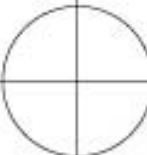


People & Print



DVD & CDs are a feast for the eyes!
Why Offset Printing?



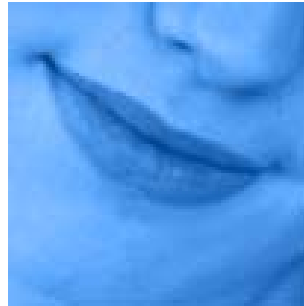
CD & DVD's: Are a feast for the Eyes!



Because of:



Quality



Response



Happiness



New Customers

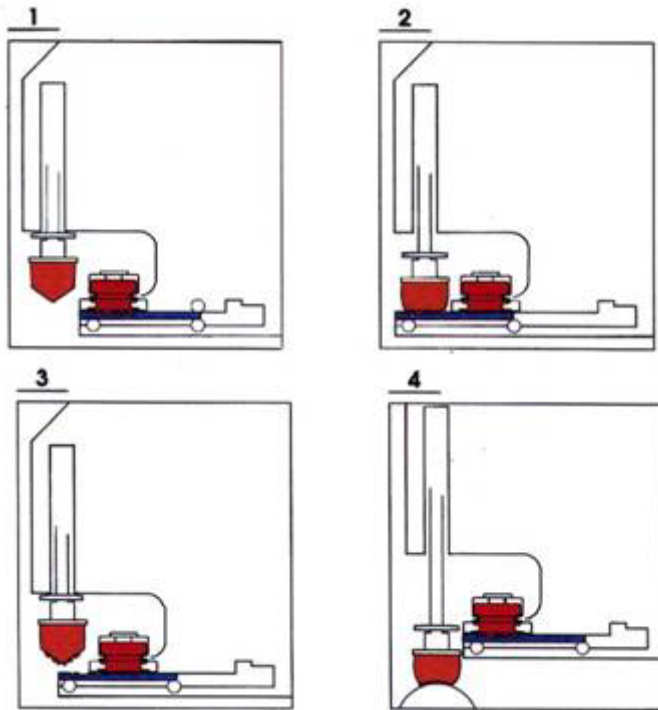


Money



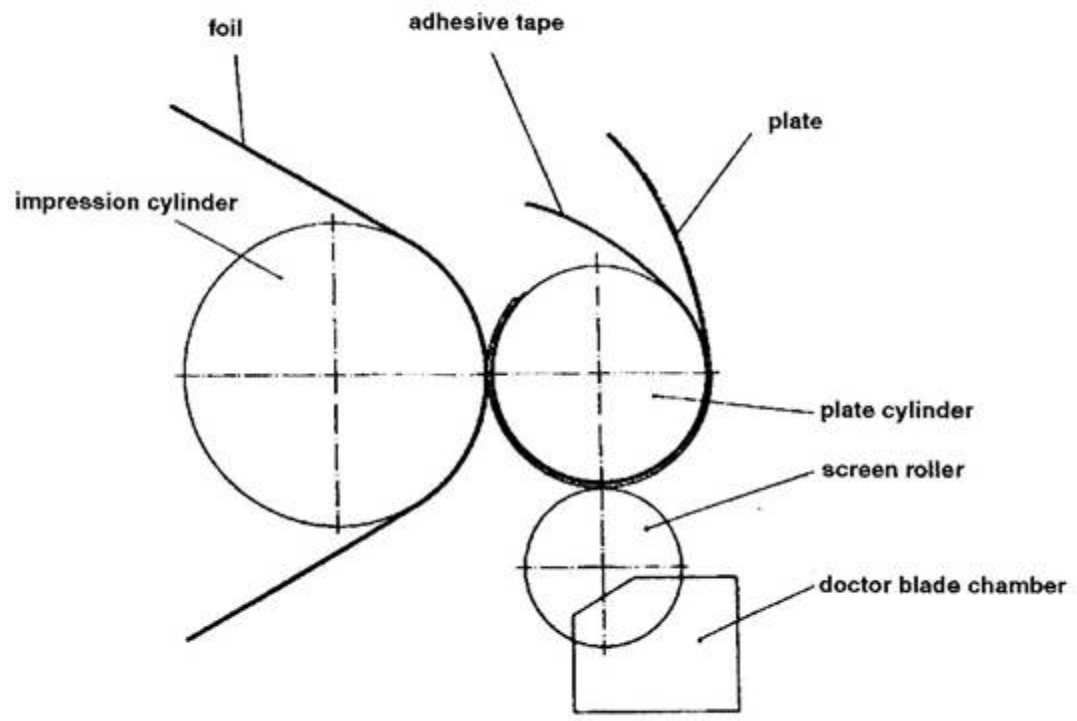
- Pad Printing
- Flexo
- Silk Screen
- Offset
- KBA-Metronic Offset
- Digital

