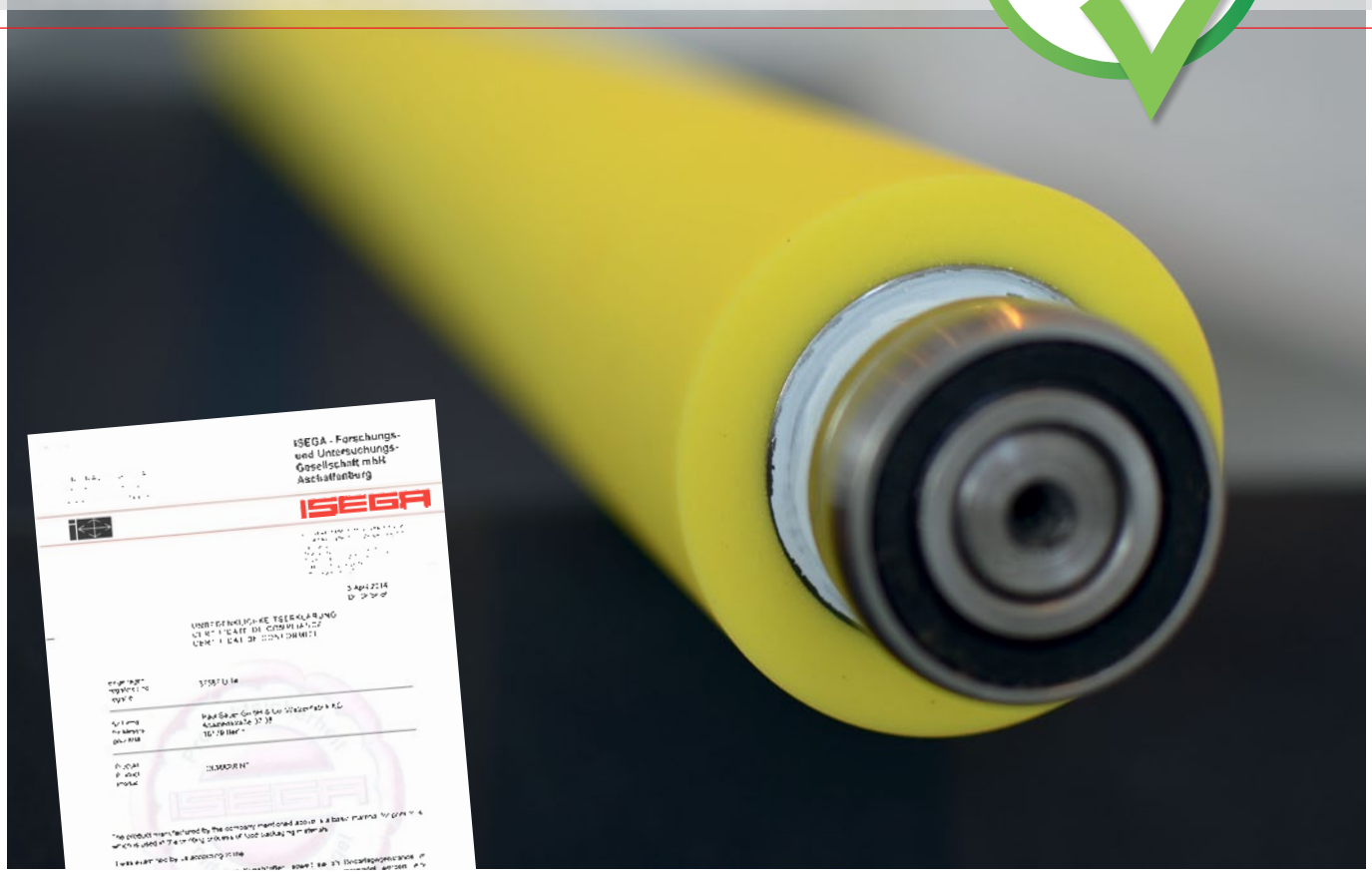
Sauer

GREEN PRINTING

INNOVATIVE ROLLER TECHNOLOGY



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Leading Through Innovation

How to achieve additional benefits from your rollers

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»Obtaining high-quality printed sheets while decreasing process cost at the same time – this is the ultimate benchmark in the printing industry. We take pride in our ink roller system DuraPrint enabling us to have a large share in achieving this benchmark.«

