European Timber Treatment Issues and Trends

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Abstract

Driven by regulatory and economic forces, the European wood industrial preservation currently undergoes massive changes. New technologies are coming onto the market or are under investigation to meet the future challenges. This paper reviews the current regulatory framework as well as the chances and challenges associated with some of these technologies in industrial wood preservation: copper amine systems, particulate copper systems, metal free biocidal and non-biocidal technologies.

Wood preservative manufacturers have to face the fact that only a very limited number of active ingredients will be available in the future. All of them will have their shortcomings and we need to employ new ways to combine and formulate them to make modern wood preservatives better.

A „one-size-fits-all“ preservative is becoming less likely and we believe we are moving to a more tailor-made approach.

Introduction

The European Wood Timber treatment industry currently undergoes massive changes. Wood preservative manufacturers and treaters are being increasingly confronted with the requirements of the European Legislation while at the same time new technologies are coming onto the market as a potential competition. Twenty years ago mainly the national legal requirements formed the statutory framework for our industry with the European Legislation being perceived as far away from everyday life. Today the European Legislation through a number of regulations and directives has a dominant impact on the production and use of wood preservatives and treated wood as well. Namely the Biocidal Products Directive (98/8/EC), the VOC Directive (1999/13/EC) and the new European Chemicals Policy REACH (EC 1907/2006) influence the suppliers of wood preservatives. In addition to these, users of wood preservatives are facing further requirements in future due to regulations in the European Pollutant Release and Transfer Register (EC 166/2006)) and the Integrated Pollution Prevention Control (EC 96/61). With regard to treated wood the Construction Product Directive respectively the new Construction Products Regulation together with related European Standards (e.g. EN 14081 and prEN 15228) continue to pose new challenges for the industry.

European Legislation

In the last 10 years the European market for wood preservatives was changed massively in particular driven by the Biocidal Products Directive (BPD) which entered into force on 24 May 2000. The central aims of the BPD are to harmonise the European market for biocidal
products and their active substances so that once a product is authorised in one Member State under the Directive, this authorisation will be recognised in other Member States; to provide a high level of protection for people, animals and the environment through risk assessment; to ensure products are sufficiently effective against the target species. The scope of the BPD is very wide, covering 23 different product types. These include disinfectants for home and industrial use, preservatives for manufactured and natural use, non-agricultural pesticides for use against insects specialized products such as antifouling products. The two product types chosen to be the first ones that have to go through the system are rodenticides (Product Type 14) and wood preservatives (Product Type 8). At the time, when the industry had to prepare and submit the required data dossiers for these two product types the approval process was not finally defined and a lot of problems and open questions surfaced in the meantime. Still a number of issues are unsolved, requirements and data are handled or interpreted differently by the different national authorities and it is not exaggerated to say that the two product types act as a kind of guinea pig for this totally new process.

In a first phase that started in 2000, all active substances existing on the market when the BPD came into force had to be reviewed to ensure they can be used without unacceptable effects to people, animals or the environment. Industry could either identify or notify active substances. Identification was combined with a quite basic data dossier only, whereas a notification with a full supporting dossier was intended to ensure the commitment by the industry to hold this active on the market in the long term. As a consequence wood preservatives containing active substances neither being identified nor notified had to be removed from the EU market by 14 December 2003. Products based on identified but not notified actives had to be removed from the market by 1 September 2006. A notification of an active substance based on a full data package, enables products to be placed on the market until the review has been completed.

In a second phase (started 1 January 2009) the products approvals will be evaluated only for those products containing active ingredients which passed the review and are included in Annex I to the Directive. At this stage the first review program already led to a significant reduction of the number of active substances which are still allowed to be used in wood preservatives. From 81 active substances originally notified, only for 40 actives a full data dossier was submitted and a further reduction may be expected before final Annex I listing. Potential toxicological or environmental effects of active substances are evaluated through the whole life-cycle of wood preservatives with a focus on industrial preventive treatments and treated wood in service. As a result of the review some more general restrictions and some more specific restrictions for single actives became evident. For example, after the actual products obtained their approval under the BPD, there will be a general requirement for freshly treated timber to be stored under shelter or an impermeable hard standing to prevent direct losses to soil or water and any losses must be collected for reuse or disposal.

After almost 10 years of experience with the BPD many questions were left unanswered during the review program for active substances and decisions were postponed to the product approval phase because the member states could not agree on a common position.