Pad Printing



- Solvent inks
- Intermediate working process
- Expensive print-plates
- Slow process

Flexo Printing

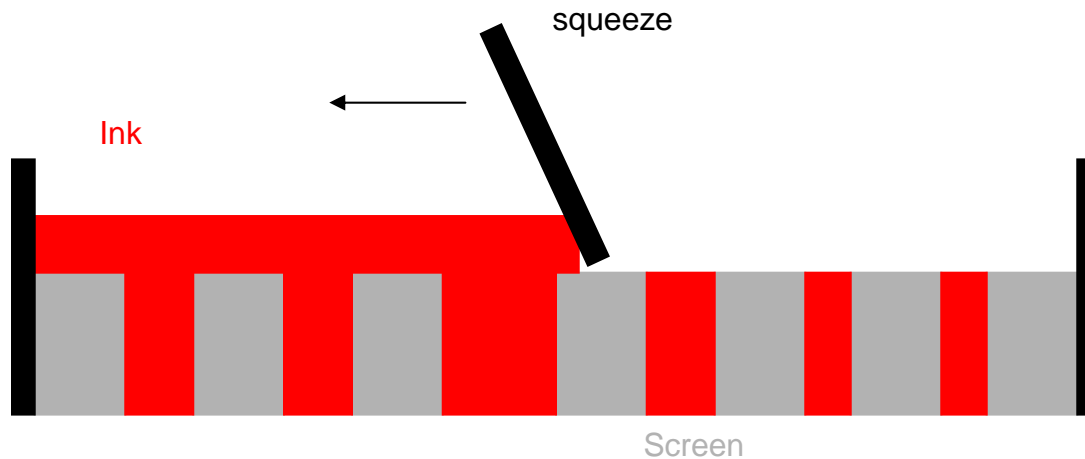


- Rotative process
- UV-curing inks
- Limited quality
- High dot gain

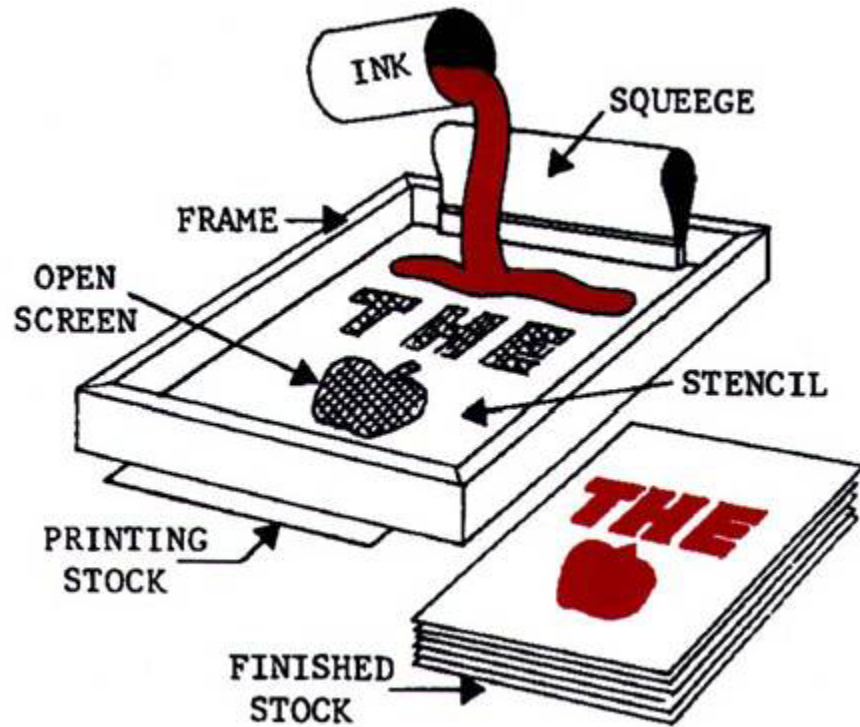
Silk screen



For the longest time, silkscreen printing used to be the dominating technology when it came to optical disc decoration. This has changed dramatically since DVDs are on the move. More and more the complete industry is changing into order and print on demand. The capability to reach a higher quality with offset printing is the reason why offset printing is well established into the traditional silk screen market.



