops a better, or more economical way to do things, they tend to come out with a different model and expect you to buy an entirely new model.
127. Can the operator manage print jobs via the Internet with this printer?
Obviously you don’t want to have a UV-lamp running in your shop while you are guiding the printer via the Internet from home. But it does help if people elsewhere in your office can keep track of the printer from their desks. Whether or not you can check the printer from a remote location has to do with the printer firmware and in some instances which RIP software you use.

128. What is the level of ease of use? Can anyone use this printer or do they have to be trained and certified? What about daily and periodical routine maintenance?
Training is required, and is not optional. Nonetheless, the printer is easy to use.

Using a printer and doing maintenance on a printer are two completely different aspects for the printer operator to handle. The Zünd 215 was probably not inherently more difficult to “use,” but I would not want a minimum-wage employee to try to do maintenance on this this early UV-curing machine without serious training, experience, extreme patience, and dedication.

129. Is the printer user friendly?
Yes, we rate this printer as user friendly. By the level of ease of use, you can tell there are years worth of experience put into this printer. It has been designed to optimize production times, which implies making things easy for the operator.

One of the interesting aspects of the design of this printer is that you can slide the printer from its normal position (far left) towards the center of the printer. This feature prevents the operator from running back and forth to the computer when he needs to make adjustments.
130. What sensors does the printer have?
The printer has a wrinkle detection sensor, a registration sensor, among others.

The more things you have to do by hand, the more time you waste.

The more sensors the printer has, the more costly the machine will be.

131. In the main area for operation, is the machine software based (touch screen), or with physical buttons? Or both?
Both. The printer is operated with a computer. You can change the configuration to work in touch screen mode. But EFI has found that most customers prefer the keyboard mode.

Every manufacturer has their preferences. Some high-end manufacturers have nice touch screen systems, but generally also offer a keyboard too. A backward old-fashioned system is that of the early generation Mimaki flatbed: only a tiny rudimentary LCD screen a few inches high.

132. Is the position of the LCD screen or monitor user-adaptable?
Yes. You can rotate the whole computer base, and you can also slide the position of the computer toward the center.

133. Can the keyboard be moved or is it fixed into the structure of the printer?
Perhaps 30% of the keyboards are movable, but generally the ledge or work area is too small to really allow a keyboard to be moved around much.

134. Where does the operator stand or sit?
The computer is the front side, and the normal position is at the left.

With a few printers the operator is at the feeding side; with other printers the operator is at the output side. Each manufacturer has their reasons for their personal preference. Ideal are the few systems where the work area (namely the computer with its LCD monitor) is on a small table with wheels. This way you can move to wherever you have space in your shop and wherever you find is best for your personal preferences.

135. What aspects of the printer can you operate from behind (the loading area)?
The main task you perform in the rear area is loading media. You also fill the ink tanks at the back.

In case of an emergency, there are emergency stop buttons at both ends of the printer.

Some printers have almost no controls at the “back” (loading area). Other prints have some controls. Some large sophisticated printers have key controls duplicated, so you can activate a feature whether you prefer doing that act from one side or another.

136. What controls are on either end?
It is rare to have any controls at the end of a printer.

137. Can you do unattended printing? For how long? How about overnight?
Yes, in theory you can handle other tasks while the machine is printing.

Experienced operators can operate two printers at a time. However, it is not advisable to be printing and leave the room for hours.

Most print shops would not recommend doing unattended printing when UV lamps are involved, due to fire hazard, or melting some unpleasant material if it got caught under the lamp. Also, unless you have an auto-feeder and auto-stacker at the other end, you could not handle unattended printing of flat rigid material.
As for unattended printing of roll-fed material, again, due to the UV lamps, most print shops would probably not leave the printer on overnight. But if you are doing roll-fed material, even though you can’t load another roll unattended, if you have a reliable printer you can do roll-fed (the one full roll) at night unattended if you are willing to take a risk. Several owners of ColorSpan 72UVR and 72UVX printers have said they let their printers run overnight unattended if necessary. This is not officially recommended, but if you have a large job (for roll-fed material), and if you are the only person available to run the printer, it is done more often than I would have expected. On less reliable models trying to run overnight would result in a mess the next day.

But for printing during the day, while the crew has a coffee break or even a lunch break, most places would keep their printer running.

**138. How many operators or operator assistants does this printer require?**

One operator is enough. However, the accessory table is more easily set up if handled by two persons.

This is especially true for the widest version of the table.

Most 5-m super-wide printers have rolls which are too large to load and unload by one person.

