

Print Quality & Color Spectrum Achieved



Konica Minolta Accurio Wide 200
Tested at Printing United 2019, Dallas

There are dozens, scores, of UV-printer brands How do you figure out which has really good print quality?

FLAAR has been evaluating printers since the late 1990's, starting with an Encad 36". They sold so many Encad printers based on our report that other companies noticed the world market moving to Encad.

Circa 2000 another printer brand felt they had a wide-format inkjet of more sophisticated quality than Encad, so they sent us printers to test and evaluate. With funding we set up test centers at two universities (Bowling Green State University in Ohio and Universidad Francisco Marroquin in Guatemala City, Central America). We had 19 people working on this project for five years.

Over the following years we have been flown literally around the world to printer factories (and ink factories, RIP software headquarters, factories of media and substrates). But once UV-curing printers became popular it did not make sense to have them sent to us to test (because they are too large and too heavy). So for recent years we do print tests in the demo rooms of the printer factories: in Canada (Oce), USA (efi and other brands), Israel (Matan and NUR), Korea, Taiwan, mainland China, and Europe.

No trade magazine does this; no university professor does this; FLAAR-REPORTS team is unique in this respect. As a result we have a healthy many-thousands on LinkedIn plus an estimated 700,000 readers of our web page network, per year.

Although most of our printer quality testing is done at the demo room in the headquarters of



The red color of the bromeliad fruit (Aechmea magdalenae, a native relative of pineapple) on the print is as bright as the red shirt of Pedro (the capable gardener who maintains the "jungle" surrounding our office building).

This part of our botanical research garden is adjacent to our front door.

the printer brand, it is often quicker to start by first doing a print test at a trade show. The staff in the Konica Minolta booth at SGIA 2018 and SGIA 2019 (renamed PRINTING United 2019) were helpful and hospitable each year.

After we study the print results, we donate the photographs to the national parks where we took them, or donate the photos to rural schools with Mayan children around the parks. Often at lectures on botany and ecology we give the prints to professors or students who are studying the plants or ecosystems that we are studying deep in the seasonal Neotropical rain forests of Peten, Guatemala.

Why do we dedicate so much staff and research to printer quality?

Having been a Visiting Research Professor of advanced digital imaging at several universities I have noticed that not many universities have inkjet specialists: most universities cover offset printers and screen printing technology. Our heart and soul is in toner printers (desktop and short-run digital presses) and especially in wide-format inkjet printers (for décor, signage, and all aspects of visual communication). So we cover printers not often a focus at universities. In effect our web sites provide information, assistance, and training around the world: so we reach lots more print shops and distributors than if we were at a university.

When we walk the aisles of trade shows in Istanbul, Madrid, Germany, Mexico and across USA, print shop owners and distributors stop us in the aisle to thank us for how our FLAAR-REPORTS have helped them make their buying decisions. Lots of distributors use FLAAR-REPORTS to decide what printers to distribute. Naturally there are expenses involved in the research and publication. But we do not ask for any sales commission (otherwise I would be driving a Ferrari or Bentley; I actually drive a 1995 vehicle in US and have no vehicle in Guatemala). FLAAR is a non-profit research and educational institute. We like to assist printing companies and distributors around the world. The 3700+ LinkedIn contacts are literally from every area of the world (since FLAAR-REPORTS is consultant for Sign Graphics Middle East (SGI Dubai), APPPEXPO (Shanghai), Sign Istanbul, and Sign Africa (co-located with FESPA Africa).

So let's put our two decades of experience and our enthusiasm to testing current brands and models of UV-curing printers.

UV-curing inks (10 years ago) had issues reproducing correct colors

Every year the team of review editors and analysts of FLAAR-REPORTS walk the aisles of printer and visual communication trade shows around the world. I can remember 10 years ago when many UV-curing printer inks could not even reproduce the logo colors of the printer brand (or the colors of the logo of the ink brand).

- Yellows tended to be either dull pale, or too green.
- Greens tended to be too saturated and/or too yellow
- Reds were difficult to achieve at all
- Oranges were an issue.
- Blues and turquoise were so oversaturated you saw only a solid color (with no detail of what object or material had these colors).

The only colors that looked great were:

- people's hair
- people's skin color
- watches and other metallic colors
- most colors of wood

Even in recent years, in booths of low-bid printers (or where no one is taking time to do color profiling or test prints), many of the uninspiring yellows and greens, and unachievable reds, and oversaturated blues were still visible. I could never understand by a company rents an exhibit booth, hauls their printers thousands of miles, and then cranks out incorrect colors.

