

# Directions

Commercial intelligence from ink jet patents

from  
Pivotal Resources



## We read the patents so you don't have to!

You no longer need to read through that pile of ink jet patent applications to find out what your competitors are up to, or what the technology trends are. Subscribe to Directions and receive bi-monthly reports in hard copy for your library and pdf format to circulate internally within your company.

Many of the leading ink jet manufacturers and suppliers subscribe to our service, so why not you? Download a sample copy and see what you've been missing.

- **US, EP & PCT coverage**
- **Bi-monthly reports**
- **Industry news**
- **Reviews of key patents**
- **Printheads & systems**
- **Inks**
- **Media**
- **Full index of all patents**

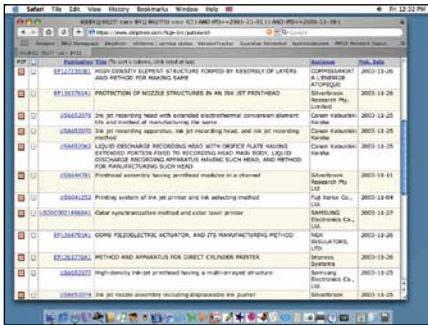
[www.inkjetpatents.com](http://www.inkjetpatents.com)



# What is Directions?

## Is Directions right for you?

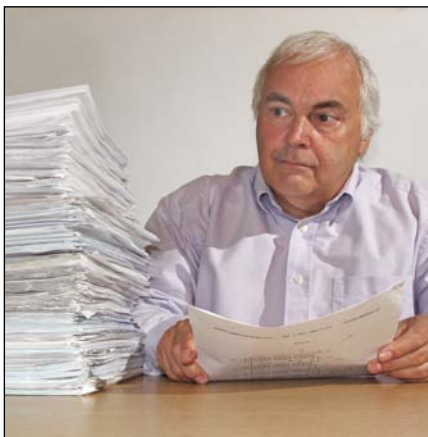
Please watch our video on our web site at [www.inkjetpatents.com](http://www.inkjetpatents.com) to help you decide. It lasts just over 6 minutes and explains all about our unique service.



Most Directions' clients are suppliers to the ink jet printing industry - printer or printhead manufacturers, ink or media developers, or chemical suppliers. Without exception they have staff who monitor competitor patent activity. So why do they subscribe to Directions? Each of our clients have strengths in their own market areas, but our knowledge of the ink jet industry is much broader. Our authors, who select and review the key patents published in each issue of Directions, are experts in their field.

## Preparation of Directions reports

This is the procedure we go through to prepare each issue of the reports. This is explained in more detail on our web site.

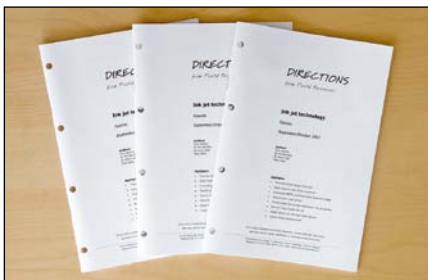


## Patent searching

We carry out a comprehensive search for new ink jet patent applications published by the US Patent Office, European Patent Office or as a PCT. Our searches are broader than just the standard ink jet classifications. We then manually filter out non-ink jet patents. These are then indexed and classified broadly as "materials" patents (relating to ink and media) or "hardware" (everything else). A summary index listing all the ink jet patents we have found is included at the back of each report. We also prepare an Excel spreadsheet with more complete information which is available to subscribers via our web site.

## Patent reviewing

Our patent reviewers then select the key patents for review. This part of the process is run like a newspaper editorial office - we are looking for newsworthy stories. We separate the wheat from the chaff, find new technology, or identify companies who are exploring new areas. Patents are not the most easily absorbed documents, but our experts put the essence of the contents into plain English and, just as importantly, into context. The result is a report that keeps you up to date with new developments in the industry.



## Industry news

Patents can help us tell you what's on the radar screen or even over the horizon. In the front of each report we tell you what's just been announced. Read a summary of newly launched products, from consumer desk-top printers to the largest industrial ink jet printing systems.