Volker Eggelmann,
Sauer Walzenfabriken GmbH & Co. KG
Management

Especially in the field of sheet-fed printing, the demands on the printing houses have been and are continuously increasing. Digital printing is putting pressure on this segment even more so that smaller editions need to be produced faster at high quality.

At the same time it is of utmost importance to reduce all process cost. Besides, new opportunities are being looked for to reproduce a preferably wide product range.

Thus, many companies in sheet-fed printing are already counting on variability. In many places, machines for mixed printing are common. New technologies such as H-UV, LE-UV, LED-UV etc., which can be also run in mixed printing, have been developing and establishing in the market.

Another challenge for the supplying industry!

Especially concerning the roller covering, we have met this challenge. After an intensive development phase, we have created a revolutionary special elastomer allowing the user to cope successfully with the extreme demands and additionally offering numerous advantages.

The result: quality intensification combining process cost decrease!

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The printing industry – especially sheet-fed printing – is under increasing pressure:

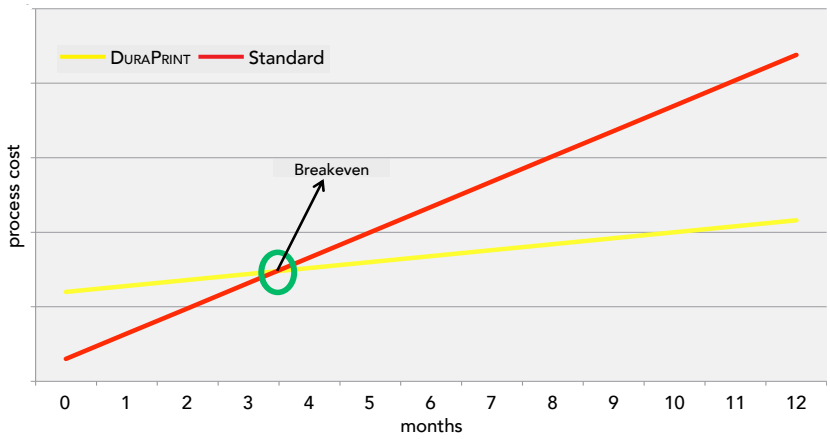
- End customers define short-term delivery dates.
- The customers' expectation to obtain small editions at a low price is increasing because the printed products (quite often promotional products) are to be spread regionally and individualized.
- At the same time the expectation to obtain very high quality is increasing, too.
- As to competition among the printing houses, today, production and labor cost are significantly more relevant than a few years ago

Managers of medium-sized printing houses want and need to meet the end customers' increased demands on the one hand and want and need to optimize the time frame and cost to the absolute limit on the other hand.

Among the numerous possibilities to optimize the process technically, quite often most of them have almost been completely exhausted – whether it is ink measuring and control system, data storage for follow-up jobs or minimizing as much as possible repeat jobs and start-up waste… Meanwhile approximately 75 per cent of all printed products are editions of less than 5000 (with tendency to decrease). Consequences for the printing houses:

- The number of daily job changes is increasing.
- Print units need to be washed several times a day.
- The wash minimizes the rubber rollers' life time significantly.
- The number of make-ready times is increasing …

In printing houses mainly the cleaning process for changing the inks from **dark to light** is a real waste of time. For them the cost for wash is more or less negligible - in fact unproductive time, during which the



