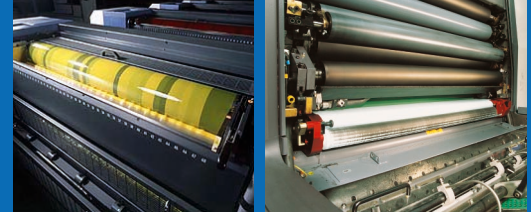




Washing and Cleaning Solutions for Offset Printing



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Function

Washing and cleaning solutions for use in offset printing are mixtures of different, chemical compounds such as hydrocarbons, solvent naphthas, oils, tensides, corrosion inhibitors and others. The different compositions of the washing solutions are adjusted to the specific intended use.

Adjusted to printing inks

Conventional printing inks
UV-curing inks
Hybrid inks
Dispersion varnishes

Adjusted to fields of application

Sheet-fed offset printing
Coldset
Heatset

Adjusted to special applications

Rubber materials EPDM, NBR
Damping rollers
Brush rollers
Impression cylinders
Cleaning of parts

A material compatibility of the washing solutions must be guaranteed for contact with all system components such as machine parts, machine coatings, tubes, seals, rubber materials and printing plates.

Application

The regular cleaning and maintenance of the printing machine is one of the most important conditions for the trouble-free production course at the end of which a satisfying printing result is expected.

The washing solution will etch printing ink components. Washing solutions mixed with water will remove the water-soluble accumulated dirt (such as paper components) together with the printing ink.

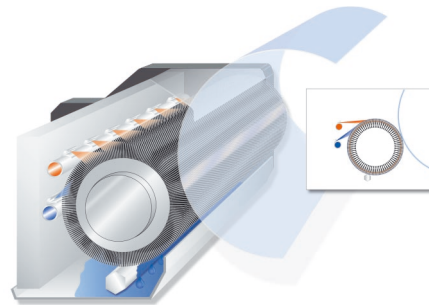
Automatic washing units (s. illustration) such as brush or blanket washing units are meanwhile standard equipment for the cleaning of blankets. A considerable amount of time, expenditure and washing solutions is the result when they are used.

For use in heatset printing further regulations are to be observed for the washing solution, as the inks are heated in the continuous-flow drier far above the flash point of their solvents. Up to 85% of the solvents will evaporate. Oxygen will get into the interior of the

drier through the opening and will mix with the vapours. In order to avoid the risk of an explosion the air is sucked out.

The washing solution and

the maximum throughput when washing the blanket have to be adapted to the exhaust volume of the ventilation of the drier.



Inking rollers or ink fountains are cleaned with undiluted washing solution as in this case only inks will have to be dissolved. In addition it is recommended to use roller cleaning paste especially in case of an ink change from dark to lighter colour tones in order to achieve a fast and effective cleaning.

The use of a cylinder cleaning paste is recommended for cleaning soiled metal surfaces. The paste will remove all residues and will protect the surface of the cylinder against resoiling.



In the course of time components of paper and ink will deposit on the rollers which can cause considerable

trouble in the printing process. Especially calcium carbonate will considerably influence the emulsion behaviour and ink transport. Special cleaning solutions adjusted to this task will be able to remove residues of this kind.



Conscious use of washing solutions

The use of cleaning solutions is connected with dangers and risks for the human being in the environment in many cases. The data on the technical data sheets, safety data sheets and product labels should therefore always be observed.



On 3rd October 2002 the ordinance regulating the working safety came into force. It replaces the ordinance on combustible liquids, the ordinance on the use of work equipment and the ordinance on the use of electrical installations in hazardous locations. Combustible liquids are differentiated only according to characteristics of hazard according to the laws concerning hazardous material. The classification in classes of hazard according to the ordinance on combustible liquids into A1, A2, A3 and B is dropped (s. table).