We recommend to distributors and to printing company owners and managers to look carefully at the colors produced in a trade show booth. That's because these colors are usually not fake manipulated colors (since the printer operators during a trade show understandably don't have time to color profile each image).

At PRINTING United we brought our files in the morning (of the last day) and they kindly did the prints by early afternoon. Even more helpful they did two sets (which makes it possible for us to donate more banners to museums, botanical gardens, schools, and national parks).

Shapes and Colors

This is a banner for schools to put on their wall. We don't have funding to print our school books to donate, so at least we want to get the colors to the classroom. In the future when a short-run digital press is available, we can donate the complete books.

The banner on shapes and colors is written in four languages:

- Spanish
- Q'eqchi', one of the 22 Mayan languages of Guatemala
- Maya Itza, another of the 22 Mayan languages; almost extinct, so we hope to preserve this language
- English

These are the languages spoken in the Peten area of Guatemala. If we are providing educational materials to another part of the country we would have different Mayan languages.

The colors that our illustrators use for the 10 colors plus white and black are random. So "orange" is whatever orange the particular illustrator likes. These colors are for children. In the future we would like to print images of MacBeth ColorChecker, the international standard for digital photographers around the world. Today this is called the ColorChecker® Classic. We would also include the ColorChecker® Digital SG. All of these are from



IDIOMAS

7 VII	8 VIII	9 IX	10 X
Diezete Wajub' Juk even	Ocho Wajxaqib' Waxak Eight	Nueve B'eeleb' B'olon Nine	Diez Lajeeb' Lajun Ten

APRENDE FORMAS Y COLORES EN DISTINTOS IDIOMAS

											
Español Cuadrado Q'eqchi' Kaaxukuut Maya Itza Ingles Square	Español Rectángulo Q'eqchi' Kelkookaaxukuut Maya Itza Ingles Rectangle	Español Triángulo Q'eqchi' Oxukuut Maya Itza Ingles Triangle	Español Círculo Q'eqchi' Kotka/sursu B'ak' Maya Itza Ingles Circle	Español Estrella Q'eqchi' Chaim Ek'il Maya Itza Ingles Star	Español Corazón Q'eqchi' Xch'ool pus-ik'al / tz'u' Maya Itza Ingles Heart	Español Óvalo Q'eqchi' B'aq'b'o Maya Itza Ingles Oval					
											
Español Rojo Q'eqchi' Kaaq Maya Itza Ingles Red	Español Amarillo Q'eqchi' Q'an Maya Itza Ingles Yellow	Español Azul Q'eqchi' Rax Maya Itza Ingles Blue	Español Verde Q'eqchi' Rax Maya Itza Ingles Green	Español Naranja Q'eqchi' Kaaq'a'an Maya Itza Ingles Orange	Español Morado Q'eqchi' Q'eqchi' Maya Itza Ingles Purple	Español Rosado Q'eqchi' Saajkaq Maya Itza Ingles Pink	Español Celeste Q'eqchi' Rax'ol Maya Itza Ingles Light Blue	Español Café Q'eqchi' Saajkaq Kafej Maya Itza Ingles Brown	Español Gris Q'eqchi' Chaacha T'aram-puse'en Maya Itza Ingles Gray	Español Blanco Q'eqchi' Saq Maya Itza Ingles White	Español Negro Q'eqchi' B'ox Maya Itza Ingles Black

X-Rite color management company (they acquired the MacBeth brand and products).

What is important is that the Konica Minolta UV-curing printer and its ink produce the colors that our illustrators selected.

I estimate that 20% to 40% of the best UV-curing printers nowadays can produce acceptable colors. At least the same percent of entry-level, low-end, and low-bid inks and printers produce inaccurate inadequate colors.

And some mid-range printers do okay with some colors but not with others. So far the Konica Minolta printers did well with literally all colors. We look forward to having additional color tests with which to print samples, hopefully at a Konica Minolta demo center.

Colors on Poster of FLAAR Mesoamerica



This poster, printed by the Konica-Minolta-Accurio Wide 200 UV-curing printer, has bright yellow, Neotropical green, and gorgeous deep red of a bromeliad (the red attracts the hummingbird).



Here are the prints from the Konica Minolta printer.

We are holding them on the internal driveway that leads from the street into our office down the hill; since the garden occupies a lot of space you need to drive through it to reach the office building. Since it has rained every day for quite a while everything is deep bright green. The plants with big leaves are Heliconia species (a relative of the banana). Bananas are common here but not native; Heliconia are native. We have more species of Heliconia in our research garden than many botanical gardens.