In general, most roll-to-roll UV printers prefer to have two people to load heavy rolls, but otherwise, most roll-to-roll, combo, and hybrid printers can be operated by a single person.

The larger Inca printers work more effectively with two operators. But calculate the cost of having to pay this extra operator. He is working only for loading and unloading. Nowadays several companies make special equipment for moving super-wide rolls of media.

*The EFI VUTEk 3r is designed to be operated by only one person.*

*In some situations it helps to have an assistant, but in general, most of the tasks can be easily performed by one operator.*
COMPARISONS WITH OTHER PRINTERS

139. When people are considering buying this printer, what other printer(s) are they also looking at?
HP withdrew its Expedio roll-to-roll printers. Wyfag Polytype ceased its wide-format printer company. NUR and Scitex stopped making UV-curing printers soon after being bought by latex-focused HP.

There are new brands of mid-range 3-meter and 5-meter roll-to-roll UV-curing printers Made in China, but production wise, these are not at the level of the EFI VUTEk 3r/5r.

So, the only real competitor for the EFI models are those from Durst.

140. What aspects on the other printers may be issues?
Ten years ago, if a UV-curing printer used Spectra heads, it was considered a reliable printer.

But as other printhead brands emerged with improved technology, manufacturers gradually began to move away from the nice Spectra heads.

Durst didn’t. Many of their head arrays are based on Fujifilm Dimatix heads, which can produce 10pl drop sizes, while the Ricoh Gen5 heads in the EFI VUTEk 3r can produce 7pl drops. Of course Fujifilm Dimatix also come out with new models. So far Kyocera printheads are used mainly in textile printers, and for UV-curing printers primarily mid-range flatbed and roll-to-roll models.

141. What aspects of the selected printer help decide in its favor?
The following tables compare the EFI VUTEk 3r and VUTEk 5r against its counterparts from Durst.

<table>
<thead>
<tr>
<th></th>
<th>EFI VUTEk 3r</th>
<th>Durst Rho 312R Plus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print width</td>
<td>138” (3.5 m)</td>
<td>126” (3.2 m)</td>
</tr>
<tr>
<td>Simultaneous roll capability</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Print resolution</td>
<td>Up to 1200 dpi</td>
<td>Up to 1200 dpi</td>
</tr>
<tr>
<td>Print speed</td>
<td>Up to 380 sqm/h (4,090 sqft/hr)</td>
<td>Up to 302 sqm/h (3,251 sqft/hr)</td>
</tr>
<tr>
<td>Print thickness</td>
<td>0.43” (11 mm)</td>
<td>0.07” (2 mm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>EFI VUTEk 3r</th>
<th>Durst Rho 312R Plus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print width</td>
<td>198” (5 m)</td>
<td>198” (5 m)</td>
</tr>
<tr>
<td>Simultaneous roll capability</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Print resolution</td>
<td>Up to 1200 dpi</td>
<td>Up to 1200 dpi</td>
</tr>
<tr>
<td>Print speed</td>
<td>Up to 460 sqm/h (4,951 sqft/hr)</td>
<td>Up to 386 sqm/h (4,154 sqft/hr)</td>
</tr>
<tr>
<td>Print thickness</td>
<td>0.43” (11 mm)</td>
<td>0.07” (2 mm)</td>
</tr>
</tbody>
</table>

As you can see, the 3r has a wider max. print width than the 3-meter printer from Durst. But the more evident difference is in the productivity.

On print resolution, it’s a tie, both brands offering 1200 dpi. However, both EFI VUTEk models print faster than their Durst competitors.
**SUMMARY: Image Quality Issues: Banding**

142. *Is there banding in areas of solid dark colors?*
There is no banding in the samples evaluated during this visit.

Even when the printer examined in the factory was still being calibrated, the print samples did not show any banding issue.

**SUMMARY: Image Quality Issues: General**

143. *Is text sharp or fuzzy? What is the smallest text that you can easily read?*
The smallest text you can print is 4 points.

144. *Is there ink splatter at the edge of solid colors?*
There is no noticeable ink splatter in the samples printed.

*Both the text in the samples, and the file information below the images were clear and spotless, even at small sizes.*
CONCLUSIONS:

Pros
This is perhaps the only industrial grand-format roll-to-roll printer that has a serious system to handle rigid boards.

The flatbed capability was not an afterthought. This option gives you a versatile printer. However, if your requests for rigid applications exceed 40% of your total print jobs, perhaps you should consider a separate flatbed printer.

The print speed is higher than other roll-to-roll UV printers.

