



Welcome to the



More than just ink ...

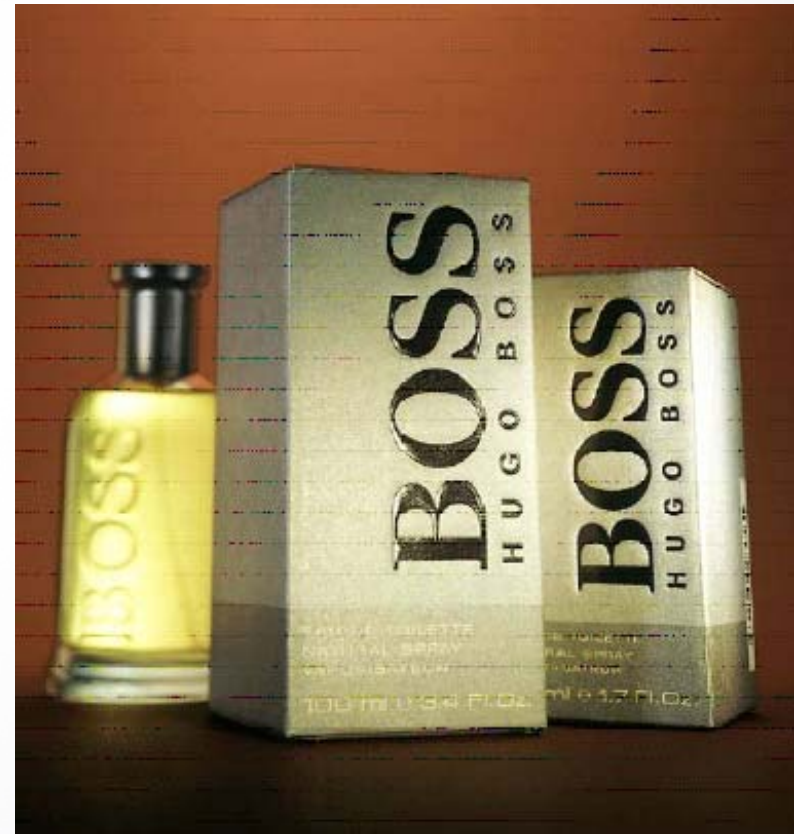


# U.V. Inks & Varnishes for Packaging Printing

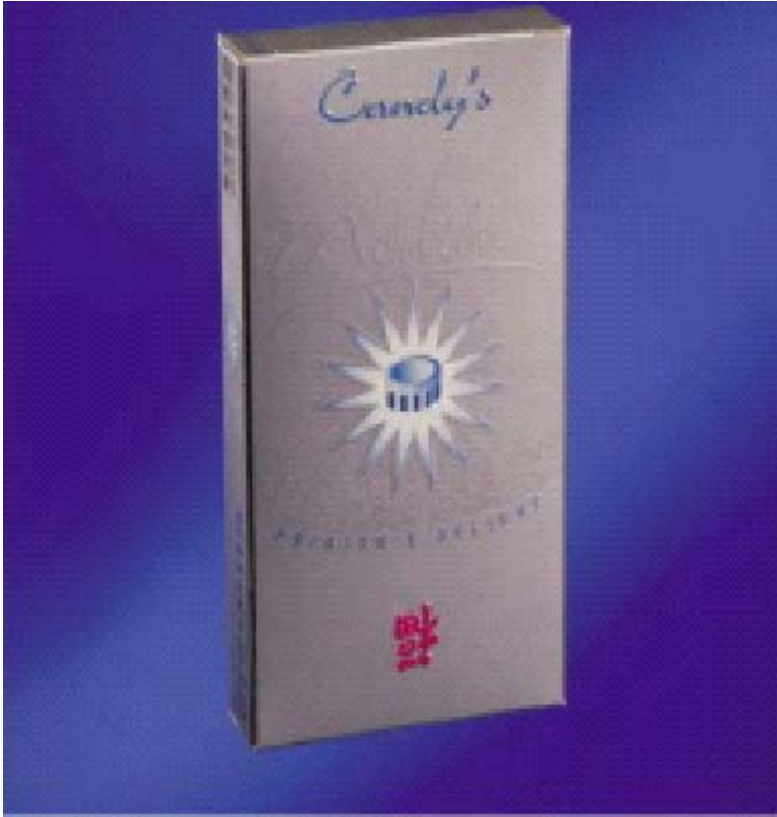
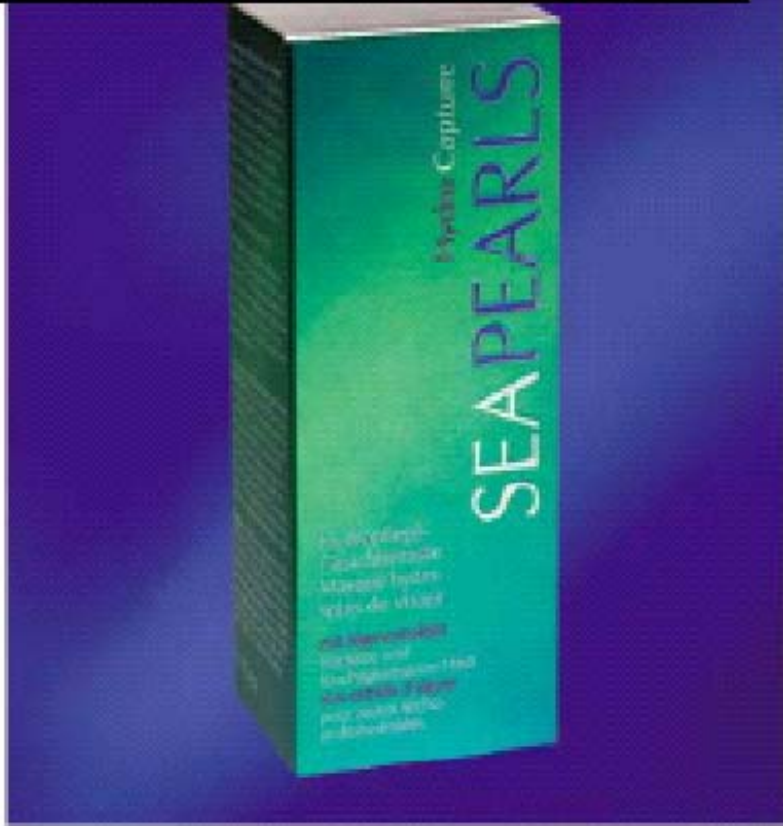
**PackAge 2007 - New Delhi**