Flash point	Hazardous characteristic according to ordinance on hazardous material	Former classed pf hazard according to the ordinance on combustible liquids	Type
< 0°C	Highly inflammable	A1	Special grades of petroleum spirit
< 21°C	Easily inflammable	A1	Special grades of petroleum spirit
21°C – 55°C	Inflammable	A2	White spirit
55°C – 100°C	None	A3	White spirit
> 100°C	None	---	High-boiling
> 150°C	None	---	Cleaning solution on vegetable oil basis

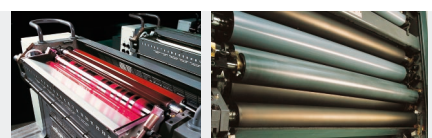
Environment and health

Due to its high degree of volatility VOC-containing washing solutions are criticised to an increasing degree. The environmental consciousness increased, the natural resources decrease.

This is why leading producers and suppliers of washing solutions, printing inks, printing rollers, blankets and blanket washing units and the employer's liability insurance association "Printing and Paper Converting" signed the "Trade initiative for reducing solvent emissions in offset printing" already in 1995.

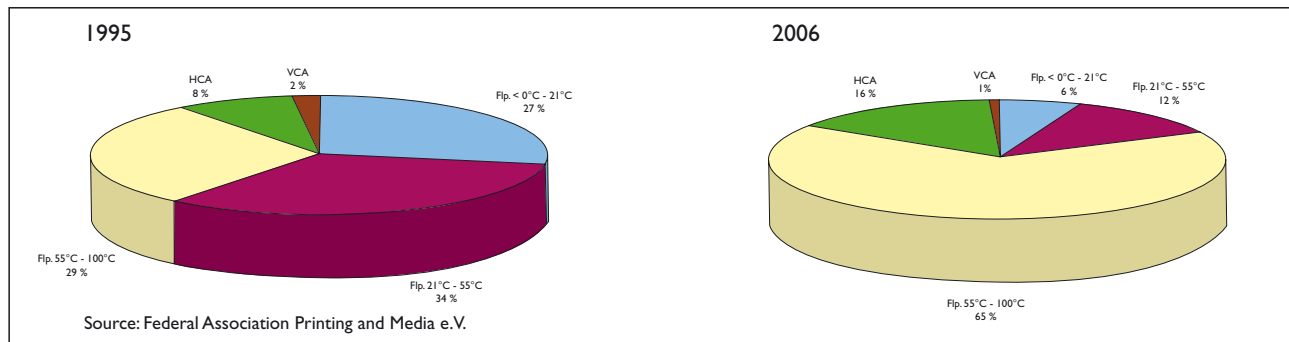
They explicitly aimed at the following: Reduction of the emissions in offset printing by recommendation and offering alternative washing and cleaning solution.

The success is something to be proud of. If the amounts of the different washing solutions used now are compared with those used in 1995, a clear trend to washing solutions with a higher flash point can be seen and this means the aims aimed at were realized.



Consumption of washing solutions

Trend of developments 1995 to 2006



This positive development continues.

Technical release of cleaning solvents

Since 1995 the following criteria are valid for the release tests of washing solutions in offset printing:

- Flash point > 55°C
- Benzole content < 0,1 %
- Toluol and Xylol content < 1%
- Aromatic compounds (> C₉) < 1%

The following substances must not be contained any more:

- Halogenated hydrocarbon
- Terpenes
- n-Hexane
- secondary amines and amides
- toxic and dermatological questionable substances.

All washing solutions corresponding to the above-mentioned criteria are certified by the FOGRA institution after having been thoroughly tested and are then released by the machine manufactures for use with their machines and plants.



Advantages of certified washing and cleaning solutions:

- Improved health protection. A clearly reduced pollution of the air we breathe.
- Improved safety by reduction of fire and explosion risks.
- Environmental and user friendliness by reduced VOC-emissions.
- Protection against corrosion.
- Reduced consumption.
- Possibility of processing and reutilization.
- Less costs.