**pivotal**  
resources

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## Advancing the ink jet industry

Ink jet technology is becoming recognised as the printing technique of the 21st century, and within the next two decades will displace many of the current technologies for office, commercial printing, packaging printing and even newspapers. In addition it is proving to be the most flexible way of manufacturing displays, printed electronics and even replacement body parts.

Pivotal Resources operates at the forefront of this technology, working for vendors and users world-wide. We assist in defining and reviewing product strategies, support the development of new products and processes, and help our clients gain market position. Our clients are based world-wide and include many familiar names. Among our services and activities are Directions, our ink jet patent review service, and the Ink Jet Academy course.

# How to Subscribe?

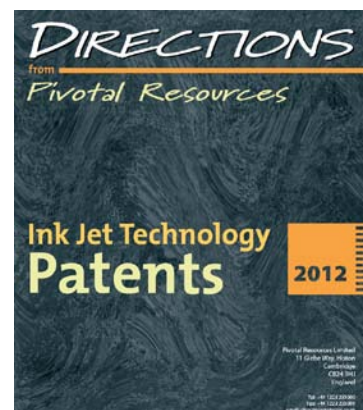
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## Pricing & Order details

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Please send an official purchase order with number and we will invoice you. And don't forget to include all your contact details! All orders and enquiries to:

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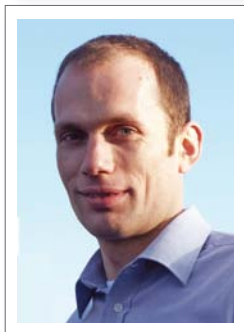
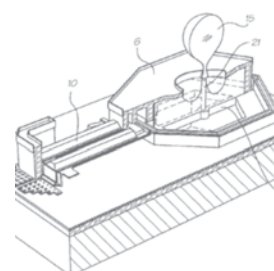


## Directions Authors



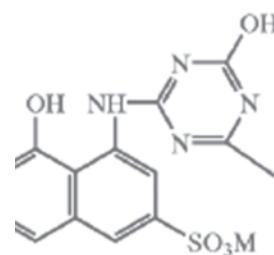
### Mike Willis - Ink jet printheads, systems & applications

Founder of Pivotal Resources and editor and publisher of Directions, Mike has worked on the development of ink jet technology for over 25 years, including the initial research that led to the formation of Xaar. As well as being lead consultant for Pivotal Resources, Mike regularly lectures on ink jet technology, particularly printhead technology, ink supply and nozzle maintenance issues. For Directions Mike carries out the initial patent searching and filtering, and reviews the hardware section which covers printhead technology, drive waveforms, systems issues and applications. He has a BSc in Photographic Sciences from the Polytechnic of Central London.



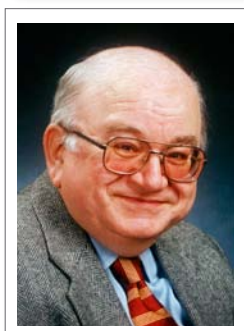
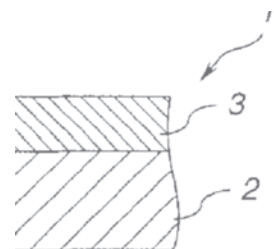
### Dr Phil Bentley - Ink jet ink technology

Phil is responsible for ink jet ink technology patent reviewing for Directions. He is CTO at Conductive Inkjet Technology, responsible for a number of multi-disciplinary projects. Phil has been involved with all forms of ink jet technology, has developed a wide range of products for a variety of "difficult" applications and is the inventor of a direct metal printing technology. He graduated from Loughborough University of Technology in 1995 with a BSc in Chemistry with Polymer Science Technology. Phil has a PhD at Sheffield University, studying the synthesis and characterisation of liquid crystalline electroluminescent polymers for polarised display applications.