**22<sup>nd</sup> August 2007**











# PRINTING OPTIONS

## OFFSET

Folding cartons (Tooth paste, cosmetics, liquor)

Tins & Cans (Cold beverage, milk powders, pesticides, lubrication oils)

## GRAVURE & FLEXO

Flexible packaging (pouches, wrappers, labels)

## ROTARY LETTER PRESS

Multiplayer tubes, labels (tooth paste, shaving creams)

## SCREEN

Plastic moulded containers (Coconut oil, lubricating oils, greases, cosmetics, medicine tablets & tonics)

# CONVENTIONAL INKS AND COATINGS – LIMITATIONS

## OFFSET

Printing On Impervious Substrates, Longer Waiting For Post Printing, Roughness In Print Due To Spray Powder, Gloss & Hardness Of Coatings

## GRAVURE FLEXO

Environmental Pollution

## SCREEN

Slower Drying, Stacking Of Printed Bottles, Not Suitable On Automatic High Speed Machines

# U.V.INKS & COATINGS - ADVANTAGES

## OFFSET

Instant drying on impervious substrates, faster post printing, smoother finish, coatings with high gloss & hardness

## GRAVURE & FLEXO

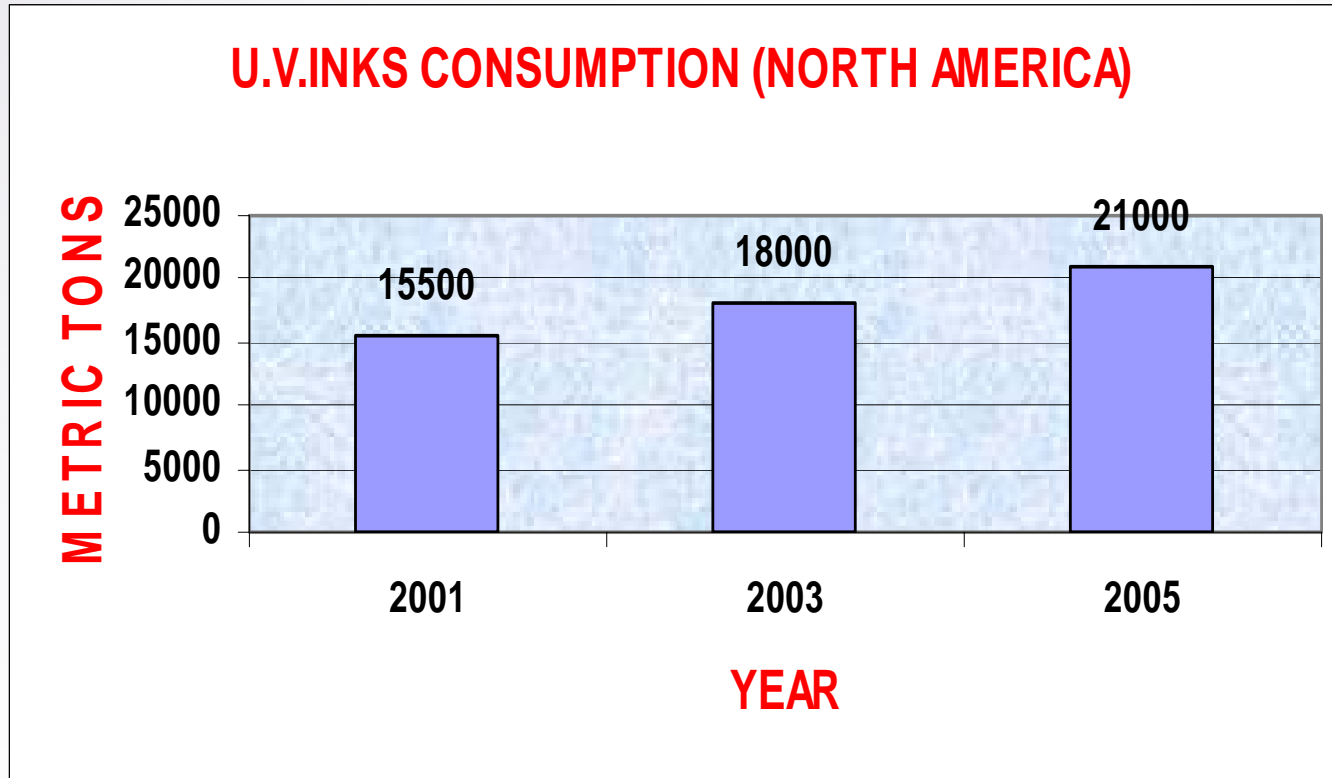
Solvent less, environment friendly, higher depth at lower ink thickness