Silk-Screen Printing

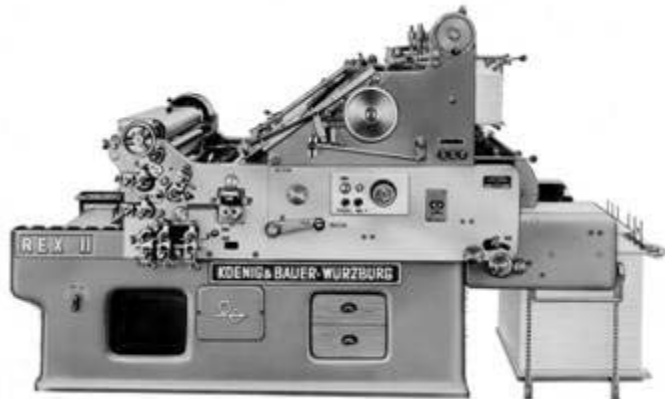


- Ideal for full surface printing
- Bright colors
- High print costs

What is Offset Printing?



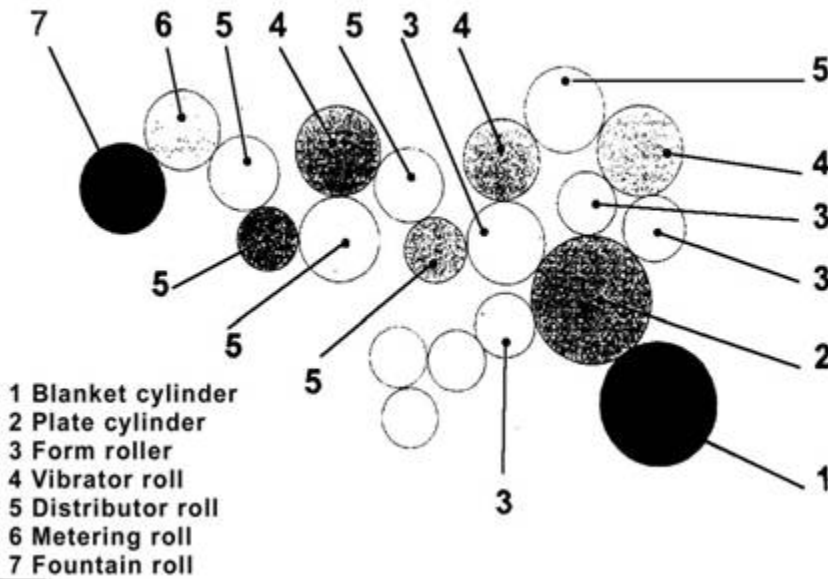
Offset Printing is the most common commercial printing technology in use today. Offset printing applies layers of ink on the page. For each layer, a reverse image of the page is placed on a roller in the printing press. Ink is applied to the non-image areas on the roller, so that as the roller presses against substrate moving through the press, the proper image is left on it.



Offset Printing

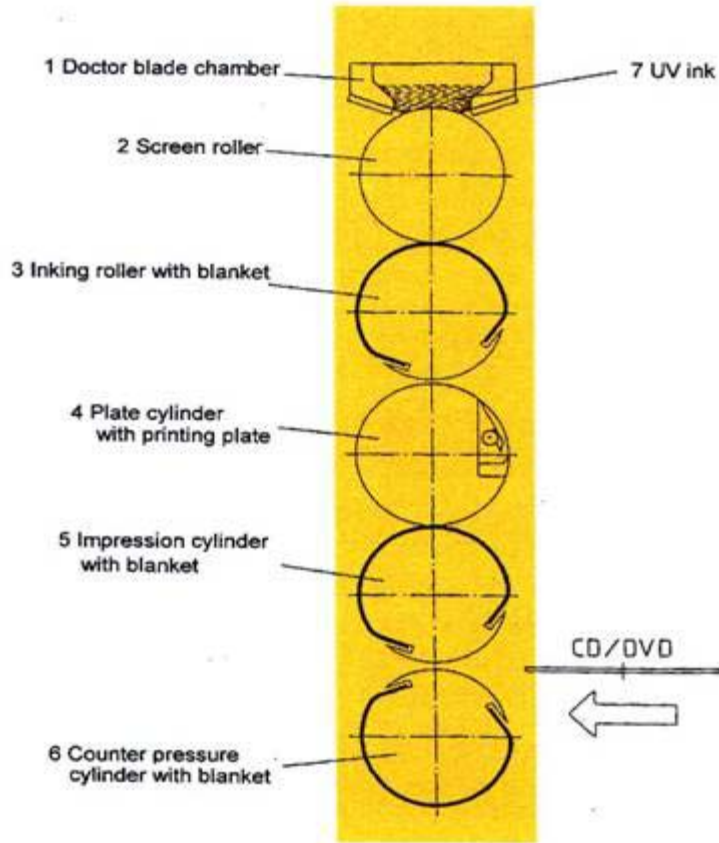


Offset printing unit



- Rotative principle
- Excellent resolution
- Complicated machines
- Skilled operators necessary

