Today's technology is never good enough for us.
I. Quality Based, InkTec

01 High Quality & Nano Technology
Using our own pigment powder dispersion technology, we are capable of manufacturing the stable ink with the pigment dispersion of high solid content. Based on the dye and polymer molecular design and material synthesis technology, the optimized high performance ink is well mixed and manufactured.

02 Wide Range of Selection
InkTec develops and supplies the inkjet technology based dye, pigment, solvent, oil, sublimation, acidic, reactive, and dispersed inks for the different types of the printers from the general office printer to the outdoor use. Furthermore, we are expanding our domain to the next generation technologies such as the digital textile printing, UV curing and electronic material. Since all our products are developed by the well defined system and the state-of-the-art analyzers and lab equipment with focus on compatibility and equivalency with the products from the manufacturers, they are consistent in quality. We can also develop the optimized ink satisfying the customers’ specific requirements.

03 Understanding of the Printing System
We have not only our own ink development technology, but we also have thorough know-how of the printer structure (head and system). Unlike some manufacturers who offer the product by simple blending of the cheap raw material, our support for the printing system as well as ink manufacturing allows us to custom manufacture the ink according to the specification of the printer structure.

04 Intellectual Property Rights
Since the company is founded, we have received over 60 intellectual property rights in ink manufacturing and synthesis, structure, manufacturing equipment and utility models both hear and abroad. Our relentless research and development effort will add more original technologies in ink manufacturing technology and system.

05 Continuous Investment
20% of InkTec’s 250 employees are involved in R&D with an investment of 7-8% of total revenue each year. That helps us to introduced more than 20 new products every year. Our efforts have paid off by the ISO 9001 certification for quality and selection as the Technology Competitive Small to Medium Company by SMBA in 2000. Our lab is also equipped with the state-of-the-art devices such as Weather-0-Meter, XRF(elementary analyzer) and APS analyzer among others to operate the lab customized to the project. Our such active investment on R&D is one of the reasons why people in over 120 countries worldwide are selecting InkTec products.

06 Product Development with Focus on the Consumers and Environment
While we provide the high quality inks at a reasonable price to the consumers, we also aim for protection of environment by recycling the used cartridge. In addition to ISO 14001 certification for environment, our wastewater treatment system that is more strict than the national guideline is just a part of InkTec manufacturing process that puts the consumer and environment at the highest priority. We also actively support the waste cartridge collection campaign by Beautiful Store, a volunteer organization, so that part of our revenue is returned back to the society.
II. Named by InkTec

- **OA ink**
  - Water Based Pigment
  - Water Based Dye
  - Individual
  - Multi-use
  - Mailing

- **LFP ink**
  - Water Based Pigment
  - Water Based Dye
  - Sublimation
  - Solvent
  - Oil
  - UV Curing

- **Textile**
  - Water Based Dye
  - Water Based Pigment

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All these in our production plants and research center are the basic components to keep InkTec as a market leader.
III. Why InkTec Ink

01 InkTec Dye Based Ink

The performance of dye ink can be maximized when using high quality raw material, dye and additives. Since the color and resolution depends on the grade of dye, InkTec uses the best quality raw material to offer the bright and deep colors. The performance also depends on how to compound additives. InkTec has developed over 400 types of inks that can maximize the printout quality based on the intellectual properties as mentioned.

02 InkTec Dye Based Ink for HP

The main function of the latest printers is to print the photo image. Printing natural looking images closes to the picture at a reasonable price will be the main factor for taking the market share. HP, the market leader, is not an exception. The company is actively promoting the photo printer that the general consumers can easily use while producing the professional looking printout. To go along with such market trend, InkTec introduced InkTec Dye Based Ink for HP that is perfectly consistent with HP’s Vivera ink colors. The product offers better chroma than the existing light cyan & light magenta ink to produce the background color that is clearer and richer. Furthermore, addition of the dark gray and light gray in the black domain make it equivalent to HP OEM product to produce natural looking shadow when printing in black and white.

Of course, the rich color presentation of the photo and gray ink can have the highest synergy when combined with the clear presentation of cyan, magenta and yellow inks. In consideration of HP’s thermal head, the high quality raw material is consistently blended. Therefore using InkTec Dye Based Ink for HP hardly damages the thermal head and allows many ink refills as well as steady print quality at high speed.