In spite of the great uncertainty, the industry has now to start working on the first product dossiers and is still facing a lot of problems. The risk assessment for products is not clear especially with regard to wood preservatives based on multiple-actives - which is the majority
of all products. From an industrial point of view more realistic exposure and emission data should be used in evaluation scenarios. The concept of mutual recognition as a key element for a harmonised approval system is not defined yet. Disproportional data requirements connected with higher costs for further testing giving little additional information for the evaluation are in discussion and approval costs still vary to a great extend between the member states. Imported articles (i.e. treated wood from outside the European Union) are not affected by the BPD and so far it cannot be foreseen whether or not this will be regulated.

So for the suppliers of wood preservatives the BPD is the most important European Directive. A second regulation influencing the formulation work is the new European Regulation of chemicals and their safe use (REACH – 1 January 2007). Herein the registration of substances manufactured in or imported in the EU in annual quantities of more than one tonne per company is regulated. REACH is a big issue for the whole chemical industry.

At the treaters level the BPD and REACH are perceptible in the products they are allowed to use. The now beginning product approval process under the BPD requires suppliers to demonstrate that there will be no unacceptable risk to man and the environment. Herein any risk mitigation measures which may be required as a result of the risk assessment at a treaters site as well as during the transport, storage or use phase of treated wood will be specified and so a high overall level of protection for human health and the environment will be achieved.

In parallel to the risk mitigation measures resulting from the BPD process the question of emissions in treatment plants will also be regulated in future under the scope of the new European Directive on industrial emissions (IPPC). The IPPC Directive combines seven existing pieces of legislation on industrial emissions into one single Directive. Another target herein is to improve and clarify the concept of “Best Available Techniques” (BAT) as a key element to evaluate emissions and to use those as a basis for permission of any industrial plant under the IPPC. The scope of the new IPPC Directive will be extended and it can be expected that treatment plants with a production capacity exceeding 50 m³ per day will be included in future. It is argued that treatment plants are included in the E-PRTR Regulation and should therefore be also fall under the scope of the IPPC Directive. The E-PRTR, the new European Pollutant Release and Transfer Register, is a tool for providing public access to information on releases of pollutants and off-site transport of pollutants and waste in the EU.

Today the treatment industry is already following the BAT concept by the use of national Timber Treatment Installations Code of Practices for safe design and operation. The European Wood Preservative Manufacturers Group (EWPM) intends to produce an EU wide Code of Good Practice in 2009 which could be used as the basis for a reference document on BAT in the treatment plants. However, the BPD already requires the highest level of protection for human health and the environment and therefore no further benefits are to be expected by the IPPC. Instead only further administrative work and costs to operators will be a consequence.

As industry it is important to be involved in the process of establishing new regulations for wood preservation. The industry is committed to market and supply safe products and treaters have to use them safely including a safe storage of the treated timber.

To conclude the discussion of the legislation issues an impact on treated wood is given by the Construction Products Directive (CPD) and in future by the new Construction Products Regulation. A main target herein is to remove all remaining regulatory and technical obstacles to the free circulation of construction products in the EU. The use and meaning of the CE
marking of construction products is regulated for a free circulation and use of CE marked material. Based on harmonised European Standards as the main tool a common technical language for manufacturers, users and Member States is introduced. In the relevant European Standards the EN 14081 “Strength graded structural timber” and the prEN 15228 “Structural timber preservative treated” are of importance.

For structural timber a single piece CE marking will be obligatory as from 1 September 2009. For preservative treated structural timber the CE marking for the treatment will be batch wise. In context with the CPD the definition of an expected service life for wood and treated wood is required. This is still an open question and discussions are ongoing on different levels.

**European Market Situation**

Modern wood preservatives have to meet a range of different requirements. The effective protection of wood from biological decay is one important requirement, but at the same time regulators, authorities and the industry are also looking to restrict the use of chemicals in general and biocides specifically to those areas where they are absolutely needed and to minimize any possible adverse effects to humans, animals or the environment. The above mentioned European Legislation and the toxicological discussions on nano-sized materials set strict barriers to the production and use of wood preservatives and already today have significantly restricted the number of active ingredients available from Europe. Partly this may be attributed to the high costs, resource requirements and financial risks associated with obtaining registration for a biocide as wood preservative.