The output colors were bright and vibrant in most of the cases, and the print samples showed no signs of banding or other major print issues.

My 19 years experience in the world of wide-format inkjet printing suggests that the significant advantage of an EFI printer is the fact that EFI has more in-house signage software capability than any other printer manufacturer that I know of. Any time there is an independent software company that makes a great project, EFI acquires them.

This means that you get not only a printer, you get a printer where the software is already integrated: web to print software and everything else.

Aspects we are still learning about
Even an Audi, a BMW, or a Mercedes has one or two features which should be mentioned as worthy of future evolution. I have been to the Audi factory and to the BMW factory (courtesy of Durst, many years ago, which used to have their FESPA evening dinner event in the guest space of these frankly educational factories). I am currently evaluating 4WD double-cabin pickup trucks for rough unpaved mountain roads: every brand has several positive aspects yet every brand has one or two features that they could consider changing (hint: Mitsubishi has significantly better engine than Mazda but interior of Mazda is definitely has more places to store near the driver’s seat that you need to carry on a trip). And, much to my surprise, VW Amarok is by far the favorite 4WD pickup truck of all we have tested in three years (Mercedes 4WD pickup is a rebranded Nissan with Mercedes frills).

It would be both unlikely and unrealistic to have any printer with no feature in the “might be evolved in the future” section. When the printer is operating, you can see a flash from the UV-curing lamps. However, as stated earlier, the glass used in the hood is designed to block the UV waves as much as possible. In addition, we can't imagine a situation where the operator is standing in front of the printing area 100% of the time while the EFI VUTEk 3r is printing. Plus, this is LED lighting, not mercury arc lighting.

Comments & Suggestions
These printers were designed with the best aspects of two major printer manufacturers, Matan and EFI, now merged into one company: EFI.

Several aspects of the printer were designed following the goal of an increased productivity. And by what we saw in the factory, this is a highly productive printer.

We usually prefer to also visit a print shop out in the real world. But a factory visit is the best first step. I can say this printer has met the passed the questions of this evaluation. The EFI VUTEk 3r/5r is a good option if you are considering an industrial production, high quality roll-to-roll UV printer.

You can tell these printers were engineered to be easy to use, and to reduce to the minimum the possibility of failures.
Postscript: Factory Visits are helpful

We at FLAAR Reports have been testing and evaluating printers since the late 1990's. Cargo trucks filled with diverse printer brands and models were often lined up in front of our offices at BGSU (Bowling Green State University in Ohio) and at UFM (Universidad Francisco Marroquin in Guatemala City). But since the advances in UV-curing technology it was not realistic to have machines this large and heavy sent to a university to test. Besides every time a university gets a new Dean or new Provost or new President, they change the priorities and available space.

So we found it more realistic to move to our own facilities and do the printer evaluations around the world in print shops and in demo rooms. We have been to the Dilli and DGI factories in Korea; to a dozen factories in China (but not yet to Handtop), to the Oce factory in Canada, many factories in USA and nine times to Durst factories (four times in southern Austria and five times in not far away northern Italy). But all that was many years ago.

Jose Melgar is one of three of us at FLAAR who has experience in UV-curing printer factories around the world. Andres “Mike” Morataya is the third member of the UV-team. Textile printers are evaluated by Maria Renee Ayau and in the past by Dr Nicholas. Cutters factories have been visited by Pablo M. Lee and Dr Nicholas.

Ink factories are done by Pablo and Dr Nicholas together; as are factories for printable media and substrates. We have also been to the headquarters of two RIP software companies (Caldera in France and Wasatch in USA) and barbieri color management company (in northern Italy).

Equally important in a factory visit is experiencing the company culture: what is their focus. For example, when the NUR stock market value was literally down-in-the-dumps I was flown there twice. What I found was that the engineers were totally capable, and the factory was in full production. Clearly the people who pushed the stock price down had never been to their factory and did not know how well NUR knew how to design and manufacturer printers. We wrote FLAAR Reports judging the reality of what we saw: within a few months HP bought NUR (surely based on considerable prior and different sources, but equally clearly they read and understood what FLAAR Reports said about the capability of the team at NUR).

Same with ColorSpan: FLAAR evaluated the ColorSpan factory and printers several times. Yes, their technology was “developmental” but it was correspondingly ahead of anything made in Asia at that time. ColorSpan was purchased by HP to obtain experience with UV-curing printers.

Naturally we visit factories under NDA. But one thing is clear, we don't waste our time visiting a factory if in advance we estimate the product is iffy.