

# **MEMS Printheads** **Why have they failed?**

Can **MEMJET** succeed where almost everyone else has Failed?



**The Xante Excelagraphic 4200:**  
**a possible breakthrough for Memjet?**



Front cover photo:  
MEMJET printer at Australia Tradeshow 2011

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## A 42" MEMJET wide-format inkjet printer?

If you spend more than a few minutes searching for Web pages on MEMJET during early September (before Graph Expo), you see they are aiming for a 42" printer. All the info is clearly presented in dozens of PR releases.

But has anyone seen a 42" MEMJET system that actually functions out in the real world?

I recently saw a MEMJET printer that could print ONE INCH WIDE. It was a label printer at the trade shows in Australia earlier this year.

At SignAfrica last week there was another MEMJET printer; probably a few inches wide this time. I have to admit I did not even spend time to go look at it, since the width was insignificant. So to see MEMJET press releases and YouTube claims that they have a 42 inch MEMJET printer, this sounds a tad unrealistic.

I would rather see the ONE-inch printer work before I think about a 42" printer. But since there has now been a new MEMJET printer at two expos, perhaps now is the time to discuss this remarkably hyped concept. And now (September 12th, 2011) that a 42" MEMJET printer was launched as a prototype at Graph Expo, I would like to update this report. This is the Xante Excelagraphic 4200.



MEMJET printer at Australia Tradeshow 2011

## Is all the PR hype about MEMJET just typical PR hype? Or is MEMJET a reliable technology for the future?

If you Google MEMJET MEMS printheads, the title you find is more questions than answers. The question you see is "Is this a Hoax?"

What you don't get on the Internet are what people say privately: one person asked whether all this is a Ponzi scheme! (these are not statements, these are questions being asked).

Either way, all this reminds me of the endless hype about Foveon digital camera sensors about six years ago. Foveon sensors were supposed to change digital photography, yaddi-da, yaddi-da.

Even Hasselblad got suckered in. I can still remember the Photokina meeting with the Hasselblad Foveon team. They served Swedish moose meat taco-like food. And had a stuffed moose or elk as main decoration on their booth.

I dislike slaughtering harmless animals just for tacos at a trade show booth, and felt it was a bit tasteless to exhibit the head and antlers of the source of the lunch. But I will admit that the moose or elk meat tacos were absolutely delicious (I ate eight of them, since everyone else at the meeting was horrified at eating such a noble animal).

But the Foveon sensor was entirely a PR gimmick. Still today Foveon went nowhere fast and only Sigma uses it. The sensor never got any better: it is still today in 2011 stuck at being the lowest resolution digital sensor in the world!

## CrystalJet was another loser: All PR hype

CrystalJet was not a hoax; it was well intentioned. But there was all PR hype and not really an adequate product. There is no FLAAR Report on the CrystalJet since it was so obviously a failure. CrystalJet rose to fame between 1996 and crashed in 1997-1999.

I am speaking of the CrystalJet of a decade ago; the unrelated Chinese brand of CrystalJet is fine. I was at the unrelated CrystalJet headquarters in China earlier this year: they are fully functional (but simply a basic desktop sized printers with a completely normal traditional inkjet system: no relationship to the original CrystalJet whatsoever (other than the mistake of picking a name with an infamous reputation). But the original CrystalJet technology of ten years ago was a failure (except for the PR agencies which had a bonanza).

## The Kodak 5260 was even worse of a loser than Crystaljet

Kodak spent endless millions of dollars promoting their model 5260 printer. The Kodak booth was like a religious revival tent: praising the printer and pumping up the Kodak team. Press releases for MEMJET are sadly the same style: lots of promise, lots of excitement... but no actual results out in the real world (at least not yet).

The Kodak 5260 printer was a complete dud: they could not even get the printer to function for more than an hour in their own booth.

But every trade magazine gave the Kodak 5260 awards, as "Best Printer." Hmmm, how can a printer be the best printer of the year if it can't even function? To this day, the only evaluation of the Kodak 5260 that told the blunt truth is the FLAAR Report. Kodak managers finally used the FLAAR Report to explain to their executives that the printer was hopeless. Kodak apologized to me later.