In the last 50 years inorganic wood preservatives based on copper, chromium and arsenic, phosphorous or boron salts (CCA, CCB, CC or CCP) have been dominating in industrial wood preservation. However, due to environmental and/or toxicological concerns on both Arsenic and Chromium the use of these compounds in wood preservatives has been banned or restricted in many countries around the world. In Europe neither the notification for Arsenic nor Chromium has been supported under the Biocidal Products Directive. Therefore wood preservatives containing Arsenic of Chromium as active ingredients are not allowed to be used or marketed after 1 September 2006 and have largely been replaced by copper amine systems today. In some countries, like Sweden, this change took place even earlier, between 1991 and 1994 [1].

The disappearance of the relatively inexpensive and effective copper chromium preservatives also opens up windows of opportunities for some further new or not so new technologies. We will review the status, chances and challenges of the most important ones for wood used in outdoor applications in the coming chapters.

**Copper Amine Systems**

Today, copper containing products have largely replaced copper chromium based preservatives and have become the dominating industrial wood preservative. First they replaced CCA in UC 3 applications, but now they are used more and more even in high hazard applications like utility poles. The insoluble copper salt (the main active ingredient) is solubilised using alkyl amines or ammonia. In all commercial products on the market, copper

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1 Note that Chromium-containing wood preservatives can stay on the market under certain circumstances if the competent authority accepts that chromium is not an active in a specific product.
is combined with one or more co-biocides to improve the performance, namely Cu-HDO (Bis-(N-Cyclohexyldiazeniumdioxy)-copper), quaternary ammonium compounds (quats), triazoles (Tebuconazole, Propiconazole) and/or boron compounds.

After 20 years of commercial experience one can state that copper amine systems match the performance of copper chromium treated wood by and large, though there are some specific differences between the preservatives. Copper amine systems in general are somewhat more susceptible to deviations in composition, wood moisture, treatment parameters and treated wood storage conditions. However, still all important performance criteria like durability of the treated wood, penetration of the preservative, corrosivity, resistance against mould during wood storage etc. can be well met, provided the preservative and the treatment conditions are chosen properly.

There remain two major disadvantages of copper amine systems compared to copper chromium salts. Firstly, they are all considerably more expensive in terms of chemical costs per m³ treated wood. In recent years these costs have even increased driven by a dramatic price increase for copper and also oil based products like the alkyl amines. To what extent the current economic crisis will keep raw material costs at a reduced level cannot be foreseen whereas it is obvious that significant costs will burden the suppliers due to the BPD approval costs. Secondly, all copper amine systems require higher loadings of copper in the treated wood compared to CCA (Figure 1). It can also be seen that there are significant differences in the effective copper retention depending on the formulation and the co-biocide. This higher copper loadings result in higher absolute emissions of copper from the treated wood into the environment. Though the toxicity of copper is relatively low towards most organisms including humans, copper is toxic to some aquatic organisms at concentrations that can be reached in certain exposure situations near treated wood. This may lead to restrictions of copper containing wood preservatives in some applications of treated wood in the future.

Both disadvantages can be addressed by either reducing the amount of copper required in the treated wood and/or by reducing copper leaching from the treated wood. Therefore much research is dedicated to optimize efficacy and leaching of actives.

![Figure 1: Comparison of NTR approved product retentions in Use Classes 3 (above ground) and 4 (ground contact) in terms of kg copper per m³ treated wood (modified after [2]).]
One approach to reach the latter goal is to use small, insoluble copper particles without complexing agents like alkyl amines. These products are covered in the next chapter. But also in copper amine systems research is aimed at a) reducing the level of copper by combination with the most effective co-biocide(s) and/or adjuvants and b) reducing the leaching of copper by optimization of the formulation [3].

**Particulate Copper Systems**

In the last years there has been an increasing interest in particulate “nano” or “micronized” copper systems. In these, small and insoluble copper particles are finely dispersed in water. Also the organic co-biocides may be used as micro dispersions or as liquid micro emulsions like in some copper amine systems or metal free systems (cf. below). Since 2006 such systems are marketed in the US by at least 3 different suppliers and more recently they were also introduced in some European markets. The perceived advantages are reduced leaching of copper from treated wood, lower corrosivity of the treated wood towards metal connectors and replacement of the relatively high level of alkyl amines by smaller amounts of surfactants/dispersing agents. The principle of these systems is that the copper particles are much bigger than in copper amine complexes (typically around 200 nm average particle diameter compared to 0.2 nm for a copper-amine complex). The kinetics of dissolution depends on the accessible surface and therefore the dissolution (i.e. leaching) of larger copper particles should be much slower for these systems compared to finely dispersed copper amine complexes, bound or precipitated at the inner wood cell surfaces.