KBA-Metronic Offset Printing

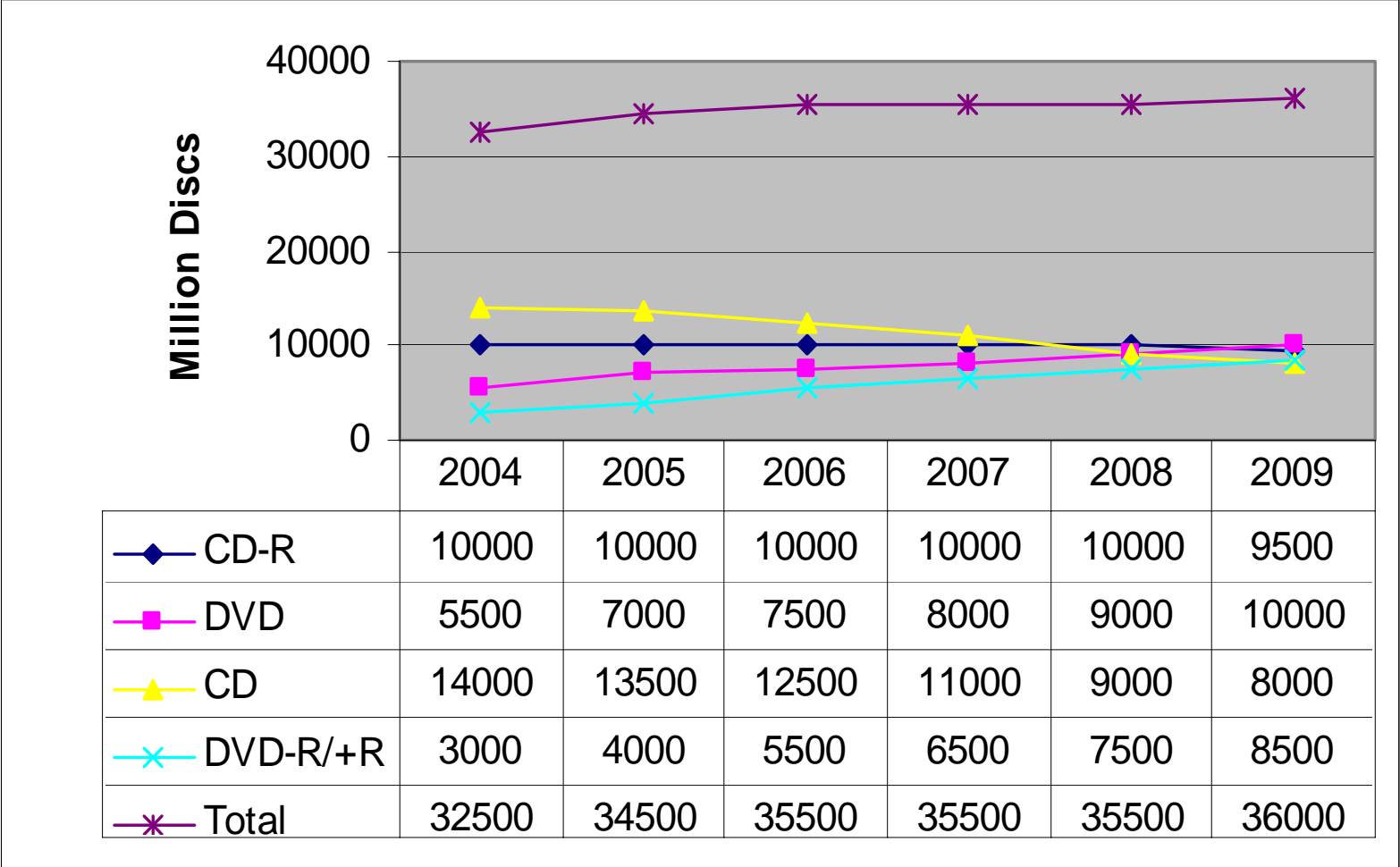


- Simple operation
- Easy reproducibility
- High through-put
- Perfect quality

Forecast Optical Disc Output 2004-09



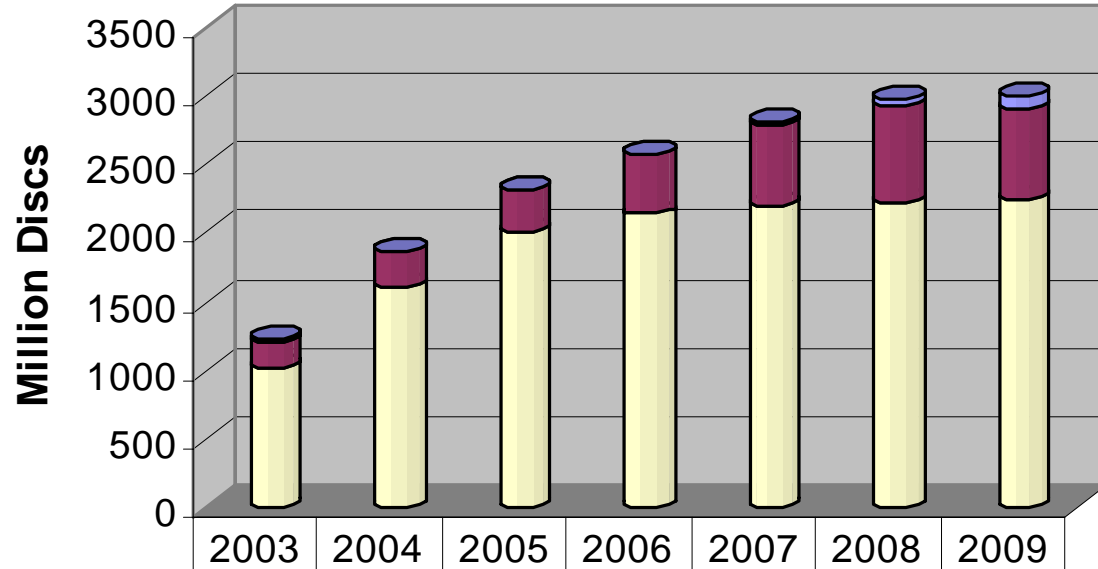
