Explaining the Present Parameters for Safety and Climate Considerations as Necessary Prerequisites for Digital Printing

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Abstract

The most important factor is an integral approach for the digtal environment. Therefore the location of production should be certified by ISO 14001, should be energy efficient and should guarantee a sustainable use for necessary resources. All products should be FSC, TCF, PEFC certified and should carry an ECO label and should fulfill the requirements to be CO2 neutral and the carbon footprint should have been calculated for the customers. How do fulfill these points will be described in the paper. Therefore a holistic approach is necessary. The design of the digital printing plant and the digital printing equipment used are very important and also the used materials especially paper and toner must fulfill all requirements. Only paper with suitable paper profiles can be used. To get digital printing also in a better environmental position in the next five years the specific energy should be reduced by 15%, cO2 emissions by 15%, total COD and AOX emissions by 30%. Especially for packaging also the TRS emissions should be reduced by 50% and total waste to landfill should be reduced up to 20% and hazardous waste should be eliminated totally. Also for digital printing " The Global Compact Program" of United nations is an important framework for business aligning their operations and strategies with 10 universally accepted Principles covering human rights, labor and anti corruption is one point. Also WBCSD a CEO-led global association of around 200 companies committed to sustainable development is a vital necessity for digital printing in future. The overall framework to reach these goals will be explained and will be transferred for the digital printing industry.

Austrian Eco-Label for printed Paper Products

The objectives of The Austrian Eco Label (AEL) are a better orientation for the consumers on the point of sale. It was designed to motivate producers and traders to develop and offer less environmental-polluting products. It was mainly designed for offset printing and since the last ten years dry toner digital processes and in the last year also inkjet was put to the framework of AEL.

Consumption of raw materials
Toxicity of contents
Emissions (e.g. exhaust gases, sewage, noise)
Disposal/recycling
Distribution and transportation
Quality, safety

European Eco Label for printed products

Eco labels and green stickers are labeling systems for food and consumer products. Eco labels are often voluntary, but law in North America for major appliances and automobiles mandates green stickers. They are a form of sustainability measurement directed at consumers, intended to make it easy to take environmental concerns into account when shopping. Some labels quantify pollution or energy consumption by way of index scores or units of measurement; others simply assert compliance with a set of practices or minimum requirements for sustainability or reduction of harm to the environment. Usually both the precautionary principle and the substitution principle are used when defining the rules for what products can be ecolabelled. (Wikipedia)

Eco Labeling systems exist for both food and consumer products. Both systems were started by NGOs but nowadays the European Union have legislation for the rules of ecolabelling and also have their own **Eco labels**, one for food and one for consumer products. At least for food, their is nearly identical with the common NGO definition of the rules for ecolabelling. Since 2012 also a new Eco Label for printed paper products was developed it can be used also for digitally printed products and will be released in summer 2012

Figure 1 *The new seal for environmetal friendly printed products in Europe*

Overall considerations

1.Global Warming Potential (GWP) is a measure of how much a given mass of greenhouse gas is estimated to contribute to global warming. It is a relative scale, which compares the gas in question to that of the same mass of carbon dioxide. Relevant non-CO2 greenhouse gases for the pulp and paper industry are N2O (GWP 310) and CH4 (GWP 21). The emission of all relevant greenhouse gases is expressed as the equivalent amount of CO2, given as CO2 equivalents, abbreviated as CO2e.

2. Chemical Oxygen Demand (COD): The amount of oxygen required to degrade the organic compounds of wastewater, commonly used to measure the amount of organic compounds in water. COD refers to total COD in receiving waters after treatment, measured in tones.

3. Adsorb able organic halogens (AOX): Expresses the amount of chlorine-bound organic substances in waste water.

4. Total Reduced Sulphides (TRS): Reduced sulphur compounds. TRS is a gaseous mixture of compounds consisting mainly of hydrogen sulphide H2S in the paper and packaging industry. TRS compounds produce offensive odors.

Tools

FSC® Vision: *"The world's forests meet the social, ecological, and economic rights and needs of the present generation without compromising those of future generations."*

Facts: More than 100 million ha in 79 countries are FSC certified. The revenue of products FSC certified is about 20biilion USD.

PEFC - Programme Forest Certification schemes for the Endorsement of Non-profit, non-governmental Organisation since1999 PEFC™ has25 certifying systems global194, 38 mio ha forest are PEFC™ certified (2007) 2/3 in North America and one third in Europe 4204 global certified organisations

Der CO_2 footprint is a free evaluation of the CO_2 emissions of products

10 toes of CEPI

1.Carbon sequestration in forests 2.Carbon stored in forest products 3.Greenhouse gas emissions from forest product manufacturing facilities 4. Greenhouse gas emissions associated with producing fibre 5. Greenhouse gas emissions associated with producing other raw materials/fuels 6. Greenhouse gas emissions associated with purchased electricity, steam, heat, and hot and cold water 7. Transport-related greenhouse gas emissions 8. Emissions associated with product use 9. Emissions associated with product end-of-life 10. Avoided emissions

Digital Printing systems

The main suppliers like Minolta, OCE, Canon , Xerox, Ricoh are marked with AEL and the Blue Angel. Also all main digital printing units like XEROX, Canon, Minolta, OCE and Ricoh are certified printing units. The main parameters therefore are environmental friendly toners, energy consumption especially by starting the printing process and also emission of ozone and CO2 consumption. The criteria's for electro- photographic dry toner are also used for "The Blue Angel" in Germany

Criteria for digital printing

The goals for recycling and deinking are therefore: Toners have to be deinkable and for deinkability appropriate test methods are necessary e.g. INGEDE –Test methods or practical mill tests. Toner containers must be able to be reused or supplied to a material recycling scheme. Also in most of the other Environmental signs Nordic Swan, Eco Mark of Japan and Blue Angel deinking is an important factor too.

Toner

Toner must be free of substrates with any of the following risk phrases:1.dangerous to environment 2.toxic (T) very toxic(T+) 3.carciogenic(T), mutagenic (T) or reprotoxic (T) .Toner must not contain heavy metals like lead, cadmium, mercury and chromium VI and toner shall give a negative AMES test. AEL, Blue Angel, Nordic Swan, European Eco-Label and the emission limits derived from EU Eco-Label " graphic and copy paper". A scoring system is used for calculation

Conclusions

The above-mentioned safety and health regulations are for the certification processes in digital printing vitally necessary. But now most of the printing plants have no problem at all with the regulations and can fulfill all above-mentioned criteria's.

Especially paper industry has done a lot for the sustainability and all safety and climate considerations are fulfilled from a lot of paper mills especially in Europe. A lot of work has to be done still in energy consumption, reduction of CO2, reduction of the use of special chemicals and elimination of all hazardous and carcinogenic chemicals. Especially the new Eco Label for printed products will emphasize these goals very much and force printers, paper mills, chemical suppliers and ink and toner companies to produce their products according the new regulations.

References

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