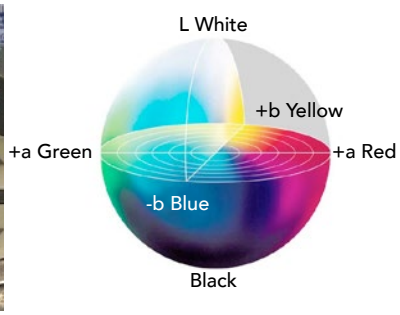
Process cost DuraPrint vs. standard rollers

schematic diagram of the process cost and the averaged payback period

machine is stopped for the washing process, is of more significance. „Sauer Walzenfabriken“ located in Berlin and looking back on more than 100 years of experience in making and distributing graphic rollers made it their business to help optimizing the production process in printing houses. Sauer's research & development department recently placed an ink roller on the market bearing the name „DuraPrint“. Its properties target completely on the printing houses' and eventually on the end customers' needs. Based on an absolutely homogenous elastomer material, the patented DuraPrint roller can be used for UV printing as well as for conventional sheet-fed and continuous printing.

Stable production run properties

The elastomer material and the extremely smooth and homogenous roller surface lead to an extraordinarily brilliant print image. Tests run at one of the well-known machine manufacturer have shown that compared to traditional rubber rollers DuraPrint causes significantly less tone spreading. As mentioned, during the comparative production run DuraPrint and rubber rollers were being used. To achieve a neutral, comparative evaluation the same test pattern was printed with the same inks and the same rubber blankets. In doing so the traditional rubber roller revealed inhomogenous dots with less edge definition.



Washing from dark to light

status quo:
four wash cycles

DuraPrint:
maximum two wash cycles

Applicable tolerances for ink density, tone value and lab according to ISO12647-2

standard	tolerance	cyan	magenta	yellow	black
Handbook of Print Media: Technologies and Production Methoda	deviation	viable by color specimen			
	fluctuation ink density (lay-down)	8%			
ISO 12647-2: 2004 (PSO 2003)	ΔE-deviation	5			
	ΔE-fluctuation	4			5
Tone value	Dot gain range	9%-17%			12%-20%
Tone spread CMY	max. difference	5%			

Tone spread

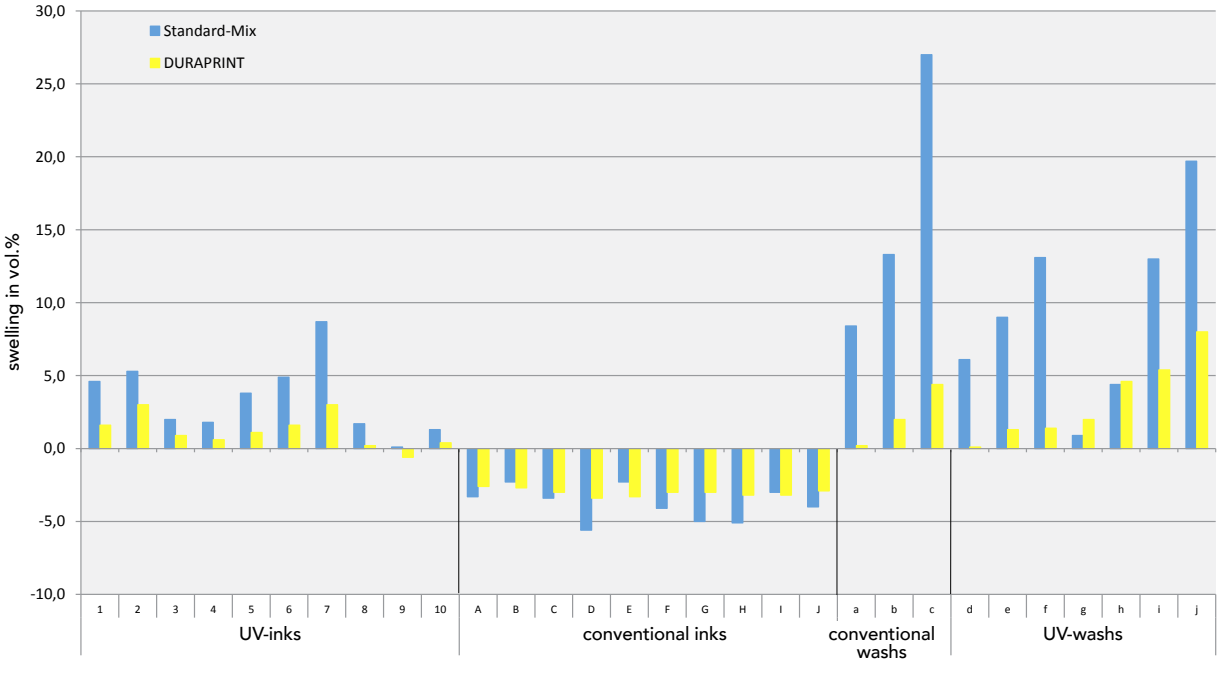
Chromatic color may not vary among each other by more than 5 per cent.