Worldwide



Projected DVD Supply



Europe

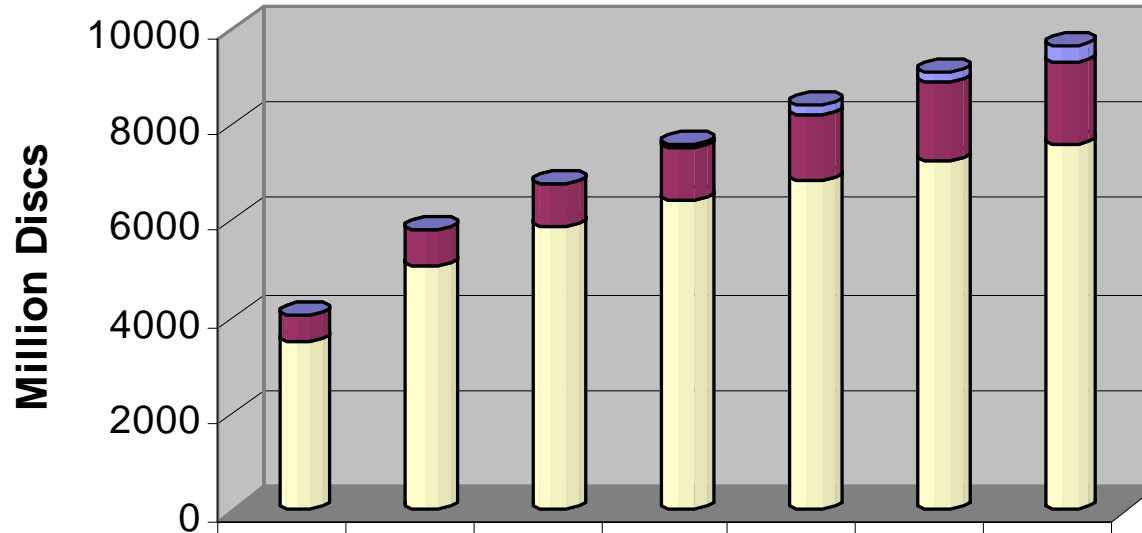


	2003	2004	2005	2006	2007	2008	2009
Audio DVD**	5	5	6	15	37	69	102
DVD-ROM	196	247	306	429	575	691	660
DVD Video	1021	1611	2008	2140	2205	2230	2240

