



Pollution prevention  
at source in the

**Printing sector**  
and allied industries

**CD**

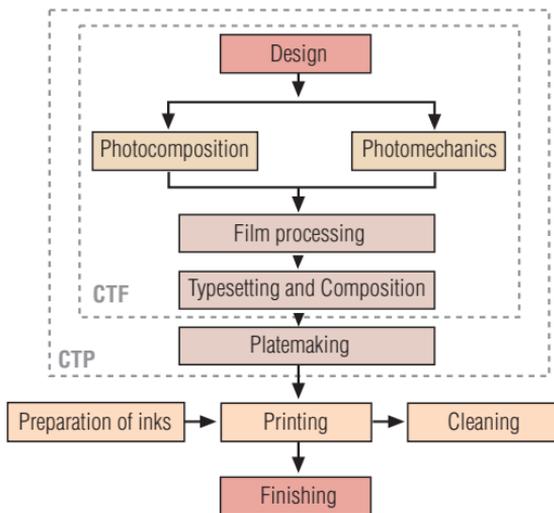
Castellano

English

Français

*The Regional Activity Centre for Cleaner Production (RAC/CP) of the Mediterranean Action Plan has prepared this brochure on pollution prevention within the printing sector and allied industries aiming to present some of the alternatives for reduction and recycling at the source, as well as optimization of the production processes.*

## *General process of the printing sector and allied industries*

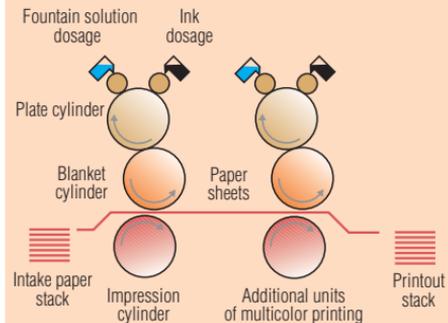


<i>Minimisation alternatives</i>		Reduction in water consumption	Reduction in energy consumption	Reduction in raw materials consumption	Reduction in air emissions	Waste reduction	Increase in productivity	Quality improvement
PRE-PRESS	Computer-to-Film (CTF)	■	■	Film / Developer / Fixer		Spent film baths	■	■
	Computer-to-Plate (CTP)	■	■	Film / Developer Fixer / Plates / Developer		Spent film and plate baths	■	■
	Recovery and recycling equipment for film developers and fixers	■		Film Developer / Fixer		Spent film baths		
	Plate developer filtering	■		Plates / Developer		Spent plate baths		
	Support conditioning before printing			Printing support		Printed product	■	■
PRINTING	Use of environment-friendly inks				■	Hazardous waste		
	Waterless (only offset)	■		Fountain solution	■	Spent solution		■
	Use of alternative fountain solution (only offset)	■			■	Hazardous waste		■
	Extend the life-time of fountain solution	■		Fountain solution		Spent solutions		■
	Measure of the conductivity of fountain solution	■		Fountain solution		Spent solutions		■
	New generation fountain solution system	■		Ink / IPA*	■	Spent fountain solution		■
	Water oxygenation	■		Ink / IPA*	■	Spent fountain solution		■
	Use of color measurement equipment			Inks / Support		Printed product / Spent ink	■	■
	Automatic addition of solvents (only rotogravure and flexography)			Solvents	■	Hazardous waste	■	■
	Closed chamber inkpot				■	Hazardous waste	■	■
	Manufacture of black ink from ink remains			Inks / Solvents		Spent ink		
	Dispensing system			Inks / Solvents	■	Ink remains / Packaging	■	■
FINISHING	Use of water-based glues	■			■	Hazardous waste		
AUXILIARY OPERATIONS	Substitution of cleaning solvents (water emulsions and vegetable esters)				■	Hazardous waste		
	Automatic cleaning of tools	■		Solvents / Rags	■	Spent cleaning liquids / Rags	■	
	Installation of an evaporator	■				Spent liquids from film and plates Spent liquids from cleaning		
	Recovery of solvents			Cleaning solvents		Spent solvent Fountain solution		