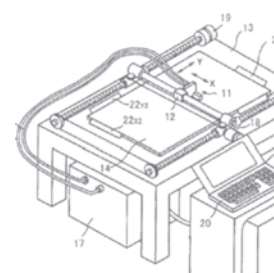
### Dr Clare Conboy - Ink jet media technology

Clare reviews media technology patents for Directions. She is an associate of Pivotal Resources and has long experience with a wide range of digital technologies, working with inks and toners. In particular she has worked for Plastic Logic and Xaar, in both companies formulating inks and media coatings for graphics and thin film electronics applications. Clare has a BSc degree in Chemistry from the University of Liverpool and a PhD in chemistry from the University of Kent researching new ion exchange resins for ion chromatography applied to anions.



### Tom Ashley - Industry news

Tom, President of Pivotal Resources USA, is responsible for the Industry News section of Directions. He has spent more than 35 years in electronic printing and imaging, in research, development, marketing and consultancy. Tom also directed the research and writing of the landmark study "The Future of Paper" and is widely known for his conference speaking. He began his career with IBM developing one of the first ink jet printers. Tom holds an AB degree in Mathematics and Chemistry from Transylvania University and an MS degree in Physical Organic Chemistry from Marshall University, with additional graduate work in management at the University of Kentucky.



# Ink jet patents 2011

The top 20 Ink Jet Patent publishers

2011	2010	Company	No.	%
1	1	Seiko Epson	591	16.4%
2	3	Canon	375	10.4%
3	2	Silverbrook	301	8.4%
4	4	Fujifilm	271	7.5%
5	5	Hewlett-Packard	235	6.5%
6	6	Brother	226	6.3%
7	7	Xerox	150	4.2%
8	8	Eastman Kodak	135	3.8%
9	9	Ricoh	123	3.4%
10	12	Mimaki	72	2.0%
11	19	Toshiba TEC	71	2.0%
12	11	Konica Minolta	49	1.4%
13	10	Samsung	42	1.2%
14	13	Lexmark	37	1.0%
15	22	SII Printek	37	1.0%
16	15	Dupont	31	0.9%
17	20	Agfa-Gevaert	30	0.8%
18	30	Océ	28	0.8%
19	18	Fujifilm Imag. Cols	25	0.7%
20	24	FF Dimatix	24	0.7%
Others			747	20.8%
Total			3600	

In 2011 we recorded 3,600 USAs, EPAs and PCT applications relating to ink jet technology, equivalent to 300 per month. This was 31 more than in 2010, a miniscule 0.8% rise and still below the peak of 4,026 in 2009, which was before the effects of the economic downturn were visible.

As in 2010, Seiko Epson was clearly the most prolific publisher of patent applications, with a 29% increase over the previous year. Canon moved ahead of Silverbrook Research with a 23% increase in applications over 2010, while Silverbrook experienced a 28% fall. Fujifilm Corporation was in fourth place with one less application than in 2010. If all of the Fujifilm companies are counted together, they had 336 patent applications and moved up into 3rd place in front of Silverbrook.

The biggest growth was from Toshiba TEC, up from 28 to 71 patent applications, a 154% increase. Other big increases were recorded by Océ, SII Printek and Mimaki. In fact new entrants this year in the top 20 were SII Printek, Océ and Fujifilm Dimatix, displacing Fuji Xerox, Nippon Kayaku and Videojet.

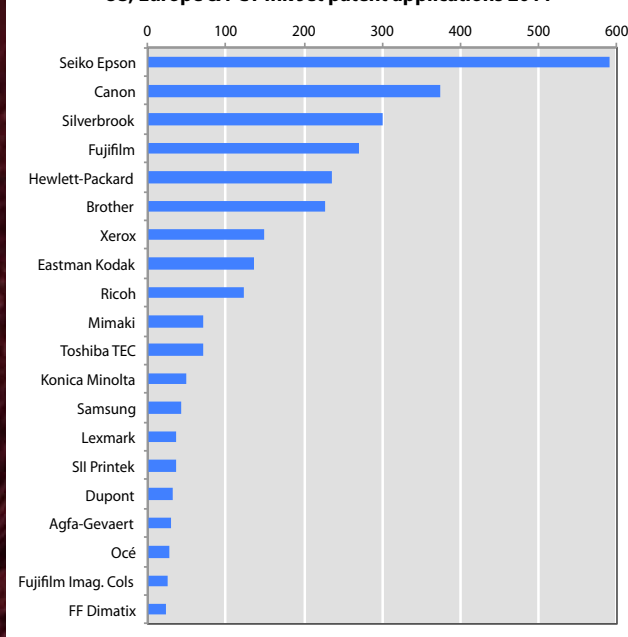
For the first time we are including the top 10 ink jet ink patent scores. Fujifilm easily lead this table with 141, that is 52% of their patent applications are ink related. In second place is Seiko Epson with 83 patent applications, but just 14% of their total.