Print result of the DuraPrint roller: **perfect edge definition and homogenous dots**. This effect is being achieved among others by an extraordinarily constant ink transfer of the DuraPrint roller. This very constant ink transfer is mainly responsible for **stable production run properties**.

High dimensional stability

DuraPrint's swelling behavior compared to the one of common rubber rollers does not have any importance during a temporary test procedure but is of even more significance in daily practice. Some printing houses working off their orders in mixed printing do know this phenomenon: When using conventional inks containing resins and oils (e. g. silicone, mineral, coconut, soy, linseed oil) plasticizers are being sucked from the rubber rollers. Thus, rubber rollers shrink. In contrast, other procedures in mixed printing (UV-, LED-UV-, H-UV-process) cause rubber rollers to swell. Rubber rollers are not dimensional stable. Thus, in mixed printing it is extremely difficult to keep the tone values at an optimal constant level with common rubber rollers. Besides, due to poor swelling behavior standard rubber rollers need to be re-adjusted quite often. At this point the DuraPrint roller is fundamentally different compared to the rubber roller. Not only during tests but also during permanent mixed printing in some German and Austrian printing houses the roller turned out to be very dimensional stable.

Comparison swelling standard mix compound and DuraPrint



UV-inks/conventional inks/washs

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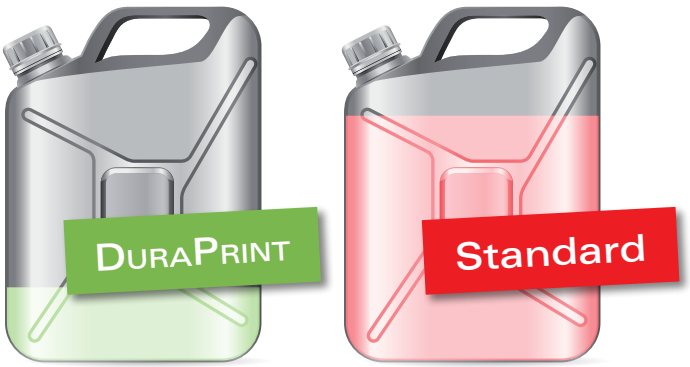
DuraPrint's cconstant daily application in mixed printing confirmed what had been observed in comparing tests: **a brilliant print image revealing less tone spreading**. This dimensional stability results in almost complete elimination of additional roller adjustment work. After more than two years of printing, numerous users attest the roller **„re-adjustment not necessary"**.