This InkTec Dye Based Ink for HP is appropriate for high resolution and high speed printer.

02 InkTec Dye Based Ink for Epson

InkTec Dye Based Ink for Epson is optimized for the Epson printer that uses dye ink. The head of the Epson printer is a Piezo type, dispersing the ink by vibrating the ink chamber using Piezo. When the ink containing foam, the vibration may not be properly transmitted and can cause line omission, head clogs and others degrading the printout and head performance. InkTec Dye Based Ink for Epson is designed to remove the foam from selection of the raw material to blending and manufacturing. Especially since the foam can be expanded during vacuum packing, InkTec Dye Based Ink for Epson prevents such risk from the beginning. Using the high quality material allows excellent color presentation and paper support. When the printout is made on a photo paper, it shows almost picture like quality. It is widely used in the photo shop and general office. Having very short drying time, it is ideal for the consumer who wants quick printout or picture.
III. Why InkTec Ink

02 InkTec Pigment Based Ink

The key technology of the pigment ink is to maintain stability after resin coating the pigment particles and dispersing them. Imperfect disperse or unstable ink can cause bending or head clogging during printing. After years of research and development on dispersing technology, InkTec was able to miniaturize the pigment particles up to 80nm (0.08um) for both black and color inks. That results in consistent printing with no damage to the head and uniform absorption of the pigment molecules on the paper to present clear images in high resolution.

01 InkTec pigment based Ink for HP

InkTec pigment based Ink for HP is optimized for Vivora black pigment ink from HP. Using the pigment like the OEM product, it increases durability and lightfastness, and optimization to the HP head structure increases the cartridge and head durability as well. The HP head is thermal type which disperses the ink drop by the vapor bubbles created due to instant high heat applied to the ink in the head. When using improper ink, the ink property can be changed due to high heat or the ink reside can stuck in the heat plate, degrading the head durability and easily causing malfunction. In consideration of such HP head structure, InkTec uses the high quality material and tries to improve the head durability as well as the print quality. The stable dispersing technology used for InkTec pigment based Ink for HP prevents the risk of the pigment molecule precipitation or sticking to the heat plate. It offers clear printout and graphic image. Since the pigment ink is produced by high quality material and precise manufacturing process, it can be used regardless of the packing type, producing clear printout with no penetration or line omission. The product is ideal for the HP printer users.

02 InkTec pigment based Ink for Epson

InkTec pigment based Ink for Epson uses InkTec’s own ‘Nano Coating Technology’ to prevent discoloration for long period. Incorporating double density pigments, InkTec pigment based Ink for Epson produces prints with an extremely wide color gamut allowing the reproduction of colors as originally envisioned at the point of capture. With Photo Black, Matte Black, the ink can perfectly reproduce the rich impression of black and white photo.

Weathering test

To evaluate the resistance of printed output toward the effects of rain and sunlight.

- Instrument : Xenon arc lamp - 0.35W/m2 @ 340nm  ;  Light only, 72 hr  (24h in the machine = a month outside)
- Original printing
  - 3 months later (without laminating)

Furthermore, recognizing that the Epson Piezo head, which uses the electric vibration to disperse the ink, may not perform well if the foams exist in the ink, InkTec pigment based Ink for Epson is designed to be free of the foam from selection of the raw material to blending and manufacturing. Because of the technical difficulties, many ink manufacturers do not offer the pigment ink or only offer the black inks, but InkTec’s InkTec pigment based Ink for Epson is available in all colors based on outstanding dispersing technology and excellent color presentation. This includes the photo colors of red, blue and others that increase color quality of the graphics. If the user wants to print the image that will be kept for long time, InkTec pigment based Ink for Epson is recommended since it offers high durability and lightfastness for the matte paper, glossy paper as well as the multi-purpose papers. InkTec pigment based Ink for Epson is the answer for the high priced printers or professional looking pictures.
The inkjet technology can bring the best print quality when the following three factors are optimized.