There is a full league table of all patent applications together with a breakdown of ink patents in the analysis tab of the final patent database for 2011, available to subscribers.

Ink Jet Ink patent applications

	No.	
1	Fujifilm Corporation	141
2	Seiko Epson	83
3	Hewlett-Packard	41
4	Canon Kabushiki Kaisha	35
5	Ricoh Company, Ltd.	30
6	E. I. Du Pont De Nemours	29
7	Xerox Corporation	27
8	Agfa Graphics N.V.	25
9	Fujifilm Imaging Colorants	25
10	Toshiba TEC	22
Others		251
Total		709

US, Europe & PCT Ink Jet patent applications 2011



## Highlights from recent reports

### March/April 2012

- HP's integrated optical drop detection for page arrays
- New piezo printhead designs from SII Printek and Toshiba TEC
- Silverbrook's thermal paddle printhead with drop steering
- Fujifilm's web press with paper seasoning
- Improving heater life with carbon black inks by HP
- Hewlett-Packard's improved white TIJ ink
- Ink jet deposition of adhesive layers by Seiko Epson
- Carestream Health's medical imaging film

### January/February 2012

- HP's ink recirculation technology for thermal ink jet
- Improved manifold damping from Canon
- HP's low cost page array printhead
- Liquid film catcher for Stream from Eastman Kodak
- Intermediate transfer systems from Mitsubishi and Canon
- HP's ink based on liquid toner
- Graphene-based inks for printed electronics
- Carestream Health's medical imaging film

### November/December 2011

- Lexmark's chevron chips for fixed arrays
- More details of Canon's fixed array modules
- Ricoh's variation on Stream CIJ technology
- Novel technologies from Ricoh, BASF and RR Donnelley
- Canon's compact drying system
- Improved UV-curable ink from Sericol
- Seiko Epson's clear ink composition
- Improved media surface coatings from Canon

### September/October 2011

- Fujifilm's Samba head improvements
- Compact piezo MEMS head from Samsung
- Eastman Kodak's Stream waveform for variable speed printing
- Silverbrook's latest printhead wiping system
- Canon's print factory
- Pigment inks with gloss enhancers from Hewlett-Packard
- Du Pont's black ink with high optical density
- Competitive gel coated media from BASF

### July/August 2011

- Canon's high resolution continuous ink jet printhead
- UV-curable inks in the Fujifilm sheet-fed press
- Ink mist collection from Mimaki and Miyakoshi
- Seiko Epson's 3D manufacturing process
- HP's solvent-based inks for TIJ high-speed press
- Improving yellow light-fastness from Canon
- Du Pont's decorative laminated glass

### May/June 2011

- Seiko Epson's lead-free piezo printhead
- In-situ passivation of printheads from Xennia
- Humidified airflow past printheads from Canon
- Canon's transfer drum printer
- Pigment preparation by precipitation from Canon
- Toshiba TEC's emulsion ink
- De-inkable media from Hewlett-Packard

### March/April 2011

- Removing scaffolds from MEMS structures from Silverbrook
- Xerox web press transports and registration control
- Liquid toner ink jet process from Hewlett-Packard
- Ink jet book press from manroland
- Xerox curable inks with thermal initiator
- Solvent inks for TIJ from Independent Ink
- Deinkable paper from Hewlett-Packard