## SCREEN

No stacking hence hygienic, higher ink depth at lower ink thickness

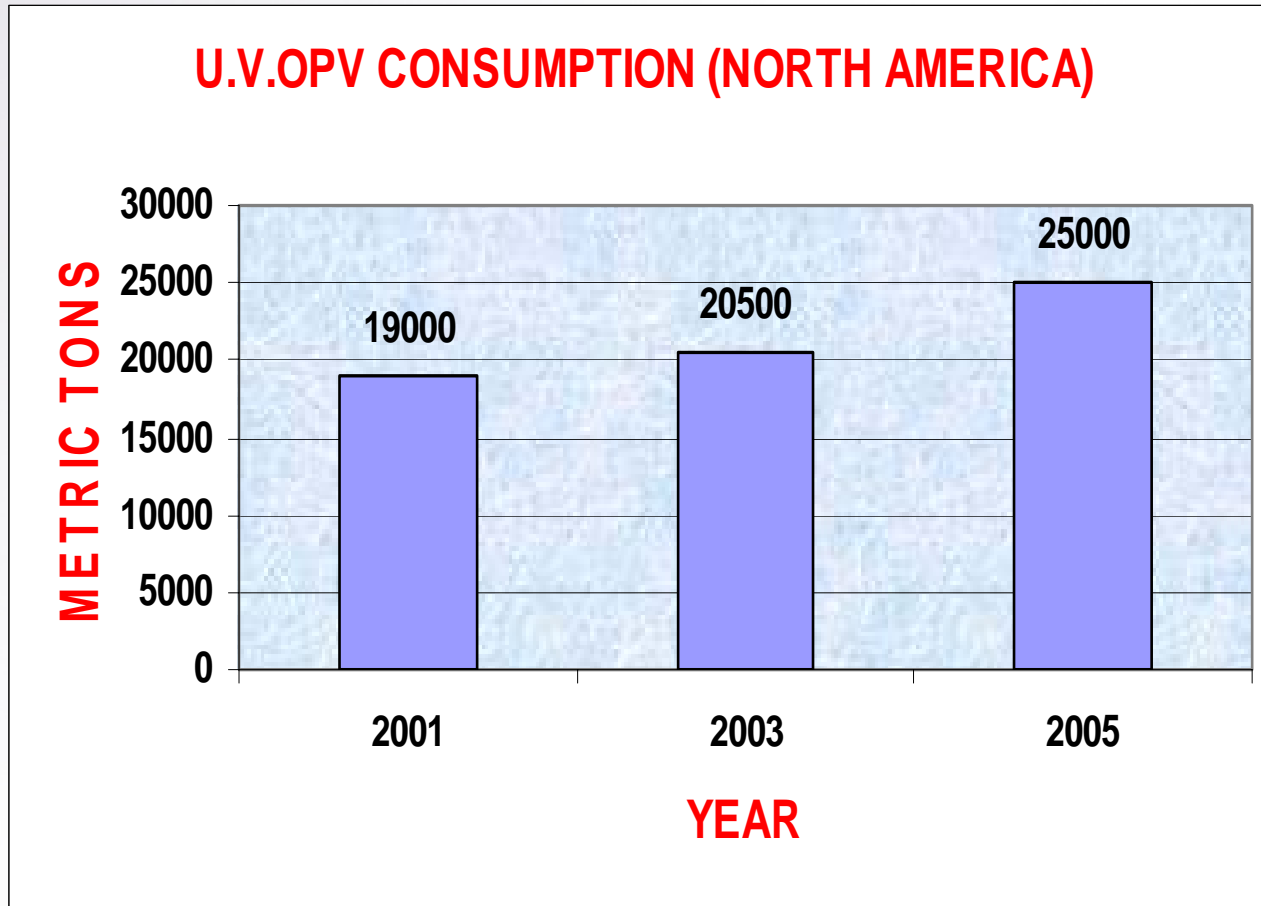


# U.V.GROWTH – PRINTING INKS





# U.V.GROWTH – COATINGS





# APPLICATION TREND

<b>U.V. INKS &amp; COATINGS</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
<b>OFF LINE COATING</b>	<b>37 %</b>	<b>35 %</b>	<b>31 %</b>	<b>29 %</b>
<b>IN LINE COATING</b>	<b>17 %</b>	<b>20 %</b>	<b>22 %</b>	<b>23 %</b>
<b>OFFSET</b>	<b>19 %</b>	<b>20 %</b>	<b>22 %</b>	<b>24 %</b>
<b>GR.FLEXO</b>	<b>4 %</b>	<b>4 %</b>	<b>5 %</b>	<b>5 %</b>
<b>SCREEN</b>	<b>14 %</b>	<b>14 %</b>	<b>14 %</b>	<b>14 %</b>
<b>ROTARY L/P</b>	<b>9 %</b>	<b>7 %</b>	<b>6 %</b>	<b>5 %</b>