Recycling of used washing solutions

The trend to recycle used washing solutions is increasing. This is mainly done by vacuum distillation or different possibilities of filtering. Most of our washing agents can be processed by distillation or filtration. If you have got any questions concerning this topic, we'd be please to give you advice.

Washing and Cleaning Solutions for Offset Printing

Examples for the evaporation (volatility) of offset washing solvents:

Washing solution on the basis of Special grades of petroleum spirit	Flash point 0° C	Evaporation number 2,6
White spirit	40° C	35,4
White spirit	60° C	154,5
High-boiling solvent	100° C	2751,5
Cleaning solvent on vegetable oil basis	> 150° C	> 3100,0

Remark: The smaller the evaporation number, the faster the volatility of the washing solution.

Tip: By the fast evaporation of a washing solution with low flash point the quantity used will increase!

Our product range

The users of our products will profit from long years of intensive development work and our comprehensive know-how. When choosing the raw materials we will consider the efficiency of the final product but also the in each case latest findings concerning the safety of the user and the environmental compatibility. We regularly exchange views with users, machine builders, employer's liability insurance associations, the FOGRA institution and raw material manufacturers and use their findings and requirements in the development of our products.

Our range of products includes both standard washing solutions (Schwego® Mat, Schwego® Clean), and special cleaning agents for blanket and printing rollers (Schwego® Plus, Schwego® Cream), metal surfaces (Schwego® Super, Schwego® Dur) or printing plates (Schwego® Aktiv).

Future challenges

On the one hand crude oil is something you cannot do without as universal raw material in the industrial society of the 20th and 21st century. On the other hand crude oil is a transitory resource. This is why we keep on working on alternatives for washing solutions based on mineral oil in the field of washing and cleaning solutions for the printing industry.

Vegetable oils have been used in a limited scope for quite a number of years now. Alternatives such as microemulsions or neutral and alkaline, aqueous cleaning solutions are quite promising. The up to now positive scope of effectiveness of these cleaning solutions is continuously developed further by us.

When developing our products we consider environmental compatibility, working safety and material compatibility apart from efficiency as important cornerstones. Our most important aim is the reduction and substitution of harmful substances. This is why we always endeavour to adapt the composition and handling to the latest findings when choosing our raw materials, producing our products up to the use of packaging materials.



Our washing and cleaning agents meet the EC-Detergent ordinance

On 08th October 2005 the ordinance (EC) No. 648/2004 of the European Parliament and Council of 31st March on detergents came into force. Tenside-containing washing and cleaning solutions are called detergents in the sense of this ordinance. Among them are also washing and cleaning agents for sheet-fed and web offset. The tensides contained in our washing and cleaning solutions meet the requirements of biodegradation as laid down in the ordinance (EC) No. 648/2004 on detergents.

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Terms often used in connection with washing solutions

Flash point

The flash point (Flp.) indicates the lowest temperature at which a solvent vapour/air mixture can be inflamed by means of a pilot light.

VOC

Volatile Organic Compounds. All volatile, organic compounds which will evaporate in the atmosphere. According to the VOC-guideline all those compounds are included which have got a steam pressure of at least 0.01 kPa at a temperature of 20°C,

Evaporation number

Dimension number for the volatility of liquids.

Vapour pressure

The pressure which the steam (liquid of solid phase) exercises on the surrounding walls in a closed container.

Workplace limiting value

The workplace limiting value is the limiting value for the chronologically important average concentration of a substance in the air at the workplace with reference to a given reference period. It will indicate at which concentration of a substance in general no acute or chronic hazardous effects on health can be expected.

Explosion limit

Flammable gazes or vapours mixed with air are potentially explosive within a certain range of concentration. This range of concentration is determined by the lower explosion limit and the upper explosion limit. Each effective ignition source can trigger an explosion within this range of concentration.

Aromatic compounds

Collective term for aromatic hydrocarbons, especially benzoles and alkylbenzenes. The efficiency of a washing solution is increased by the use of aromatic compounds. At the same time, however, the risk for the user's health will increase.