Alternatives report:

Creosote versus other wood preservatives and non-chemical alternatives

Evaluating Competent Authority: Poland

Office for Registration of Medical Products, Medical Devices and Biocidal Products
181c Jerozolimskie Str., 02-222 Warsaw, Poland
Phone +48 22 492 1100
Fax +48 22 492 11 09
Email: pb@urpl.gov.pl

Poland is reference Member State for a national authorization of biocidal product family [redacted] which contains creosote (CAS: 8001-58-9) as the active substance.

Product Type	8 Wood preservatives
Where relevant, an exact description of the authorised use	Preventative
Target organism (including, where relevant) development stage)	• Wood rotting fungi (wood rotting basidiomycetes, soft rot micro-fungi, wood disfiguring fungi) • Wood rot in soil and water contact • Insects (termites, wood-decaying beetles)
Field(s) of use	Outdoor use • use class 3 • use class 4a • use class 4b
Application method(s)	1) Vacuum-pressure impregnation. 2) Hot-and-cold open tank (bath) method 3) Brush treatment of wooden constructions.
Category(ies) of users	Professional and industrial

Creosote is classified as carcinogenic, Carc. 1B; H350, and contains constituents that are regarded as PBT. The substance fulfils the criteria for substitution as outlined in Article 10 of the Biocidal Products Regulation No 528/2012 (BPR).

According to point 15 of Commission Directive 2011/71/EU of 26 July 2011 amending Directive 98/8/EC of the European Parliament and of the Council to include creosote as an active substance in Annex I, biocidal products containing creosote may be authorised only for applications where all local and other circumstances have been taken into account and no appropriate alternatives were found. It is also in line with article 23 of BPR. Presented document is created to address this issues.

Based on information which was accessible for PL CA at the time of assessment of documentation for product family [redacted]

[redacted] wood preservative products with a claim to be used within use class 3 and 4 available in Poland contain the following active substances:

1. Cooper salts (mainly carbonates);
2. Copper-Diazenium;
3. Coper hydroxide, cooper dihydroxide;
4. Coper oxide, cooper dioxide;
5. Boric acid;
6. Boron salts (mainly sodium);
7. Tebuconazole;
8. Propiconazole;
9. Cyproconazole;
10. IPBC;
11. Poly(oxy-1,2-ethanediyl),.alpha.-[2-(didecylmethylammonio)ethyl]-.omega.-hydroxy-, propanoate;
12. Quaternary ammonium mixtures.

The applicant was asked for providing analysis on the technical and economic feasibility of substitution of product family [redacted]. The applicant has submitted an analysis of existing alternatives concerning application of product family with creosote for sleepers and poles for transmission of electric power and telecommunications and the within the agricultural sector.

Additionally, The Office for Registration of Medicinal Products, Medical Devices and Biocidal Products has sent the letter to 15 Polish entities (ministries, research units, companies using creosote in its field of activity) with request for opinion on existing alternatives, also non-chemical, for product with creosote.

Polish Chamber of Chemical Industry has submitted information that currently there are conducted studies on the use of a mixture of creosote with linseed oil. According to document *Plant oils as "green" substances for wood protection* Nasko Terziev, Dmitri Panov, application of this mixture could decrease the amount of creosote needed for hazard class 3 and 4 to 30% compared to the pure creosote retentions approved today. This might be the only alternative for creosote products but it is not yet available for a commercial use.

According to other responses, products for preservation of a wood which are available in Poland do not provide sufficient efficacy for long term service life of sleepers or poles.

Therefore, taking into account current situation on Polish market of wood preservation, it can be concluded that products containing creosote are needed to be used.

In relation to agricultural use of product with creosote, the applicant has submitted several information from end-users. According to this information the use of creosote treated stakes in arboriculture is highly required. There are no sufficient alternatives for production of fruits which is very important part of Polish economy e.g. copper products are not economically feasible in comparison to creosote ones. Another important and common field of use of creosote are treated stakes for anti-hail curtains and plastic roofs (coatings). This type of use has also an impact on decreasing the need of use of some pesticides – fruits protected by curtains are also not being frequently wet (by atmospheric conditions) and this also results in restriction of growth of moulds on fruits.