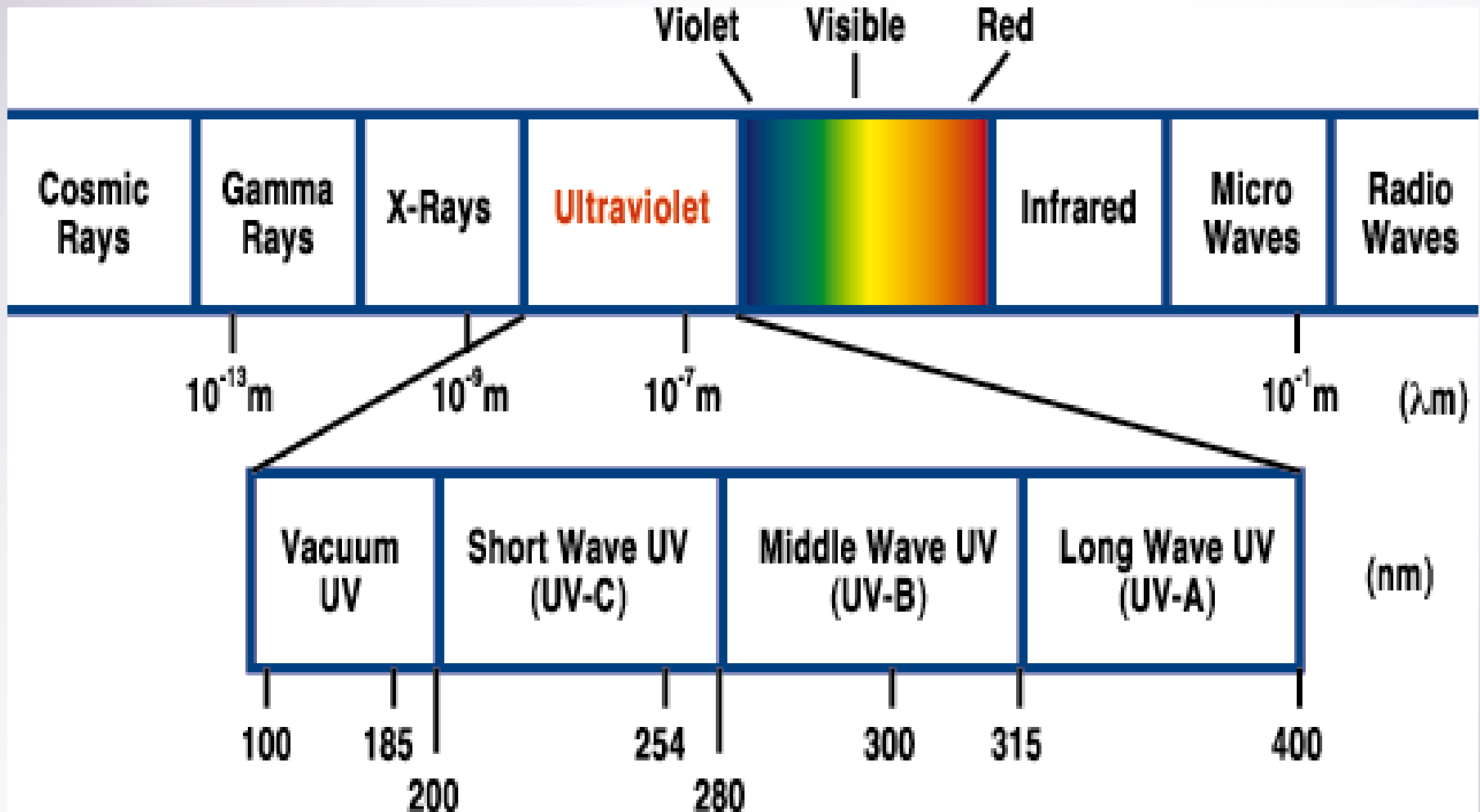
# SUN



**THE NATURAL SOURCE OF ENERGY**

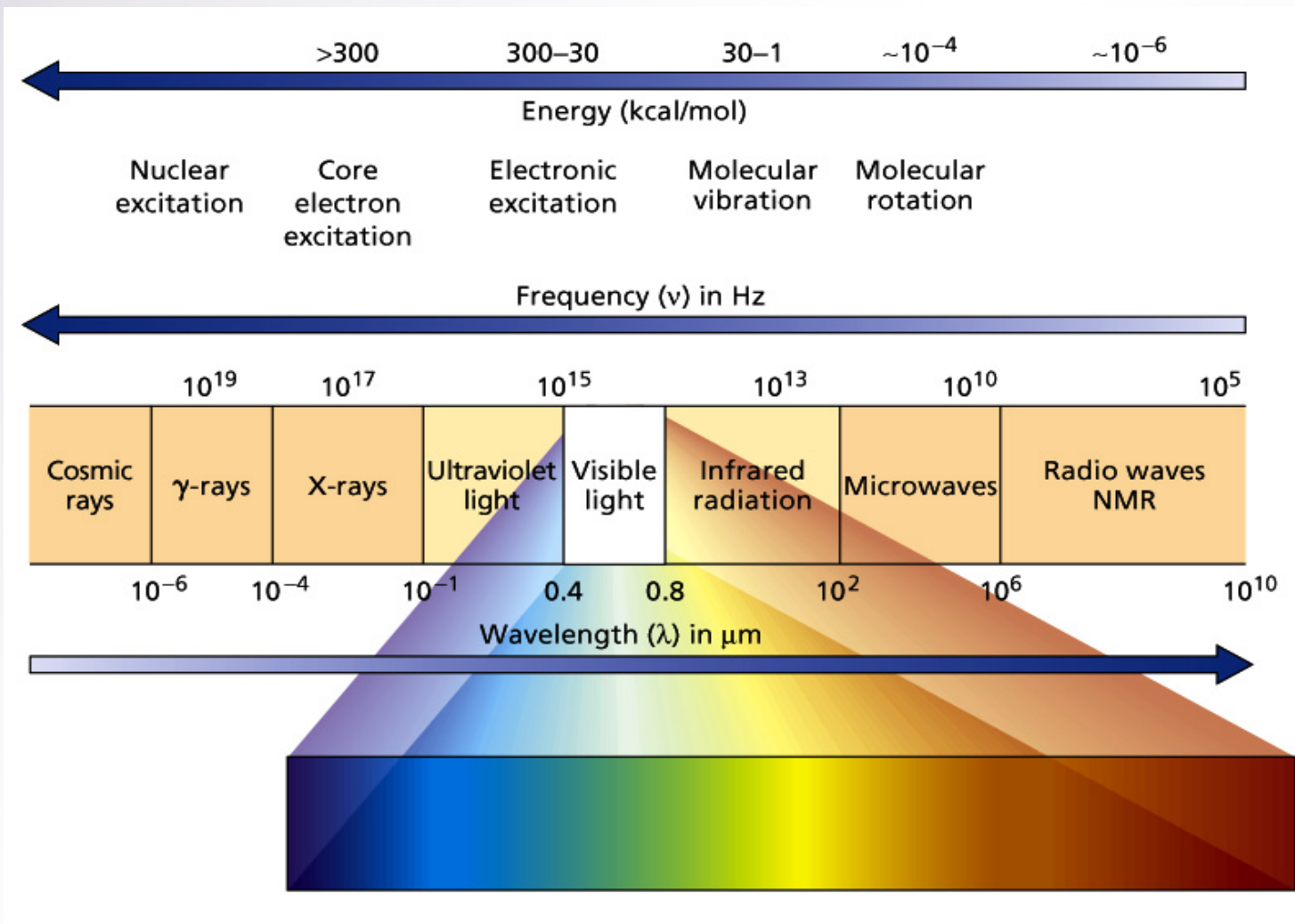


# U.V. RADIATION





# WAVELENGTH AND ENERGY



# CONVENTIONAL V/S U.V. OFFSET INKS TECHNOLOGY

## CONVENTIONAL

PIGMENTS

VARNISH

OILS / SOLVENTS

DRIER

ADDITIVES

## UV SYSTEM

PIGMENTS

OLIGOMERS

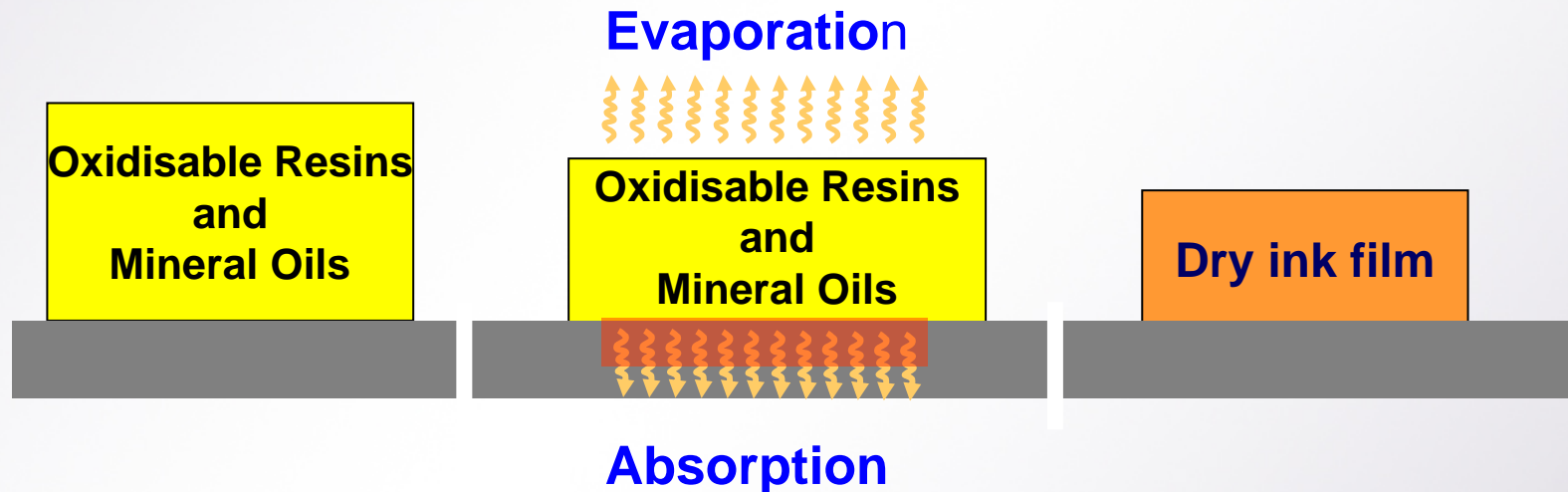
MONOMERS

PHOTO INITIATORS

ADDITIVES

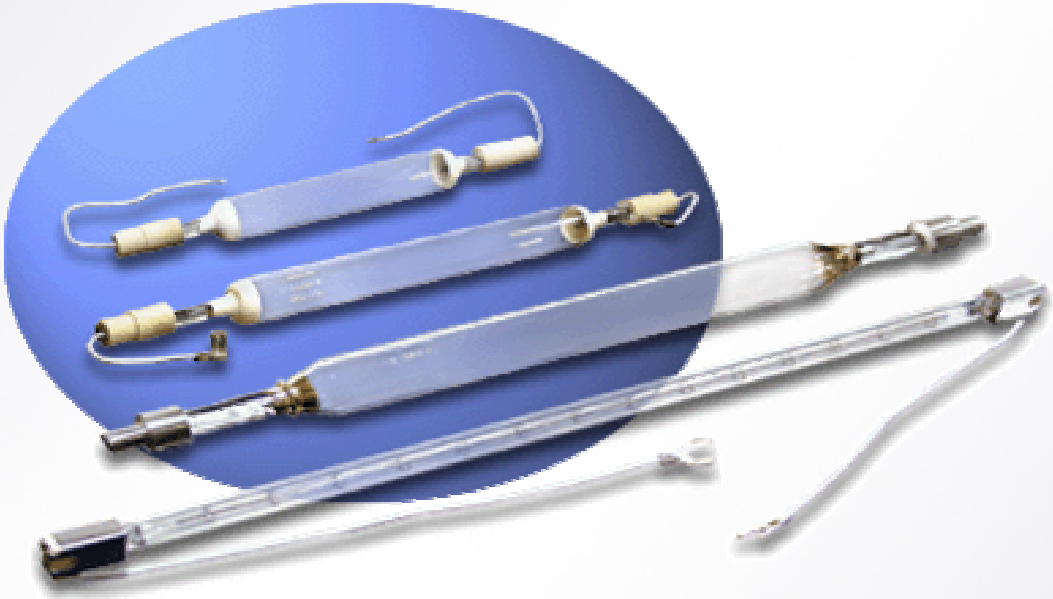
# DRYING MECHANISM

## Conventional or Solvent-based drying

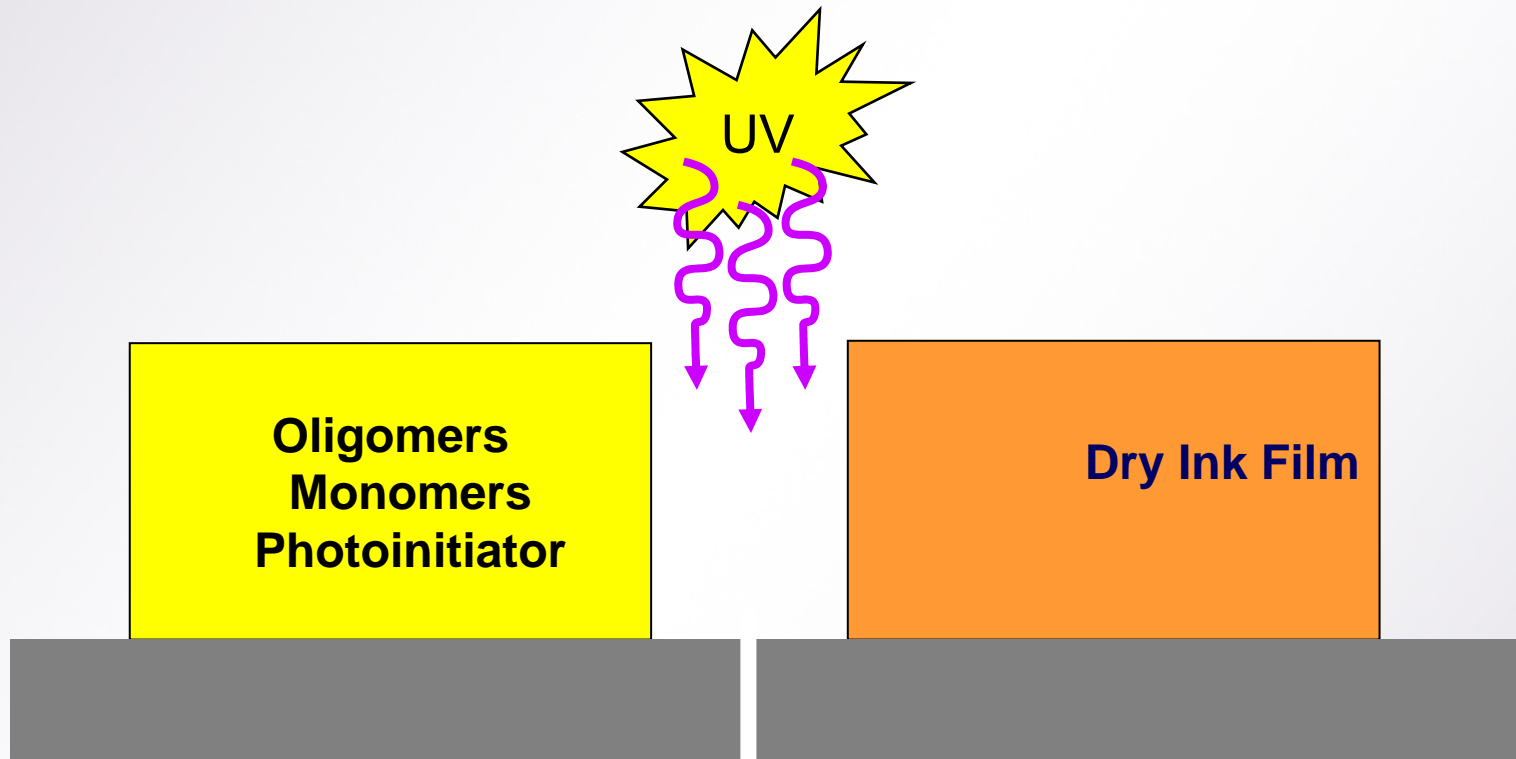




# U.V.LAMPS

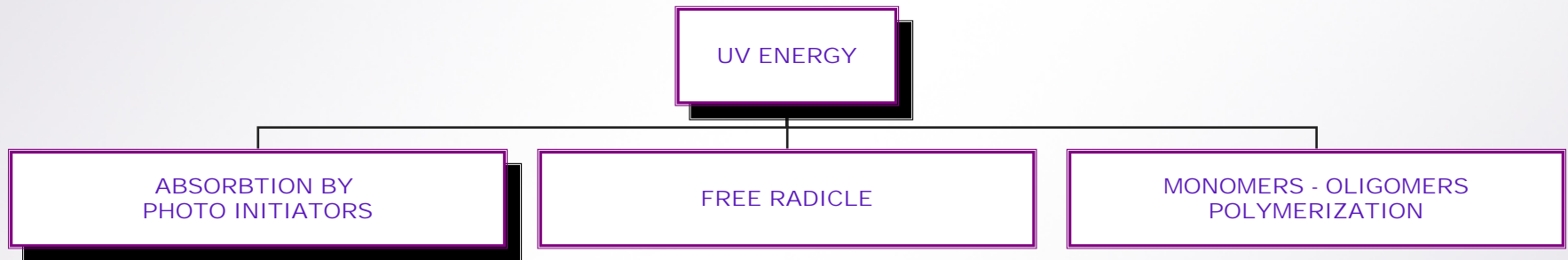


# CURING MECHANISM

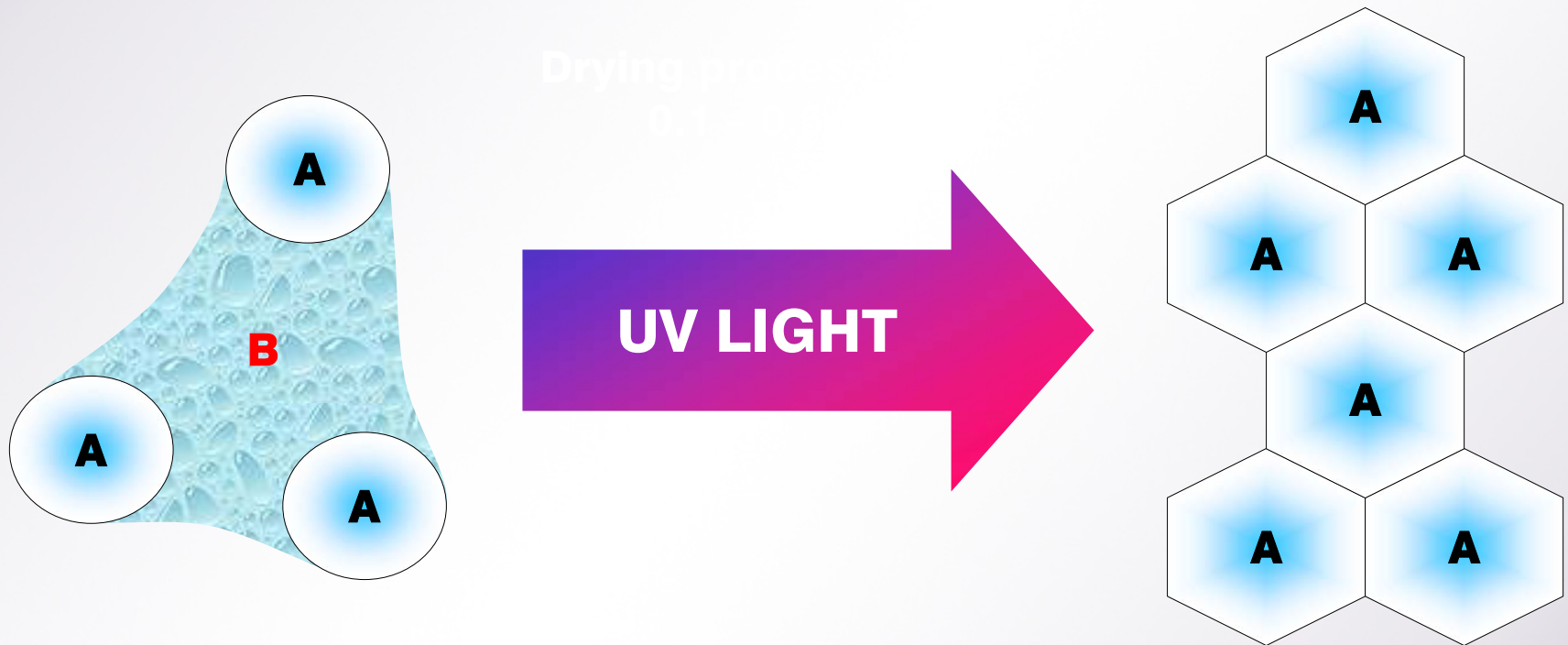


# UV TECHNOLOGY - POLYMERIZATION MECHANISM

UV LAMP

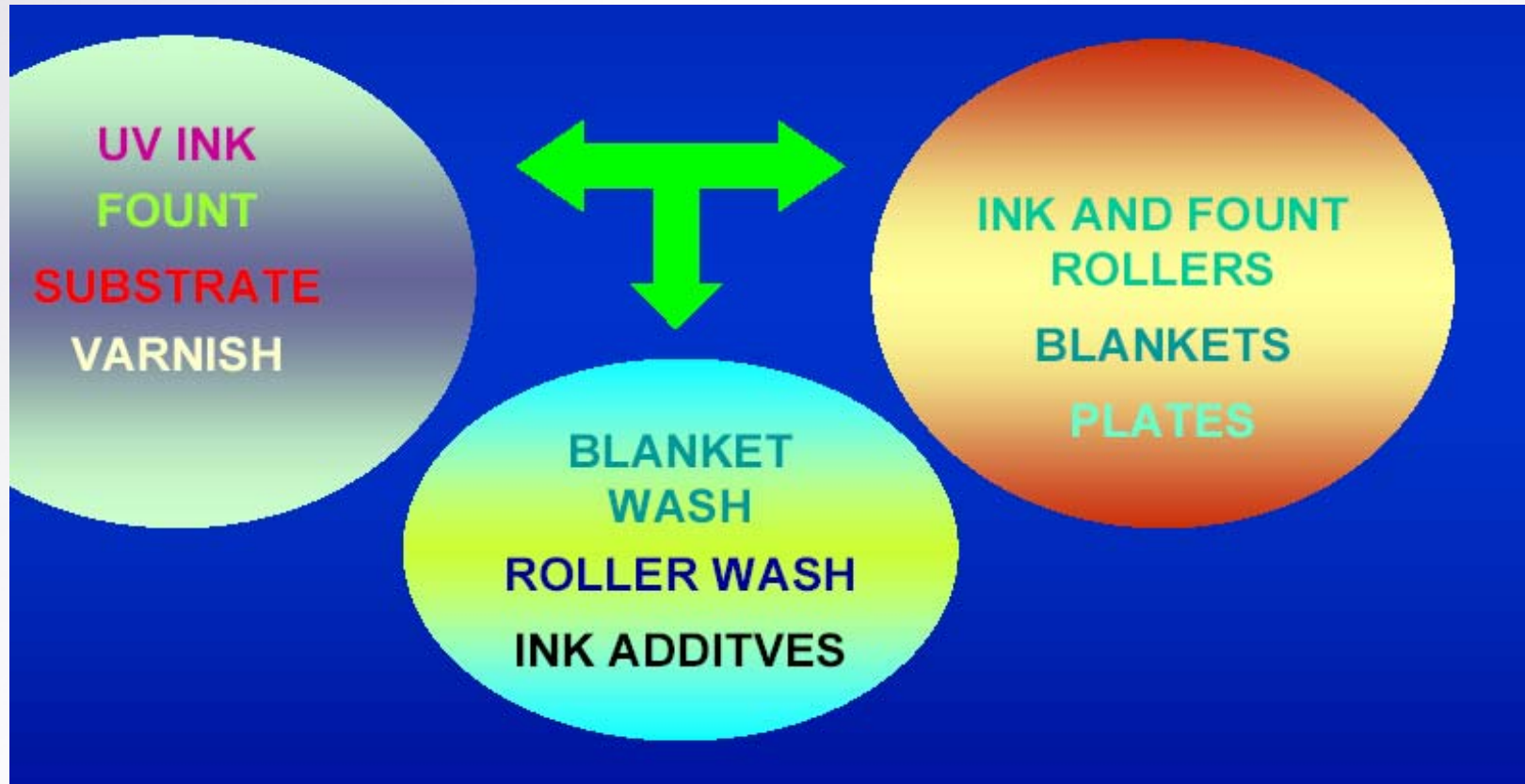


# UV TECHNOLOGY - POLYMERIZATION MECHANISM



**A = Oligomer molecule in ideal spherical shape**  
**B = Liquid binder with photo initiators**

# U.V.OFFSET PRINTING



# U.V.OFFSET PRINTING - Considerations