On the other hand it is clear that penetration of larger particles into wood cells and in particular into the cell wall is much hindered. There is on-going debate in the scientific community whether wood treated with particulate copper systems has sufficient concentrations of copper in the cell wall to prevent degradation by soft rot fungi [4-6].

Whereas the macroscopic penetration in permeable wood species like the North American Southern Pine seem to be sufficient, experiences with less permeable (i.e. harder to treat) wood species like Nordic pine (*Pinus sylvestris*) – the dominant wood species in Europe – are limited. First results with particulate copper systems used commercially in North America indicate significantly worse penetration compared to currently used copper amine systems (Figure 2) on Scots pine sapwood.

![Comparison of copper penetration into Scots pine sapwood for two commercial systems based on particulate copper (left) vs. soluble copper amine (right). The blue colour indicates copper penetration using a Chromazurol indicator.](image)

One way to overcome penetration problems into important European wood species could be to reduce the size of the copper particles. However, this may have unwanted negative impact
on leaching (smaller particles are again easier to leach) and may also lead to critical discussions on the possible adverse effects of nanoparticles [7].

Also the question has been raised if the insoluble copper is sufficiently active. It needs to be bio-available to be metabolised by the wood decay fungi (or insects) to be effective. Though this questions are not yet fully answered, results from laboratory tests indicate that the level of bio-available (soluble) copper components are sufficient at least in freshly treated wood (cf. [8] and references therein).

Another challenge is to develop an economical, controllable and reproducible way to produce sub-micron particles. The most commonly used milling process is both time and energy consuming and seems not to be the optimum approach.

From today’s perspective micronized copper systems seem to offer a promising approach to overcome and improve some of the weaknesses of current copper amine systems. However, more research and long term experiences are needed to prove and improve usability of these systems for the European wood preservation industry.

Metal Free Systems

In the past metal free systems were traditionally based on organic solvents (mineral spirit) and used in lower hazard applications where dimensional stability is a concern (such as joinery, windows). However, with increasing awareness and legislation on emission of volatile organic compounds (VOC) these are more and more replaced by water-based systems. Insoluble organic biocides are combined with small amounts of solvents and emulsifiers to form water miscible micro emulsions or micro dispersions.

There is a large variety of actives and formulations available today. In general, they claim the following properties and possible advantages: non-metallic, low corrosion, low environmental impact, highly effective at low retentions, lighter / more “natural” colour of the treated wood, easier to stain afterwards. The most common fungicides used in water based metal free products today are Propiconazole, Tebuconazole, IPBC, Quats, DCOIT and Fenpropimorph (alone or in combination), often combined with insecticides/termiticides like Permethrin, Cypermethrin, Imidacloprid, Fenoxycarb or Flufenoxuron. Borax or boric acid may be additional actives. Most of these actives were used and/or originally developed for plant protection. All of the mentioned actives (except Imidacloprid) will be supported under the BPD and therefore are likely to be available for wood preservative formulations in Europe also in the future.

The efficacy of some of these actives or combinations in lab and field tests is quite good, some even show some efficacy in ground contact situations at reasonable retentions, and in fact also the track record of these systems in practise is usually good. They are the dominating wood preservative systems for treated timber under roof (European Use Classes 1 and 2) and become increasingly more important in situations exposed to weathering. Especially in above ground situations (UC 3) they can be more cost effective than copper amine systems. There are situations where the lighter colour is certainly an advantage, e.g. if combined with a light or clear coating. However, today the use in severe UC 3 applications without coating is still rare.

There are a number of reasons for that. It is known that despite their low solubility in water, most of these actives do not react with molecules in the wood cell walls (i.e. do not “fix”) and show higher leaching rates than copper salts. Also organic compounds are generally prone to UV degradation at the wood surface and also many are known to be degraded by
microorganisms, especially by bacteria. For developing and approving an active for plant protection, fast biodegradation of the active in soil contact is even a desired property. Also the BPD requires that an active is not persistent or accumulating in the environment. Persistent organic molecules like PCP are today largely restricted or banned as wood preservatives for that reason. However, this positive effect of biodegradability is obviously unwanted if it already occurs in treated wood in service.

