

SURVEY OF THE PCP PROPERTIES  
EVOLUTION OF THE EUROPEAN LEGISLATION

by

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## 1. INTRODUCTION

Quite recently, PCP has been accused of being so dangerous to man and the environment that it should be banned. The German government has even drafted a Statutory Ordinance which, if approved by the European Commission, would have prohibited any use of PCP.

We would like to briefly review \* the potential impact of the use of PCP in the wood treatment industry and give an overview of the European situation.

As usual, in the following paper, the term pentachlorophenol (PCP) will be used in a general sense, meaning pentachlorophenol itself as well as tetrachlorophenol or their sodium salts or mixtures thereof.

## 2. PCP PROPERTIES

### 2-1 The dioxin issue

Let us first consider the dioxin issue which is emotional and goes far beyond sound scientific knowledge. PCP has often been said to contain dioxin which is the most toxic substance known to man.

This statement is quite inaccurate, in fact, among the 75 chlorodibenzoparadioxins (PCDD) that can theoretically exist:

- PCP never contains 2,3,7,8 TCDD, the so-called SEVESO dioxin which is effectively highly toxic on animals. The chlorination process used for the PCP synthesis makes the appearance of this SEVESO dioxin impossible.

- PCP contains traces of other products of the dioxin family, mainly hepta and octachlorodibenzoparadioxin (H7CDD and OCDD), which are considerably less toxic than the SEVESO dioxin.

\* the properties of PCP have already been presented at the 1987 BWPA annual meeting.

In fact, according to the 1987 EPA recommendation only two impurities are of concern: hexachlorodibenzoparadioxin (H6CDD) and hexachlorobenzene (HCB). Our commercial products comply with the EPA regulation:

- No SEVESO dioxin: not detectable at 1 ppb
- H6CDD < 4 ppm (in 1989)
- HCB < 75 ppm

### 2-2 Potential risk for humans

The toxicological properties of PCP are extremely well documented, and we would like to outline the main features:

- PCP undisputably presents acute toxicity and has, for example, to be classified as toxic according to EEC rules. However its toxicity is not unusual for a chemical product, and is in the same range as other wood treatment products such as MBT, TBTO or TBTN. Moreover, PCP is generally used at a 3 to 5 % concentration and the toxicological effects of PCP based formulae will be reduced roughly in the same proportion.

- PCP is a skin irritant as are most of wood preservatives. On the other hand it is not a skin sensitizer and therefore cannot induce allergies.

- Another very important factor is the fact that PCP has no long term toxicity: it is not teratogenic, mutagenic or carcinogenic.

The occupational hazard associated with the use of PCP in the wood industry has been evaluated in great detail. Recommendations have been put forward by industrial hygienists. For example, in the US, the ACGIH has recommended that the PCP content in the air should not exceed 500 µg/m<sup>3</sup>. Measurements taken over many years have proven that under normal working conditions, this recommended level is respected: experimental values vary from a few µg/m<sup>3</sup> to 200 or 300 µg/m<sup>3</sup>. This absence of risk when properly handled has been demonstrated by its use for more than 40 years in the wood treatment industry.

Of course, there may be some risk associated with PCP when used by non professionals without proper precaution, for example in a closed area without ventilation, or in contact with food.

In conclusion, PCP, as any efficient wood preservative, presents a potential risk if misused, but it has been proven that its current use in the wood treatment industry is safe.

### 2-3 Potential risk for the environment

Like any biocide, PCP is necessarily ecotoxic, and has proven to be very efficient in controlling the development of various noxious species: algae, bacteria, fungi, molds, etc. Those properties have made PCP extremely useful for wood treatment especially in hot and wet climates, and where the wood species have poor seasoning properties.

The counterpart of this efficiency is that PCP is also toxic to fish. And even if it is less ecotoxic than most of other proposed substitutes, it should not be discharged in rivers.

However, the extent of the risk for the environment has been greatly exaggerated. PCP is not rapidly degradable, otherwise it would not insure long term protection. But there are degradation mechanisms such as biodegradation by adapted bacteria, or rapid photodegradation on the water surface into non ecotoxic chemical compounds. It should also be pointed out that contrary to what has been found in laboratory tests in acid media, recent experiments on fish have proven that PCP is not bioaccumulable.

In fact, it is the wood treatment itself which is potentially hazardous for the environment since it necessitates the use of ecotoxic compounds to be effective. Therefore, precautions must be taken in order to avoid water contamination. Compliance with a Code of Practice, as already provided by several countries, should be observed in order to avoid chronic or accidental pollution. This is especially true for the antisapstain protection where the risk is greater than in the extended preservation, due to the use of aqueous solutions.

### 3 - EVOLUTION OF THE EUROPEAN REGULATIONS

PCP is used worldwide as a wood treatment product and various countries have passed legislation to regulate this use. It would be tedious to give even a brief survey of these, therefore we will outline only the latest developments in the EEC and offer some general principles which should, in our mind, be embodied in the regulations.

Since 1985, when the last German company stopped its production, RHONE-POULENC has been the only European PCP

producer. The major consuming countries are in southern Europe for antisapstain (as PCP-NA) and GREAT-BRITAIN for extended preservation (as PCP-OL).

In early 1987 the Federal Republic of Germany (FRG) government drafted a Statutory Ordinance to prohibit completely trade and handling of products containing more than 5 % of PCP, or of wood containing more than 5 ppm of PCP. As it is now mandatory in the EEC (EEC Directive 83/189), the FRG government notified the European Commission (May 21, 1987) of its intention to ban PCP.

In September 1987, as a result of the objections of Great Britain and France, the European Commission told FRG not to enforce its proposed ban and decided to pass a Directive to regulate the use of PCP throughout Europe.

In April 1988 the draft of the Directive was published (Document 88/C 117/11). It states:

- the use of PCP in general, is not allowed;
- the industrial use of PCP is allowed for wood treatment, heavy duty textile treatment and chemical synthesis.

Now, at the end of 1988, the draft of the Directive is under examination by the European Parliament and should be adopted by the end of 1989. Therefore PCP and of course wood treated with PCP will be legally accepted throughout Europe, Germany included.

The reason why Germany did not succeed in trying to ban PCP are numerous, however two out of these reasons seem to be most important:

- The FRG government has recognized, even in its notification to the Commission, that there was no scientific proof of the adverse effects of PCP. Furthermore they were promoting German products which happen to be more hazardous than PCP.

- there is no valid substitute of PCP (especially of PCP-NA) at this time. Professor Willeitner from the German Wood-institute in Hamburg remarked during the last BWPA meeting (Cambridge 29/6/1988):

"The total prohibition of PCP will involve problems for prophylactic treated imported wood because so far no adequate substitute seems to be available".

#### 4 - FUTURE OF PCP

To propose a ban on the use of PCP, as it has been asked by Germany, and to replace it by substitutes which present at least a similar risk and lower cost efficiency is not a realistic solution as evidenced by the EEC rejection.

However, PCP like any other wood treatment product, must be used in compliance with the rules of Good Practice intended to protect wood product industry workers and the environment.