**Special roller coverings (nitrile rubber, EPDM)**

**Baked negative/positive plates, CTP**

**Special fount solution (UV/non absorbent substrates)**

**Ink agitator into the ink duct**

**Ink cooling unit device (stabilization ink/fount balance)**

**Accurate adjustment of ink and fount rollers**

**Ink roller compound with hardness of at least 40° Shore**

**Use of proper washing agents (alcohols)**

# **SUBSTRATES - Considerations**

**Papers / boards**

**Complex composite materials**

**Plastics**

# SUBSTRATES - CONSIDERATIONS

**Papers / Boards**

**Matt and Glossy**

**Cast - Coated Papers / Boards**

**Recycled Papers**

**Uncoated Papers**

**Thermal Papers**

# SUBSTRATES - CONSIDERATIONS

## Paper / Board – Characteristics

**Surface Absorbancy:**

**Gloss**

**Curing**

**Odour (Penetration of Monomers)**

**Surface Smoothness:**

**Rub Resistance**

**Gloss**

# COMPOSITE MATERIALS

**Complex = Composite Made up of Different Materials**

**Plastic composite materials:**

Board / Polyethylene

**Metallised composite materials:**

Board / Aluminium Foil

Board / Vapour-Deposited Aluminium (Metallization))

Board / Metallized Polyester



# PLASTICS



<b>PVC</b>	<b>Poly Vinyl Chloride</b>
<b>OPP</b>	<b>Oriented Poly Propylene</b>
<b>PET</b>	<b>Polyester (Poly Ethylene Terephthalate)</b>
<b>PE</b>	<b>Poly Ethylene</b>
<b>PC</b>	<b>Poly Carbonate</b>
<b>ABS</b>	<b>Acrylonitrile – Butadiene - Styrene</b>

# **SUBSTRATE - SURFACE FREE ENERGY**

## **Before treatment in dyne/cm:**

**Poly Propylene PP – 30**

**Poy Ethylene PE – 31**

**Poly Styrene PS – 34**

**ABS copolymer – 36**

**PVC Polymer – 40**

**PETP Polymer – 43**

**Poly Carbonate - 45**

# PLASTICS

**Surface Tension Must Be At Least**

**38-40 dyne/cm**

# U.V.OFFSET PRINTING

**U.V. inks absorb less fountain solution than conventional inks**

**Special fount solution necessary**

**Fount temperature controlled between 8 to 12 °**

**Use of proper washing chemicals**

# U.V.OFFSET PRINTING

## WORKFLOW

### Before printing

Benchmark test for consumables/commodities  