Projected DVD Supply



Worldwide

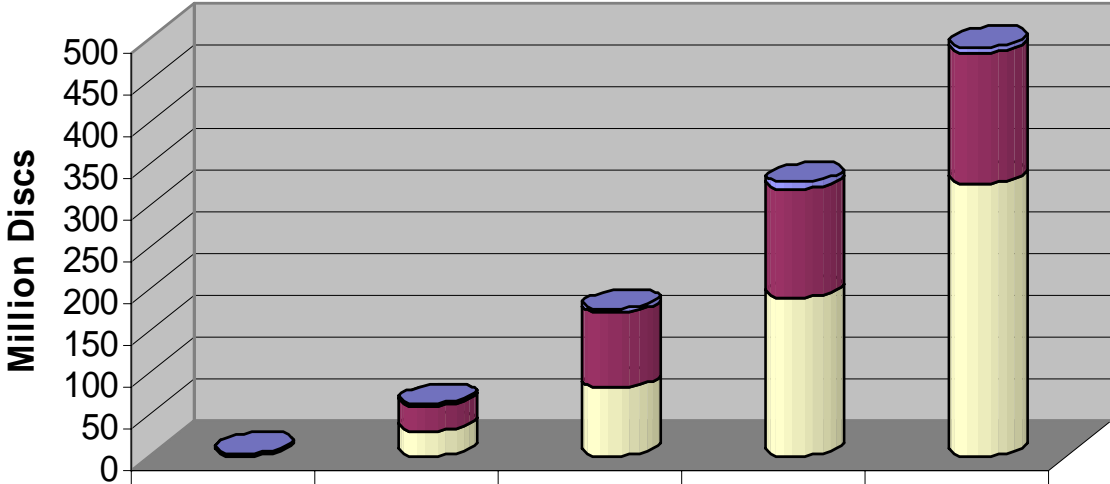


	2003	2004	2005	2006	2007	2008	2009
Audio DVD**	16	23	33	94	170	257	343
DVD-ROM	544	711	840	1070	1358	1599	1651
DVD Video	3490	5091	5898	6423	6864	7260	7615

Projected HD DVD & Blu-ray Production



Europe

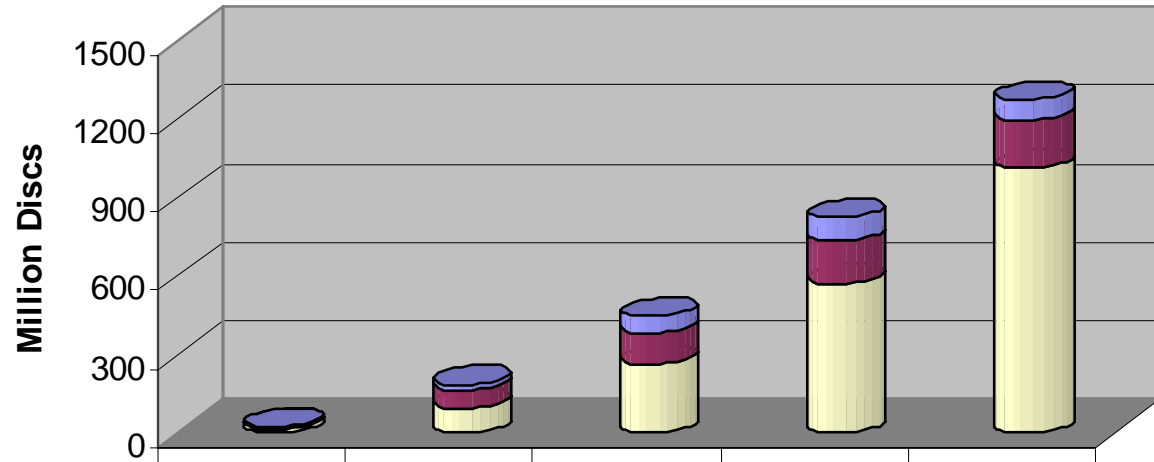


	2006	2007	2008	2009	2010
■ HD DVD Production	1	2	5	9	8
■ Blu-ray based PS3 Production	0	31	89	128	155
■ Blu-ray Video Production	4	30	82	190	326

Projected HD DVD & Blu-ray Production



North America



	2006	2007	2008	2009	2010
■ HD DVD Production	4	24	65	90	78
■ Blu-ray based PS3 Production	3	65	122	164	182
■ Blu-ray Video Production	16	96	260	570	1012



That's why we need Offset-printing



Quality!

- **Needs to be Photorealistic**
- **More Details**
- **More Colors**
- **Easier Operation**
- **Match to Proof**
- **Special requests from your customers**
- **Digital printing is not (yet) accepted**
- **DVD is the driving force for offset demand**





The Optical Disc market is still growing!

- **New formats HD DVD / Blu-Ray**
- **The global forecast shows growth**
- **Reduced delivery time (stock reduction)**
- **Printing on Demand**
- **Tendency to smaller job sizes (1800 pcs. in average)**





Profit

- **Investment in new expensive Silk Screen Printing Presses**
- **Cost of Silk Screen Consumables**
- **Cost of Skilled Operators**
- **Cost of Material Waste**
- **Job Changing & Setup Time**

Offset printing onto Optical Discs



Currently there are two options to be able to offset print onto optical discs. The difference between these two technologies is, that the wet on wet printing only has UV dryers after the printing unit and wet on dry requires a UV dryer after each printing unit. We KBA-Metronic AG offer both wet on wet printing as well as wet on dry printing. There are also two different inking units out on the market. The traditional offset inking unit with approx. 16, 18 or even more rollers and the patented short inking unit from KBA-Metronic AG.