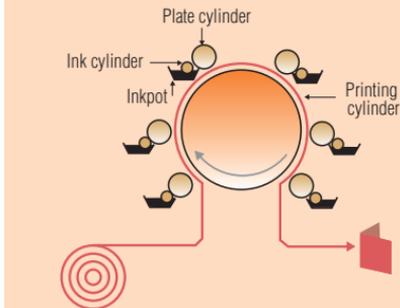
\* IPA = isopropyl alcohol

# Printing processes I

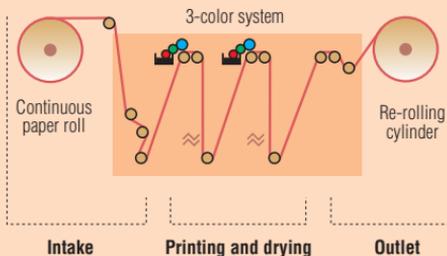
## 1 Offset



## 2 Embossing

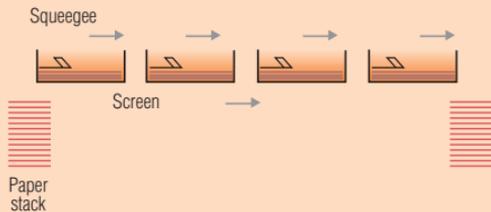


## 3 Flexography

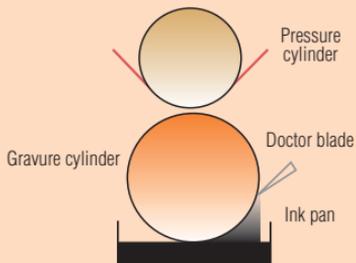


## Printing processes II

### 4 Screen printing



### 5 Rotogravure



## Waste streams generated

PRE-PRESS	<b>AIR EMISSIONS</b>	VOC emissions from composition and cleaning of film and heat hardening of the plates Ammonia vapors from ozalids
	<b>LIQUID WASTE*</b>	Spent chemicals from film processing Rinse water from film processing Spent chemicals from plate processing Rinse water from platemaking
	<b>SOLID WASTE</b>	Used film Used plates Composition paper Spent filters and cartridges Spent toners
PRINTING	<b>AIR EMISSIONS</b>	VOC during the preparation, application and drying of inks Emission from the fountain solution
	<b>LIQUID WASTE*</b>	Spent fountain solution Spent ink and varnishes
	<b>SOLID WASTE</b>	Printing support (paper, plastics and others) Rubber blankets (only offset) Metallic and plastic containers
FINISHING	<b>AIR EMISSIONS</b>	VOC from solvent-based glues
	<b>LIQUID WASTE*</b>	Spent glues
	<b>SOLID WASTE</b>	Scrap paper, plastics and others
AUXILIARY OPERATIONS	<b>AIR EMISSIONS</b>	VOC from cleaning solvents
	<b>LIQUID WASTE*</b>	Spent cleaning solvents Cleaning wastewaters Used mineral oils
	<b>SOLID WASTE</b>	Packaging wastes Cleaning rags General factory wastes Sludge from wastewater treatment

\* Liquid waste can also be internally treated as wastewater.

## **Mediterranean Action Plan**

### **Regional Activity Centre for Cleaner Production (RAC/CP)**

Paris, 184, 3a planta - 08036 Barcelona (Spain)  
Tel.: +34 93 415 11 12 - Fax: +34 93 237 02 86  
E-mail: [cleanpro@cema-sa.org](mailto:cleanpro@cema-sa.org)  
<http://www.cema-sa.org>



UNEP



Regional Activity Centre  
for Cleaner Production



Ministry of the Environment  
Spain



Government of Catalonia  
Ministry of the Environment  
and Housing