You see children in our office. We allow mothers to bring their children to work. FLAAR has play areas and play houses and toys for them.

FLAAR Mesoamerica is the division which does research on Neotropical botany, zoology, and ecology in Guatemala.

- www.maya-ethnozoology.org
- www.maya-ethnobotany.org
- www.maya-archaeology.org
- www.digital-photography.org

are our web sites on flora and fauna (read by over half a million people around the world).



Here are the panorama photographs of ecosystems around the shores of Lake Yaxha, Peten, Guatemala.

This is the roof of the garage. The roof of each level is a garden. The office is in the middle of the suburbs (we are not in a rural area whatsoever).



The poster, and series of front-covers (of upcoming publications) shows flowers, birds, and ecosystems that we have located in Parque Nacional Yaxha Nakum Naranjo. Ironically FLAAR was formed in 1969 to map the Mayan pyramids, temples, palaces, and ballcourts of the Yaxha and Nakum sectors of this park. In 2018 the park administrators asked if we could return and photograph the flora and fauna of the park plus prepare material for 14 rural schools which surround the park.

20 years ago you needed a fine art giclee printer to produce an image of this quality (with water-based ink). And normally you needed a dye ink to get this wide a nice color spectrum. But

today, as we enter 2020, you can get fine art photo print quality on the Konica-Minolta-Accurio Wide series of printers (two models; primary difference is their width).

**In addition
to doing scientific
botanical reports
we also write
books for children**



FLAAR has botany students, ecology students, social media team, illustrators, and photographers on staff (in addition to the FLAAR-REPORTS team that do research at printer trade shows around the world). Three of us were at PRINTING United 2019 in Dallas. Two of us will be at Sign Middle East 2020 (SGI 2020, Dubai). Six of us will be at APPPEXPO 2020 in Shanghai. We will also attend FESPA 2020 in Madrid; Sign Istanbul; Sign Africa, and of course ISA 2020 and PRINTING United 2020.



Since we have knowledge and experience with flora and fauna of the rain forests, swamps, rivers, lakes, bogs, savannas, and hill areas of Guatemala, we also prepare books for children. Here are some of the water birds and mammals developed by Nicholas Hellmuth and nicely rendered by the capable university students who work for FLAAR Mesoamerica.

It helps the students learn about the world of wide-format inkjet printing to see these nice prints of their drawings.

RIP Software and Color Management

The RIP software brand was AccurioPro WideDirector workflow software. Notice the word workflow; this means you have software from start-to-finish for printing. This distinguished software is a proven workflow solution for RIP, color management, and also for integrating with cutters and other equipment. Since this was a print quality test at a trade show (and not in a demo room) there was no time to use a spectrophotometer for these test prints. However when we visit the Konica Minolta U.S.A. demo room in the future, we are

interested to study their own Konica Minolta spectrophotometers (Konica Minolta has a whole separate Sensing division) that works with their own controllers and workflow software, along with other software that is inside the printer. Normally you would select an X-Rite and/or barbieri spectrophotometers in your print shop. We have flown to the barbieri factory in northern Italy (same high-tech city as one of the several Durst printer factories). And since X-Rite now has new spectrophotometers, we look forward to testing them during 2020. But now that we have learned about the in-house Konica Minolta spectrophotometers, we will add this to our list of equipment and software to study in their demo room in New Jersey.

Media used for the print tests

The inkjet media used for these print tests, a white photo gloss paper, was frankly better than woven or non-woven materials because the Konica Minolta material does not have a surface pattern that messes up the image. Plus the media they selected is significantly less heavy than PVC vinyl.

Natural Colors of Neotropical Flowers of Guatemala



Since FLAAR (USA) and FLAAR Mesoamerica (Guatemala) have been doing high-resolution botanical photography in Central America for many years we know the colors of

the Neotropical flowers of the biodiverse ecosystems. So our test prints have a wide range of colors, many of which were often unprintable ten years ago.



The colors on the prints here are great; the greens on the print are comparable to the actual green of the plants around us.

This is the roof of the 6th level of the FLAAR office building. Every inch of the outside and the roof of each level are used to grow local native Mayan plants.

At PRINTING United 2019 the colors achieved in in the Konica Minolta booth were impressive. Same for the print samples in the HP booth on the new generation HP latex that can handle thick rigid materials. But we don't have any HP latex print samples of our own high-resolution files so we don't yet have a FLAAR-REPORT on the clearly improved color gamut of the current models of HP latex printers for our 700,000 visitors-per-year.

We look forward to doing color test print samples on efi VUTEK printers. We have not yet sent the files to them, but that is in the planning.