Conventional Inking Unit

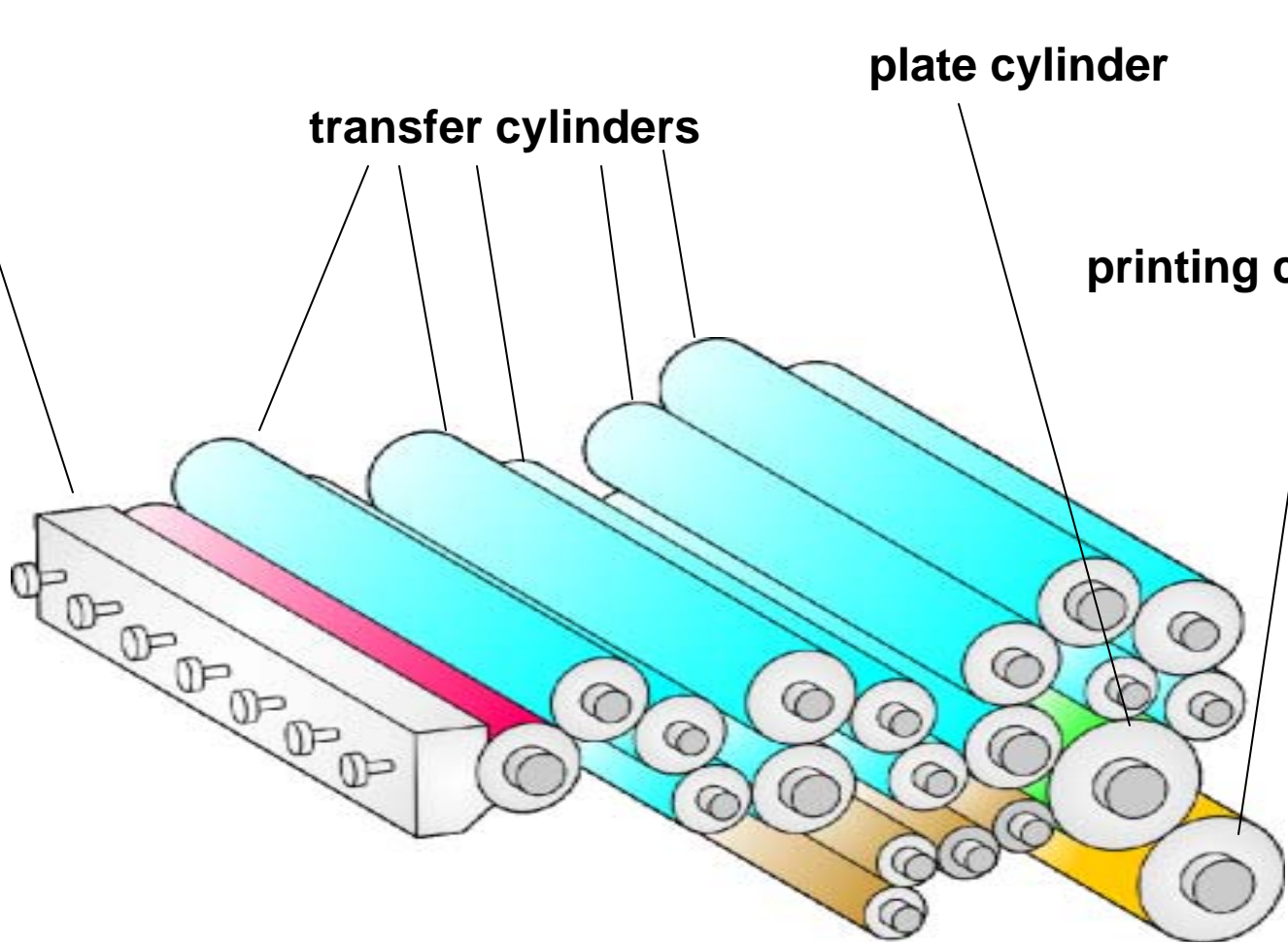


ink chamber & ink zone keys

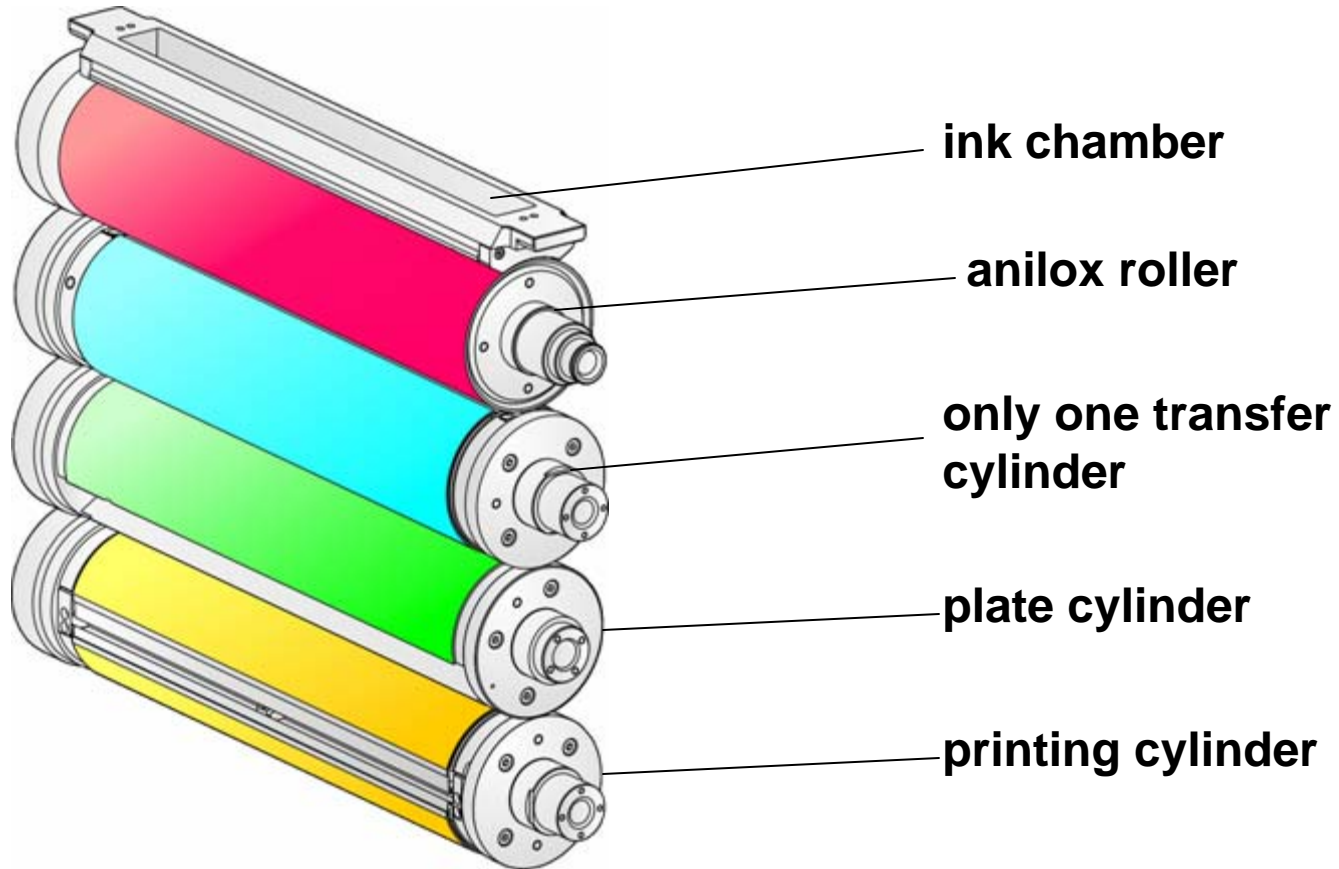
transfer cylinders

plate cylinder

printing cylinder



Ink Unit from KBA-Metronic AG



Offset printing costs for CD & DVD



Assumed printing area:	diameter 120 mm = 11.309 mm²
Print:	1 colour, diameter 120 mm
Inking:	UV-colour
Printing material:	CDs, DVDs etc.
Price per 1 kg ink:	approx. 35,00 USD
Transfer of ink:	ca. 2 g / m²
Typical area coverage:	approx. 20 %
All-over print:	approx. 500 m² / 1 kg
20 % area coverage:	approx. 2.500 m² / 1 kg
Printing costs:	printing area 11.309 mm² = 0,011309 m²
20 % area coverage:	2.500 m² x 0,011309 m² equals 221.063 prints
Price per print:	35,00 USD : 221.063 prints equals USD 0,0001583
Price per 1.000 Prints:	1-Colour 0,15 USD 4-Colour 1,63 USD

Cost Consideration (silk screen – offset)



- **The running costs on offset printing presses are only 25% compared to silk screen printers**
- **Thickness of ink in offset is approx. 1,5 microns, 1 kg of Ink is approx. good for more than 200 000 discs**
- **Waterless printing plates are approx. 3 USD each compared to approx. 10 USD per each silk screen frame**



- **Offset Print quality is much higher**
- **Offset Printing Presses are easier to operate**
- **Offset Printing is less expensive**
- **Offset Printing is faster**
- **Offset Printing is well established**
- **Offset Printing Presses are easier to match with the Proofing device**
- **Digital Printing has not yet the printing quality**



Thank you very much for your attention!

Please feel free to ask any questions!

KBA-Metronic AG Booth # 0603