Also modern organic biocides generally possess a more narrow spectrum of activity. This is also a desired effect, because this means that “non-target organisms” like mammals, birds etc. are not harmed. On the other hand these actives may not cover the full range of activity. So some of them are not sufficiently active against surface inhabiting organisms like mould fungi, stains, algae or moss, especially when the wood surface has been exposed to weathering and some of the organic biocides at the outer wood surface has been leached or degraded by UV. Also copper in treated wood acts as a UV stabiliser and wood without copper shows higher degradation by UV and weathering of the wood itself. In order to protect both the wood and the wood preservative from these effects of UV and water, wood treated with metal free preservatives is mostly coated or stained afterwards. Another option is a one step treatment with a metal free preservative containing a stain and/or a water repellent additive.

It is known from other areas like plant protection, health care or disinfection that microorganisms like fungi or bacteria can develop a resistance against certain biocides or modes of action. So far this problem is not known for copper containing wood preservatives but needs to be considered with the extended use of purely organic systems.

Another problem is that the wood is not stained by the (usually colourless) preservative and therefore the treatment is almost invisible after drying. Therefore it may be hard to distinguish treated from untreated wood and impossible to judge the quality of treatment without chemical analysis. Therefore, control stains may be added to the treatment solution.

The biggest challenge for metal free preservatives is to protect wood in ground contact. It seems unlikely that this may be achieved with one single active that is still environmentally and toxicologically acceptable and it is likely that this system may be significantly more expensive than current copper amine systems.

Therefore it seems likely that metal free systems will find increasing use in above ground applications, combined with additives and using new formulation technologies, but a competitive metal free product for ground contact may remain a dream for some time.

**Non-Biocidal Systems**

In the last couple of years there has been renewed interest in non-biocidal technologies to improve the properties of wood, commonly referred to as “wood modification”. Some of these technologies are already on the market today, such as various forms of thermally treated wood (Thermowood™ - FIN, PlatoWood™ - NL, Thermoholz™ - A, Retitech™ - FRA etc.), acetylated (Accoya™/Titanwood™ - NL), furfurylated (Kebony™ and Visorwood™ - NOR), resin modified (Belmadur™ - GER) and several more. For a good overview, cf. proceedings of the 1st – 3rd European Conference on Wood Modification [9-11]. Due to big differences between these technologies is it difficult to generalize here, but there are some trends.

Though it may not be the main target, some of these technologies also improve the durability of the modified wood against biological degradation considerably [11]. Several authors report that resistance against wood destroying fungi can be similar to natural durable wood species and preservative treated wood. However, most of these conclusions are based on short term
laboratory test and there is little long term field test data or practical experience available at this time with the long term performance of modified wood in high hazard situations. Also the total cost of the modified wood is prohibitively high in most volume applications.

Some of the perceived environmental advantages of modified wood towards wood components from soft wood treated with modern wood preservatives do not stand after thorough analysis taking into account the full life cycle of the wood component from production of the raw materials to disposal of the modified/treated wood. Some reasons are:

- Extensive use of energy in production of the modification agents and/or the modified wood.
- Usually far higher loadings of chemicals compared to modern wood preservatives.
- Emissions of volatile treatment components or reaction products from the modified wood.
- Fewer production centres for the treated wood mean higher transportation costs for both the untreated wood raw material and the treated/modified wood.
- Lower yields (e.g. split and hard wood free raw material) (= waste) and/or need to use specific wood species (possibly non-local).
- Possible advantages in reuse or disposal cannot be realised in practise due to logistic problems or prohibitive costs in sorting at the end of the life cycle.
- Higher overall costs.

After years of intensive research and also up to 10 years of experience in the market it seems that so far none of the modification technologies available today can offer a competitive solution for most classical applications of chemically treated wood. However, despite some shortcomings and remaining open questions, wood modification technologies in general can offer a new choice to improve wood. In certain applications modified wood is likely to offer a cost effective and more ecological alternative to tropical hardwoods or other materials from non-renewable sources such a plastic, steel/aluminium, concrete or wood plastic composites (WPC).

All different technologies have their specific advantages which makes them a versatile option for such applications where the cost of the raw material is not the decisive factor and where other criteria like dimensional stability, hardness, certain aesthetics etc. may be more important than just durability against biological degradation, namely joinery, (internal) flooring, garden furniture and to some extend cladding and decking.

Therefore they should be viewed more as an addition rather than a replacement for biocidal wood preservatives. An interesting approach would be a combination of a biocidal treatment together with a modification process in order to add the advantages of both approaches while minimizing their weaknesses.