So it is only a matter of time before pseudo-reviews and sham-reviews hype any new technology. These are pathetic attempts to bamboozle eager people who understandably wish for a faster inkjet printer.

## I hope MEMJET technology is better than CrystalJet and better than Kodak 5260

So I hope MEMJET MEMS printheads for wide-format inkjet are not another Crystaljet. And I hope a wide-format version of the MEMJET can function in the booth of the manufacturer longer than an hour without failing.

But a few interesting questions: Why are only peripheral companies trying to produce MEMJET printers? Why is no mainstream recognized major European or North American brand coming out with a wide-format printer using MEMJET technology?

Why was one of the first MEMJET printer only printing less than one inch in width! This was a label printer that I saw in Australia. If MEMJET is so great, why is it not at A3 size, or at least A4 size?

All their press releases talk about a 42" printer. Not 24", not 36". No, MEMJET itself aims for 42".

## MEMS printhead technology by Dimatix Spectra was not successful

Raster Printers, JETRIX, L&P (Leggitt and Platt), and Yuhan-Kimberly got suckered in and tried to use MEMS heads on their printers.

Raster Printers and JETRIX each lost almost two years of wasted effort (not counting millions of dollars in R&D) to replace the inadequate MEMS heads.

L&P effectively sank and the limp remnants were bought by WP Digital. L&P was sinking anyway, but the error of attempting to use MEMS heads was the final error that caused them to go belly up.

Yuhan-Kimberly's entire textile printer division was flushed down the drain because Keundo was not able to finish a functional printer. Here again, there were plenty of problems before they made the mistake to use MEMS heads, but focusing on MEMS was likely the final straw that ensured the company would be shut down by Kimberly-Clark management.

But MEMS technology failures were three and four years ago. If MEMJET can resolve the issues with MEMS technology, this would be revolutionary. The MEMJET seems to be more a thermal-type printhead. Spectra tends to be a piezo type printhead. Of course MEMS technology itself is unique, so the engineering gets complex quickly. But the first airplanes crashed: the first JET airplanes (the infamous Comet) crashed almost month after month. But the problems were recognized, the engineering was improved, and we all fly on jet airplanes today.

It would be great if MEMJET technology survives early crashes and goes on to become the Boeing and McDonnell-Douglas of the wide-format world.

### **If MEMS printhead technology functions, this will be great....**

We at FLAAR Reports love disruptive technology because it makes everyone need to produce a better printer to compete with the new systems. HP latex ink has been the most important factor in driving innovation in the entire wide-format industry since 2008. The advent of HP latex ink is what caused Canon to attempt to come out with a resin-latex-like printer (shown at several Canon's own dealer network events in 2010).

Mimaki and Roland are trying hard to compete as well. Mutoh was so desperate to make up for sales lost to HP latex ink printers that Mutoh launched a "Bio-Lactite" ink hoping that printshop owners would believe this was a latex substitute (this Mutoh ink was so unpopular that Mutoh's own distributors decline to display or use it in their own trade show booth).

Latex ink is one of the most over-hyped inks of this decade; but its presence has helped generate innovation by competing printhead and ink companies. So even if latex ink itself is not a perfect ink, it has been a great cause of innovation everywhere else.

So we hope MEMS printhead technology will function. But so far there is no adequate documentation. The half-million dollar HP Scitex FB7500 is the only wide-format printer which is currently attempting to use a MEMS-like printhead technology. And even on the sales brochure, they tell you it takes 45 minutes to change a head. Why do they alert you, before they even sell you the printer, that you need to spend 45 minutes to change a head?

That was two years ago; evidently MEMS printhead failures are not as frequent any more. When the first HP Scitex printer came out with MEMS heads, the failure rate was more than 1 printhead every week! But I assume these heads were individual: meaning that you could change a single head (and did not have to change an entire bar of adjacent heads).

What if you have a single-pass assembly, and only a few nozzles fail? Do you have to throw away the entire bar? Or can you replace a section of it? Either way, it sounds expensive (and you can't print x-zillion square meters an hour while the printer is down waiting for a new head).

And who will align the new head?

### **Additional basic questions to ask: will MEMJET function outside a lab; or not?**

CrystalJet functioned in a lab and R&D department.

I will assume that the Kodak 5260 also functioned in an R&D department.