Regular batch check of pretreated substrates  
Regular press adjustments check (rollers)

### During printing

Check and maintenance of U.V. dryer

### After printing

Finishing and storage (air conditioning)  
Humidity will penetrate UV ink and varnish film  
Tape resistance will be reduced when delivered

# INSTRUCTIONS FOR USAGE

**Never mix UV inks with conventional inks**

**Ink film thickness must be carefully controlled**

# HINDRANCE OF REACTION

**Short-wave U.V radiation energy is absorbed by pigments is high, U.V rays penetration is less to the lower layer of ink film. Hence dark colour like Black is printed first.**

# U.V. COATINGS

## UV Coating ingredients

Oligomers

Monomers

Photoinitiators

Additives



# COATING OPTIONS

## INLINE COATING

SHOULD BE USED ON U.V./HYBRID INKS

## OFFLINE COATING

CAN BE USED ON CONVENTIONAL INKS



# INLINE COATING

ROLLER COATING

THROUGH INK DUCT

# OFFLINE COATING

**ROLLER COATING**

**OFFSET - THRU INK DUCT**

**- THRU DAMPENING**

**SCREEN PRINTING**

**CONSIDERING THE ROUGHNESS & ABSORPTION OF SUBSTRATES,**

**IT IS ADVISABLE TO USE WATER BASED PRIMER COATING TO**

**AVOID DIFFERENTIAL GLOSS BETWEEN PRINT & NON PRINT AREA.**

# CLEANING THE PRESS

## **Inking Unit**

Use U.V wash solution HUV-0005

Make sure it dry thoroughly before inking

## **Plate & Blanket**

Use HUV-0005

## **Dampening Rollers**

Use HUV-0005

Avoid U.V. wash contaminant to dampening unit

# HANDLING OF U.V INKS, VARNISHES & WASHES

**U.V inks & varnishes irritate and washes degrease the skin. Special handling and safety instructions to be observed:**

**Avoid skin contact**

**In case of skin contact,  
wash immediately with soap & water**

# STORAGE OF U.V INKS & VARNISHES

**Store it in closed container in cool, dry place preferably at 20°C**



**THANKS FOR LISTENING...**