**Quality**

Maybe the single most important feature that will govern, whether “durable wood” will gain or lose market share, is quality. Today, there are two opposing trends in the wood treatment industry. In some markets, existing quality standards for treated wood are lowered or weakened. For example the retentions for products recently approved in the US building codes seem to be rather low, without much “safety margin” compared to the standard
products approved earlier. Also there seems to be a lack of long term experiences with many of the products on the market today.

Also in the UK, there was a loss in transparency in recent years. This led to a loss in treatment quality, were three factors played together:

a) The (recommended) retentions of the new products were not clear but seemed low compared to the traditional products. Also the quality is somewhat harder to judge with products containing (colourless) organic biocides instead of (coloured) metals.

b) The treatment cycle parameters were “optimised” to such an extend that the previous safety margins were eliminated.

c) The wood quality changed from kiln-dried (imported) pine to wet pine or spruce.

These combined changes in wood treatment have led to a significant loss in treatment quality and consequently there are already the first reports of premature failures in some applications.

Also with some the new modification technologies there appears to be a tendency to lower costs by lowering the treatment standards. Since most of these treatments are not homologated by independent technical experts and the wood is not always third party surveyed, there is room for less than optimal products. The promoters of modified wood seem to have identified this thread and there are some first attempts to set common (minimum) standards also for modified timbers, like the new draft EN standard for Thermally Modified Wood, CEN/TS 15679:2007.

On the other hand there are some markets with high and even increasing requirements on the quality of treated wood or at least on some aspects, like the Nordic Countries, France and to some extend Germany.

The future is easy to predict here, looking at the past: markets with low or too low quality standards (and prices) will be lost for treated wood in the long term. There will always be a cheaper material or supplier and eventually the consumer will loose the confidence in the “unreliable” wooden material. On the other hand the success of the Nordic wood treatment industry, setting and keeping high quality standards and still growing the market shows how treated wood can be successful also in the future.

Summary and Outlook

There are a number of promising emerging technologies in wood preservation and protection. Change will be driven by regulatory and economic forces. We have reviewed a number of these new technologies, such as copper amine, particulate copper, metal free and wood modification technologies. We have identified chances and challenges for them. All of these technologies have their benefits and will help to make wood stay the preferred building material in the future. However, none of these technologies will be able to meet all the demands in the future and we will see a continuing segmentation and specialisation in the future. This will make things somewhat more complicated but there are also plenty of opportunities for durable wood to not only keep market share but also to gain from other building materials.

The major problem is that the very same regulations that are drivers for a technology change are also hindering innovation by introducing extremely high hurdles, risks and costs for innovation. Therefore the development of new innovative actives and technologies for wood preservation becomes an incalculable risk for the relatively small wood preservation industry.
A number of key findings on where we are heading in the next decade can be summarized as follows:

- Copper amine based systems are today the dominating wood preservative for industrial applications.
- Current and improved copper amine based systems will remain dominant for at least the next ten years.
- Particulate copper systems may gain acceptance if the existing problems with penetration into European wood species can be resolved.
- Water-based metal free systems will gain importance in lower hazard applications (up to use class 3) in the next decade, provided the aesthetic problems can be resolved.
- There will be few to no new actives introduced to wood preservation in the next years due to the high regulatory hurdles. The key will be clever combination and formulation technology.
- In timber treatment plants further risk mitigation measures will be installed to reduce emissions to an acceptable and save level.
- Wood modification will gain importance mainly in high-value applications where cost of treatment is not so critical and were further improvements of wood properties apart from durability (such as hardness or dimensional stability) are important.
- The market will split in a quality segment, with strict QC requirements, possibly with additives to offer an added-value and a low quality (commodity) segment. Eventually the latter may be lost for wood and/or European treaters.

As a consequence of the new European Legislation the European market for wood preservatives changed massively. The BPD is the key driver for this change but other regulations are of importance as well and together they pose huge challenges for the industry. On the other hand this change should also be seen as a chance to raise the advantages of a modern wood treatment. The benefits of wood as a unique and sustainable construction material are supported by a treatment with modern wood preservatives. In future we will have a system with European wide approved preservatives which will further improve the free circulation of goods in Europe. Timber treated with a BPD conform preservative is approved to be safe concerning health and the environment. Which competing construction material is able to provide this evidence on the same high level?

**Note:** Part of this paper has been previously presented at the Nordic Wood Preservation Meeting 2008.

**References**


List of European Laws


EPRTR, Regulation of the European Parliament and of the Council concerning the establishment of European Pollutant Release and Transfer Register, (2006/166/EC)