And I sure hope that the Spectra MEMS heads functioned inside their own Dimatix labs before they sold them to Raster Printers, JETRIX, L&P, and Yuhan-Kimberly.

So it is logical to ask this question of MEMJET: what documentation is there that a 36" or 42", or even an A3 width, will function more than a few days or few weeks, if out in a real world printshop.

A few other questions are:

- Will the ink be dye-based only? Or can these MEMS heads handle pigmented ink? (dye is fine for most engineering and CAD drawings in the meantime)
- What computer processor can handle the information required by zillions of printhead nozzles?
- How often do you need to replace a printhead?
- Can an end-user replace the printhead?
- What is the cost of the new printhead(s)?
- How many square meters an hour can you print while you are changing a printhead?

## Comments on the Xante Excelagraphic 4200 in the Xante booth

The owner of MEMJET in Australia is a tough prindividual to evaluate if you read what former employees have to say (admittedly the former employee did indicate he is working on a rival

### I will gladly, and hopefully, eat-crow!

If I can be taken to visit a printshop, out in the real world, that is using a 36" or 42" MEMJET system, week after week, then I will be glad to document that the printer holds up to real-world use for however many weeks it really does.

CrystalJet and the Kodak 5260 are the best examples of the equivalent in the wide-format industry to Foveon in digital photography: complete failure to function outside the laboratory.

Cationic ink is another example. Everyone predicted it would fail (even I watched it fail to function before and during DRUPA 2008). But between Konica Minolta, Toyo, and Gerber, they got Cationic ink to function with tons of investment capital. I have spoken with two owners of these Gerber printers with cationic ink and they were content. Unfortunately Gerber itself dropped this technology, so its tough to tell whether it was because of behind-the-scenes issues with the ink, or simply because there was not enough profit in having the only functional cationic ink system in the world.

So I hope MEMJET functions outside laboratory prototypes. But it will take more than PR releases, and more than pseudo-reviews to convince me.

Will be tough on KIP and Océ toner systems if MEMJET actually functions. But the real question is not just desktop format or mini-labs; the question is whether MEMJET can handle production-class wide-format.

Considering that 2012 is a "DRUPA year" and considering that all the new latex and resin inks are coming out late this year and in 2012, it will be interesting to see if the wide-format industry begins to take MEMJET seriously. I have an open mind, but so far there is nothing that is convincing, since the key is not whether a printer works in a trade show booth, but whether a printer works out in the real world without needing constant replacement of printheads.

## Individuals in charge of the large-format aspect of MEMJET

It is tough to judge the owner of MEMJET because of the employee(s) who have written about him. However one obviously disillusioned and disgruntled employee did admit he was working for a rival technology that would blow-away MEMJET, so it's a challenge to know whether his disgruntled aspect is a grudge, or competition, or whether there is a grain of truth in his comments.

But the President of Memjet Wide Format, Michael Puyot, has a fully adequate background in the world of wide format inkjet technology, does not have the PR handicap of MEMJET in Australia and is a fair spokesperson for the potential of this technology in wide format.

The people in the Xante booth also appear realistic; at Graph Expo I spoke with Arthur Verwey, Vice President, Worldwide Marketing.

Back to the Internet posting of the disgruntled employee, it would also be interesting to see what other technologies can compete with MEMJET. But for now, it is more realistic to focus on MEMJET not some new generation competition which is still in incubation.



Here is the Xante Excelagraphic 4200 with Memjet technology, as a prototype at Graph Expo 2010. This printer, although still under development, should shake up the entire industry. Whether it will function 24-7 out in the real world is the next test. But it's great to see such remarkable technology available to look at.

### **It will be interesting to see how Epson, Konica Minolta, Spectra & Ricoh react**

If MEMJET printheads actually function, it will be interesting to see how all the other printhead manufacturers react.

So this autumn (2011), and year 2012, will produce a steady stream of new ink chemistry and new technology: resin inks everywhere (more than just HP latex ink) and the attempt to get a 42" version of MEMJET single pass technology to function.

### **Historical Footnote**

To learn about CrystalJet fracaso, Google CrystalJet CalComp Lockheed; and as you learn more about the players, Google them: Topaz for example.