Decrease of wash time and wash

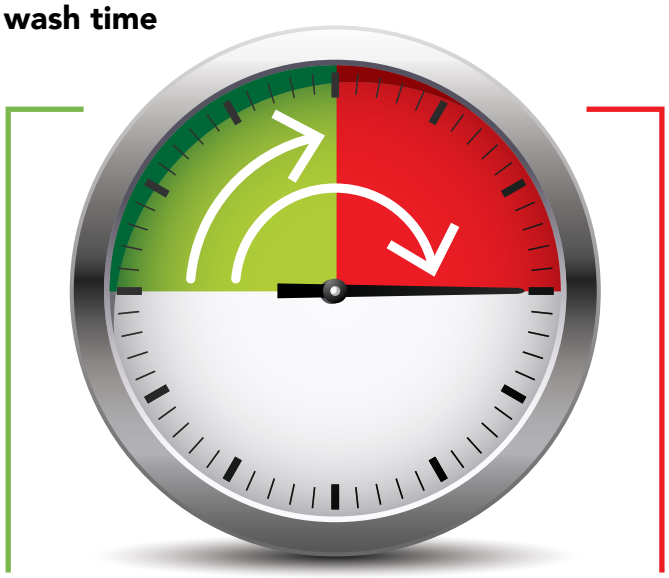
The smooth DuraPrint surface shows another effect which has led in more than three dozen printing houses to a measure-able economical advantage: the number of wash cycles. When changing jobs (mainly from dark to light) common rubber rollers normally need up to four wash cycles. The expenditure of time for this purpose is on average approximately 25 minutes. Even after that time remaining stains still need to be taken into consideration.

wash consumption



According to experience this number of washing cycles is reduced by 50 percent if washing DuraPrint (one to max. two wash cycles).

wash time



DuraPrint Standard

As inks do not have a chance to soak into the homogenous DuraPrint surface, only little wash is needed to obtain a good cleaning result. Here, too, exists experience made in several printing houses: It is said that **up to 80 percent of wash may be saved**. At a price of approximately 1 Euro per liter the savings become economically only marginally noticeable. But for all that: Due to this property in some printing houses DuraPrint attracts attention positively in the ecological evaluation.

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Start-up waste

All DuraPrint users speak of **being fast in the printing process** with this roller. They mean the quick first o.k. proof. The reason for the quickness is based again on the constant ink transfer caused by less deep pores on the DuraPrint rollers. While on common rubber rollers ink soaks into all pores of the roller surface during press proofing and the ink profile of the print job is reproduced on the print sheets delayed, the job profile is being transferred immediately 1:1 when using DuraPrint – the ink does not soak into the roller. **There is hardly any delay.**

This effect also has an impact on the start-up waste. Especially in printing houses, where everyday business is asking for numerous job changes, the start-up waste is a significant cost factor. The DuraPrint roller reduces the waste rate considerably.

Lifetime

What remains is the lifetime question of a DuraPrint roller. Since February 2013, a North German printing house located close to Hannover has been printing on a Heidelberg Speedmaster CD 102/5 + coating unit with DuraPrint rollers. **Production output so far: 120 million printed sheets.** While cleaning the machine with dry ice (Reinigungs- und Pflegeservice Bindemann), co-workers of the Sauer Company recently dismantled the completely intact DuraPrint rollers, unbolted the locking screws and loosened the adjusting screws by exactly two turns. After the cleaning procedure had been finished, the rollers were re-located in position and the adjusting screws were turned back into the original position. And: The adjustment work was done – the rollers are waiting for presumably another million printed sheets.

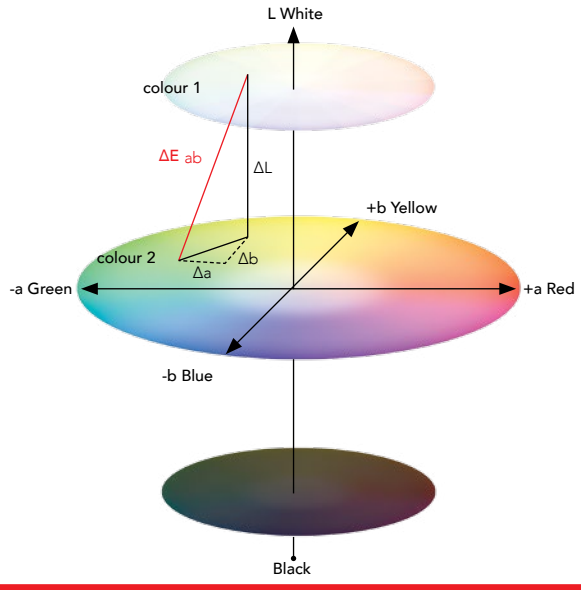
The colour distance ΔE

obtaining ideal values quickly with DuraPrint

ΔE = describes how close two different colors match

The perceivable difference is being rated as follows:

0-1	usually not visible
1-2	very little deviation, only visible by expert eyes
2-3,5	medium deviation, also visible by non-expert eyes
3,5-5	significant deviation
> 6	great deviation



testimonials

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»Once you have worked with DuraPrint, you won't put rubber into your machine again!"«

Stephan Grube, managing director (sales and marketing) of **Sattler Direct Mail GmbH & Co. KG** in Hildesheim (Heidelberg CD 102/5 + coating and Heidelberg SM 102/4)

»... as to print respectively ink stability, these rollers are the best which I have ever installed in a press ...!«

Norman Meyer, pressroom manager of **Ernst Boldt Faltschachtelwerk** in Isernhagen (Heidelberg CX 102/5 + coating)

»Right from the beginning DuraPrint-roller coverings have convinced us. Washing rollers from dark blue to chamois made us apply wash paste and wash it down 4- to 5-times so far. With DuraPrint-rollers you can wash it down one time, apply wash paste and wash down one more time, leaving no residual dirt on the rollers. The press' washing program was modified, too, and we were able to save a significant quantity of wash and water during the first test. At this point the full potential has surely not been realized yet. DuraPrint-coverings also show very quick ink trapping and help reduce paper waste«

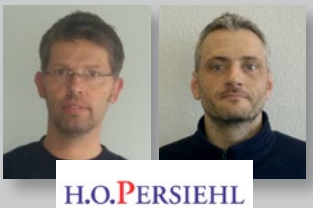
Erwin Berger, pressroom manager of **MM-Neupack** in Reichenau (manroland 900)

»After a 6-months test phase in one print unit, we have equipped ten more 3B- and 6-format print units with DuraPrint. In addition to shorter change-over times during the process of washing especially with special colors, we are also significantly faster and ready for printing than in the past. To me as the pressroom manager it is a priceless advantage that the rollers do not need to be adjusted. Thus the major uncertainty factor in the printing process no longer exists. Once the rollers have been exactly adjusted, they stay that way«

Manuel Lieb, pressroom manager of **Druckerei Höhn GmbH** in Ulm (KBA Rapida 106 + KBA Rapida 142)

»In two of our presses one print unit of each was equipped with DuraPrint-rollers for test purposes. After a short test phase we have modified the washing programs of these units and were able to save time, washing solution and water. Another advantage is in our opinion the ink stability especially when printing with special colors in these print units. These units won't be the only units equipped with DuraPrint.«

Sven Christian, pressroom, **Leopold Verpackungen** in Ludwigsburg (KBA Rapida 142)



»Absolutely dimensional stable, thus no re-adjustment necessary so far!«

Stefan Weise and Timo Kalwinsky, pressroom managers of **HO-Persiehl** in Wanfried (manroland 707+coating)

testimonials

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We have equipped both of our sheetfed presses with DuraPrint, in which we use all kind of special inks as well as oil print coating.

Using DuraPrint we could reduce the water level and achieve a significantly better color density and brilliance in the bright and special inks.

The roller washing was done in less than half the usual time.

Christoph Dürr,
pressroom manager,
Vogel Druck und Medienservice GmbH
in Höchberg
(KBA Rapida 106)

With the purchase of our new manroland 700 printing machine, all 10 printing units were equipped with DuraPrint inking rollers and DuraDamp dampening rollers. As a highly specialized premium packaging printer, we expected, as project partner of Sauer Walzenfabriken, many advantages due to the innovative materials, particularly as we print 100% UV- with 0% IPA. Our expectations regarding colour stability as well as cleaning behavior were completely surpassed. For high-quality printing jobs, we are pleased being the first printing house worldwide with this roller combination, which has improved again our quality and performance!