Mimaki just did a comprehensive series of print tests in their EU demo room of FLAAR photographs by Nicholas Hellmuth and also other material from FLAAR-REPORTS. These have been shipped and should arrive shortly, at which point we will issue a report.

It is important that we test different printer brands and models. This way we know which are the ones we can recommend.

These photos show our FLAAR Mesoamerica

and MayanToons teams in the FLAAR Mayan Ethnobotanical Research Garden, in Guatemala City. The background is deep green since this is the height of the annual rainy season (it's been raining every day for several weeks).

Two Printers to choose from

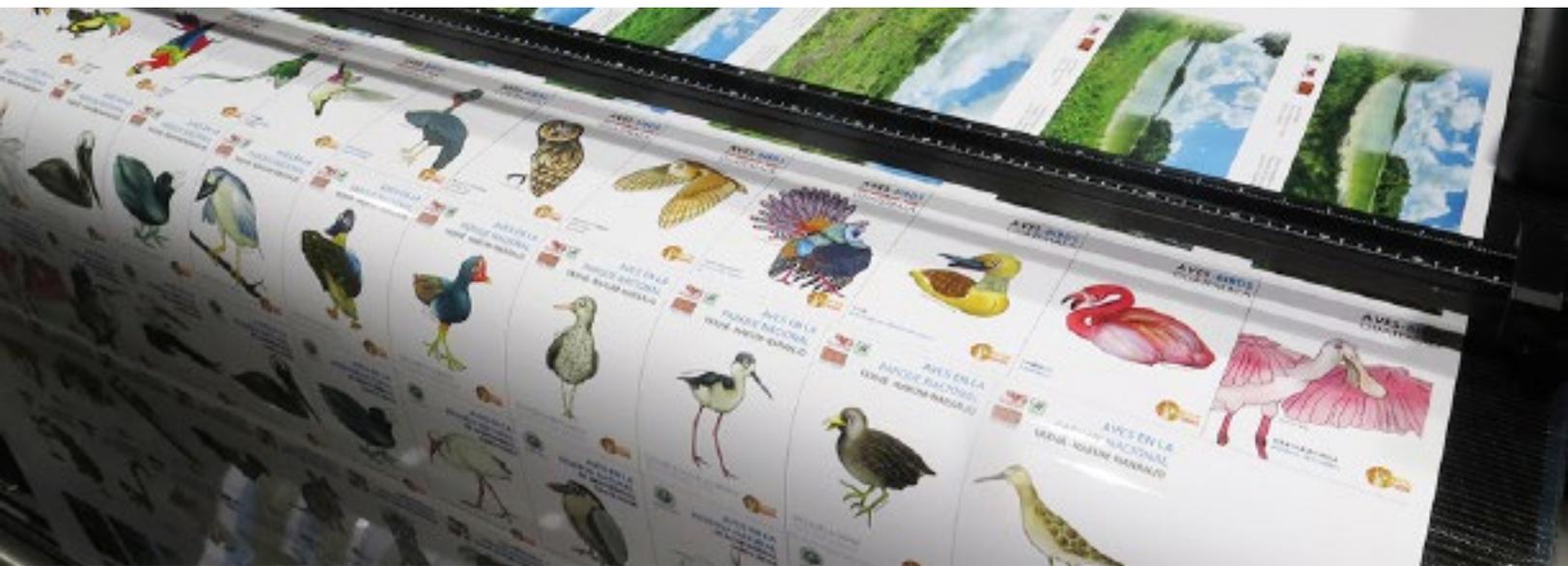
*Last year and this year there were two models:
Konica Minolta Accurio Wide 200
Konica Minolta Accurio Wide 160*

These printers use a transport belt which means you can use roll-to-roll, or, just attach the moveable tables (front and back) and you can print on thick rigid materials.





Here is the print quality



At top are panoramas we take of biodiverse ecosystems in remote parts of the rain forests where no botanist or ecologist has studied.

Across bottom are the drawings of local water birds from the lake in front of the ancient Mayan city-state of Yaxha (Petén, Guatemala). These are the banners that we donate to local schools.

No banding

No banding, not even in areas of solid black color.

So clearly the factory that designs, engineers, and manufacturers these Konica Minolta printers has experience and is interested in precision. In other words, they don't use low-bid components.

Banding is the most common quirk of a wide-format printer (other than inability to achieve a full color spectrum).

So the Konica Minolta Accurio Wide 200 printer can achieve noticeably better-than-average colors and also, no-banding.



Jose Melgar (left) and Dr Nicholas (right) trying to find banding defects. There were no banding lines anywhere whatsoever.



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