The ink must be developed with consideration to the printer head structure and dispersing method since they can affect ink flow, clogging, corrosion and jetability. Furthermore, the condition of the media affects the printout quality in sharpness, penetration rate, dry speed, bleeding, color gamut, optical density, water resistance and lightfastness. Therefore, using the good quality media is as important as using the good ink. InkTec strives to improve the support of the media by using the good quality material as well as application of cutting edge blending and dispersing technology based on precise understanding of the printer head.

As a part of such efforts, the following factors analyzed in research and development of the best ink. All produced ink batches are objectively monitored for quality control. This data is used for our COI (Certification Of Inspection).
IV. Main Factor to Develop Ink

01 Physical Properties

Development of inkjet technology has allowed introduction of high resolution and high speed printers. The inkjet is the method of dispersing 2~5μm ink drops from the micro nozzle in units of μm to the media. If just one nozzle out of hundreds is clogged or improperly sprayed, good print quality cannot be attained. The most critical factor of the inkjet printer is the jet stability and prevention of nozzle clogging. Both of them are highly affected by interaction of the physical properties of the ink. The following physical properties are considered when we design the ink.

02 Conductivity

This property is affected by salts (ions) and organic components (dye) in ionic state in the ink. It represents the purity of the ink.

03 Surface Tension

The surface tension is the force created on the liquid surface as the liquid is exposed to the air and the gravity balance between the liquid molecules are broken. It affects the following print quality:

- J et stability
- Ink flow inside the cartridge and head
- Remanufacturing/ refilling
- Ink cavitation
- Penetration rate and dry speed
- Bleeding and sharpness
- Color gamut
- Formation of meniscus on the nozzle

These factors have major impact on the print quality. InkTec products offer consistent surface tension that is appropriate for each type of head.

04 pH Value

If pH of the ink is too low (acid) or too high (alkali), it can cause corrosion on the materials in the head or the sponge in the cartridge and degrade the chemical stability of the dye in the ink or pigment dispersion. pH values of InkTec inks are in the range that allow stabilization of the ink. They are generally in the weak alkali range.

05 Microfiltration

All inks from InkTec are microfiltered to remove 99.9% of insoluble materials to make it appropriate for the micronozzle. It is one of the reasons to ensure clear colors and outstanding print quality of InkTec inks.

06 Density

It represents weight to volume ratio of the ink. Ink density is calculated by measuring the weight of the ink in a container with the specific volume. InkTec manages this property to maintain consistency and accurate quantity.
02 Printing Properties

The printing quality is affected not only by the ink properties but also the characteristics of the printed media. There is considerable difference in print quality depending on the type and amount of coating even when using the same ink. Therefore, InkTec compares the print quality of the OEM ink and ours for the same type of paper. The optical density is measured to compare the blackness on the specialized and multi-purpose papers. This is an important part of InkTec’s development effort to ensure that the media support is considered as much as the ink properties.

01 Bleed control & Edge Acuity

The ink dispersed from the cartridge nozzle moves to the porous layer on the paper (many small spaces existing between pulps of the paper) through capillary phenomena, and that’s how the ink is absorbed and distributed on the paper. Since the porous layer differs depending on the coating type and amount, the degree of absorption is different even for the same ink. The paper using large amount or special type of coating reduces the contact of the ink with the porous layer and prevents ink bleeding. Considering these characteristics, InkTec performs the ink bleeding test on the various papers. The test includes bleeding between black and color inks and bleeding of black ink alone which is used for the most tests. These thorough tests enable InkTec to introduce the black and color inks that produce clear printout with no bleeding.

02 Color Gamut & Optical Density

The inks from InkTec use different colorant and raw materials from the OEM inks and are optimized by our own design. Color gamut shows the color presentation range. For objective and accurate measurement, InkTec measures the color quality and presentation using L*a*b* values of CIE, the international standard and most widely used. If the measured values are the same, it means the color presentation is equivalent.

- **L-value (Lightness factor)**: This factor shows the lightness and darkness of an object and is measured in the number ranging from 0 to 100. (L=0 means black and L=100 means white.)
- **a-value (Red/Green factor)**: This factor shows redness or greenness of an object. The plus (+) value means the color of an object belongs to the red category while the minus (-) value means the color belongs to green category.
- **b-value (Blue/Yellow factor)**: This factor shows yellowness or blueness of an object. The plus (+) value means the color of an object belongs to the yellow category while the minus (-) value means the color of an object belongs to the blue category.