Hasan Esen,
manager pressroom,
rlc packaging group
in Hanover
(manroland 700)

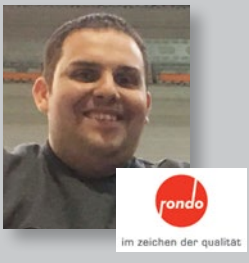
Higher colour stability and a very considerable reduction of the washing time. Owing to the fact, that we use many special inks, the latter is an enormous advantage.

Günter Hering,
manager of quality management,
Otto König GmbH
in Solingen
(manroland 700)

Since the use of DuraPrint we have increased our productivity and quality, shortened the washing intervals and achieved enhanced washing results. The rollers run and run …

Gerd Florian (manager) and Mathias Häde (manager pressroom),
druckpartner – Druck- und Medienhaus GmbH
in Essen (Heidelberg CD 102 + Heidelberg XL 105)

After the roller change to DuraPrint, 26 million sheets have already run through the machine. After 10 million sheets we checked the rollers regarding wear and quality. It was just a dream, they were still like new and without any signs of ware. With the use of DuraPrint rollers we made a big step forward in the matter of quality and speed in offset printing.



Anton Prugger,
pressroom,
Rondo Ganahl AG
in St. Ruprecht
(KBA Rapida 142)

With the purchase of the KBA Rapida 105 we decided immediately for the roller equipment to use the new DuraPrint inking roller compound. Positive information from the market has motivated us to use these new rollers and we are able to confirm customer's opinions. Both, reduced washing time - as well as the very good washing results – while also significantly reduced washing detergent, are unique so far.

Dipl.-Ing. Uwe Engelhardt,
managing director,
Pinnecke & Engelhardt GmbH
in Braunschweig
(KBA Rapida 105)

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Service

Last but not least the Sauer Company considers service as part of the product quality. Thus, upon agreement Sauer offers to install the rollers to the point of regulating the washing program. Consequently it is possible getting the DuraPrint rollers installed by qualified staff while the printing machine is on regular hold. Time is being saved and the machine availability is being increased. Our specialist for DuraPrint – as project manager- advises and supports only our DuraPrint customers and prospective buyers, in order to secure best possible service.

QuickGuide

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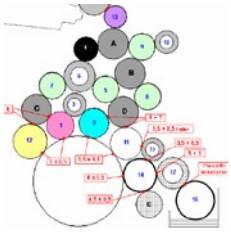
1.Roller adjustment

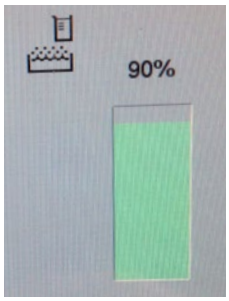
Specification machine manufacturer roller strip:
Example: 5 mm

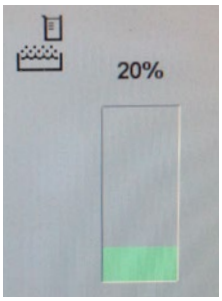


adjustment DURAPRINT:
Example: 4 mm

2.Blade

3.Washing agent





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Conclusion

As to quality intensification and process cost reduction in sheet-fed printing, rollers have been regarded secondary so far.

The rollers used for decades have been rather means to an end. Regardless of the roller manufacturer the rollers' quality was almost comparable.

Bringing DuraPrint rollers onto the market last year, this significance has changed. The minor and supporting character has become a central character. A product offering this many advantages and having an extremely short payback period is not only qualitatively but also economically a piece of luck.

Very large packaging and premium printers are using DuraPrint rollers successfully already.

Significant advantages at a glance:

- extreme fast in printing
- significantly reduced cleaning time
- homogenous, closed and continuous covering
- made for conventional, UV and mixed printing
- easy and quick cleaning calling for significantly reduced wash quantities
- quick washing from "dark" to "bright"
- up to now no restrictions are known regarding washs and inks
- reduced paper waste
- stable production run properties
- improved printing quality
- stable roller marks
- high dimensional stability
- low Δ–E fluctuations
- low tone spreading

INNOVATIVE ROLLER TECHNOLOGY

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