To compare InkTec’s color with HP’s color on various kinds of media if both inks show similar measurements, it means they have similar color gamut. (*) Instrument: X-rite Spectrodensitometer 530

* CIE : Commission Internationale de l’Eclairage
IV. Main Factor to Develop Ink

**02 Optical Density (OD)**

OD (Optical Density) is a quantification of density of the ink spread on the paper and used for measuring blackness of the black ink. The inks with the same OD value have the equivalent blackness when printed.

InkTec measures LAB & OD values and compares these values with OEM on the various types of papers to develop the most optimum inks for the particular printer.

**03 Penetration Rate & dry speed**

This property checks the time required for the dispersed ink on the media to be dried and is affected by the ability of the media to absorb the ink and the surface tension of the ink. Increasing the penetration rate to speed up drying has the negative side affect of reducing the blackness of the printout. Therefore, it is important to balance between these two. InkTec’s key know-how includes the optimum values of the blackness and penetration rate to satisfy both.

**04 Water Resistance and Lightfastness**

As application of OA printing is getting diverse, water-resistance and lightfastness are required in an increasing number of areas. This has led to an increase in demand for pigment ink and to reinforcement of functions. Due to differences in chemical structures, the pigment is more widely used than the dye because of its superior water-resistance and lightfastness. The pigment ink consists of the pigment particles, and InkTec is very specialized in dispersion technology.

So, pigment particles can be suspended in water at higher concentrations than other pigment inks, and it makes small ink dots when they are jetting out from head. Therefore, we guarantee the long lasting head durability and the wide color gamut.

**Weathering Test**

This test evaluates the resistance of printed output toward the effects of rain and sunlight. As the fading rate is low, the ink is more resistant.

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<thead>
<tr>
<th></th>
<th>MIMAKI</th>
<th>INKTEC</th>
<th>MIMAKI</th>
<th>INKTEC</th>
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<tr>
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<td>Yellow</td>
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*Instruments: Xenon arc lamp - 0.35W/m² @ 340nm

Test spec, In/Out included. 250h (=10 months outside)
IV. Main Factor to Develop Ink

03 Reliability

* Long lasting head durability

The quality of inkjet print image is determined by droplet formation. To ensure neatly printed image, the ink droplets jetted from the head should not leave residual image. To secure jet stability under the various environments, InkTec performs the letter printing, continuous printing, non-clogging and humectancy tests, evaluating how the inks affect the heads and how long the head durability is lasting.

* Since InkTec products are exported to more than 120 countries all over the world, the quality is tested under the following conditions to prevent degradation of the ink during prolong transportation and storage:

  01 Freezing test
  02 High temperature test
  03 Cycling test
  04 Long-term Preservation Test

The optimum condition for ink storage and use is 15°C-35°C(59°F-95°F), and directly light or extreme coldness should be avoided.

04 Health & Safety

The inks from InkTec are made of materials harmless to the human body, and we provide the MSDS (Material Safety Data Sheet) for handling to add safety to the consumers.
All ink batches manufactured by InkTec is managed through objective quality control. We ensure stable quality of the inks by evaluating the pass/failure of each batch by our own criteria. Furthermore, the printing properties, the consideration during the development of new inks, are also tested to check the ink performance, and the physical properties are measured using the precise analyzers and are recorded on COI (Certification of Inspection) which is offered to public. By testing the manufactured inks for the conditions that were already checked during the development, we ensure that our quality system to be complete and thorough.
VI. Test Charts

- Black Ink Bleeding Test
- Drying Test
- Continuous Printing Test (Black)
- Continuous Printing Test (Color)
- Bleeding Test
- Letter Continuous Printing Test
- CMYK Test
- RGB Test

INKTEC INK REPORT

It guides you a world of InkTec inks made by high ink formulation technology and thorough test. You will be convinced by this guide book that InkTec inks are right choice for your successful business.
Continuous innovation and cutting edge technology are the key of InkTec Quality

A World-class Leading Company in Inkjet Applications

Creativity
Challenge
Mutual Trust
Right Value