Non-chemical alternative

Non-chemical alternative is mainly focused on a use of plastic, concrete or steel elements in concerned areas. Unfortunately, it is connected with some limitations. While concrete sleepers are used in rail track across most of the EU, wood sleepers are still essential for some parts of lines like crossovers and points where a flexible sleeper is required to be cut to special sizes when necessary. Some of the less frequently used tracks are also carried on wood sleepers. Replacement of wooden sleepers with steel or concrete is recognized as impossible for some applications i.e. power lines located in difficult terrain (forest or mountain). This application presents an alternative, however it is associated with high losses, including environmental.

In some publications where Life Cycle Analysis was carried out, it was shown that in a broader perspective when more environmental aspects are taken into account (e.g. climate, acidification etc.), the alternative materials may not be advisable choice when compared to the wood treated by creosote.

In the report *LCA of railway sleepers – Comparison of railway sleepers made from concrete, steel, beech wood and oak wood* (Frank Werner, Umwelt & Entwicklung, 2008) life cycle assessment (LCA) and comparison of the environmental impacts of railway sleepers made of concrete, steel, beech wood and oak wood was presented. The environmental effects assessment included influence on terrestrial, freshwater and marine ecotoxicity, human toxicity, formation of photochemical smog, stratospheric ozone depletion, acidification, depletion of abiotic resources and climate changes. During the assessment all production steps of the main materials and mounting equipment, over the use phase

up to its deconstruction, recycling and final disposal were taken into account. It was concluded, that wooden sleepers treated with creosote had the lowest impact on the environment.

The authors of document *Comparison of environmental impacts from utility poles of different materials – a life cycle analysis* (Martin Erlandsson, Swedish Environmental Institute (IVL), 2011) presented the comparison of the impacts of wooden poles treated with creosote, concrete poles, steel poles and composite poles (polyester-reinforced fiberglass with a polyethylene coating) on climate change, eutrophication, acidification, ground level ozone, ecotoxicity and human health. According to this paper composite poles have generally similar environmental performance, lower impact on eutrophication and they have greater impact on climate changes in comparison to concrete poles. Creosote poles and concrete poles do not differ so much. Concrete poles contribute more to climate changes and eutrophication, while creosote treated wood has a higher impact on photochemical ozone formation, human and ecological toxicity. Steel poles have higher ecotoxicity impact than creosote poles.

Conclusions

Both chemical and non-chemical alternatives for the applications of product family [redacted], do exist on a Polish market. However, there are no fully feasible and possible to apply methods replacing creosote-treated wood in relation to applications presented in this report which would have positive impact on socio-economical aspects in comparison with currently used of creosote products/creosote protected wood. Most of potential substitutes of creosote-protected wood are not widely used, are at the R&D stage or are used for the short period of time. In some cases, long term experience is needed to decide finally if the alternative is sufficient enough to replace creosote-treated wood. Currently, at the time of decision on the authorisation of [redacted] product in Poland this information is not available.

Taking into consideration information and analyses submitted by the applicant and received as a result of public consultations initiated by the Office for Registration of Medicinal Products, Medical Devices and Biocidal Products it can be concluded that for several uses there are no sufficient alternatives for creosote product in Poland. These uses relates to:

1) impregnation of wooden sleepers and poles;

2) impregnation in an agricultural sector e.g. fruit tree and hop/vineyard stakes, fences, anti-hail curtains.

Applicant has also requested for authorization of [redacted] for impregnation of noise barrier and for use in marine installations. Despite above it should be stressed that there was no sufficient information submitted to prove that there are no alternatives for creosote product for impregnation of noise barrier and for use in marine installations. Therefore these uses can not be authorized in Poland.

List of the opinions/documents submitted by the applicant:

1. Conclusions and Summary Report on an Environmental Life Cycle Assessment of ACQ-Treated Lumber Decking with Comparisons to Wood Plastic Composite Decking, Treated Wood Council, AqeAeTer, Inc., 2012
2. Conclusions and Summary Report on an Environmental Life Cycle Assessment of Borate-Treated Lumber Structural Framing with Comparisons to Galvanized Steel Framing, Treated Wood Council, AqeAeTer, Inc., 2012
3. Life Cycle Assessment Procedures and Findings for Creosote-Treated Railroad Ties, AqeAeTer, Inc., 2013
4. Conclusions and Summary Report Environmental Life Cycle Assessment of Highway Guard Rail Posts, AqeAeTer, Inc., 2013
5. Conclusions and Summary Report Environmental Life Cycle Assessment of Marine Pilings, Treated Wood Council, AqeAeTer, Inc., 2012
6. Life cycle assessment (LCA) of railway sleepers. Comparison of railway sleepers made from concrete, steel, beech wood and oak wood, Werner F., 2009
7. SUWOS Sustainable Wooden Railways Sleepers, International Union of Railways (UIC), 2013
8. Inventory and emission factors of creosote, Polycyclic Aromatic hydrocarbons (PAH), and Phenols from Railroad Ties Treated with Creosote, Kohler et. al, 2000
9. Emission of PAH from creosoted railroad ties, Kohler-Kuenniger, 2003
10. Background data and assumptions made for an LCA on creosote poles, Erlandsson M., Almemark M., 2009
11. Technical feasibility of substitution of creosote for the treatment of wood for poles, sleepers, fencing, agricultural uses (including tree stakes), fresh and sea water uses

and professional use in the context of application for authorisation of creosote in accordance with the Biocidal Products Directive, Coggins C.R., 2013

12. Socio Economic Case for the Continued Use of Creosote as a Wood Preservative for Wood Poles V1.4, Borrie D., 2013
13. Opinion of The PKP Linia Hutnicza Szerokotorowa Sp. z o.o.
14. Answer for questionnaire about the use of creosote-treated sleepers, The Kopalnia Piasku Kotlarnia – Linie Kolejowe Sp. z o.o.
15. Answer for questionnaire about the use of creosote-treated sleepers, The PKP Polskie Linie Kolejowe S.A.
16. Answer for questionnaire about the use of creosote-treated sleepers, The PKP Szybka Kolej Miejska w Trójmieście Sp. z o.o.
17. Answer for questionnaire about the use of creosote-treated sleepers, The PKP Linie Kolejowe Sp. z o.o.
18. Opinions of The Nasycalnia Podkładów Sp. z o.o. Pludry.
19. Opinions of The Nasycalnia Podkładów S.A. Koźmin Wlkp.
20. Opinion of The Nasycalnia Podkładów w Czeremsze Sp. z o.o.
21. Opinions of The Track Tec Lipa Sp. z o.o.
22. Answer for questionnaire about the use of creosote-treated poles, The ENEA Operator Sp. z o.o.
23. Opinion of The ENERGA Operator Sp. z o.o.
24. Opinion of The PGE Dystrybucja S.A.
25. Opinion of The TAURON Dystrybucja S.A. Będzin.
26. Opinion of The TAURON Dystrybucja S.A. Wałbrzych.
27. Opinion of The Instytut Kolejnictwa.
28. Opinion of The Ministerstwo Gospodarki.
29. Impregnation of wooden sleepers with regard to the physicochemical properties of the used products, Jaworska A., Milczarek D., Naduk E., 2012.
30. Technical and economic analysis the possibility of replacing creosote in Poland for the year 2014, Centrala Obrotu Towarami Masowymi DAW-BYTOM Sp. z o.o.
31. Orchard scaffolding on wooden piles, The Doradca Sadowniczy, 2013.
32. Constructions for apple and pear trees, The Informator Sadowniczy, 2012.
33. Answer for questionnaire about the use of creosote in agriculture sector, The Gospodartstwo Sadownicze – Mazur W.

34. Answer for questionnaire about the use of creosote in agriculture sector, The Gospodartstwo Sadownicze – Grzejszczyk B.
35. Opinion of The Drewgór S.Walczak i S-ka, Spółka Jawna.
36. BPR – creosote authorisation – comparative assessment, European Institute of wood preservation.

List of the opinions/documents submitted as a result of public consultations initiated by the Office for Registration of Medicinal Products, Medical Devices and Biocidal Products:

1. Opinion of The CTL Logistic.
2. Opinion of The Instytut Chemicznej Przeróbki Węgla.
3. Opinion of The Infra Silesia.
4. Opinion of The Jastrzebska Spółka Kolejowa Sp. z o. o.
5. Opinion of Opinion of The PKP Linia Hutnicza Szerokotorowa Sp. z o. o.
6. Opinion of The Ministerstwo Infrastruktury i Rozwoju.
7. Opinion of The TAURON Polska Energia.
8. Opinion of The TAURON Wytwarzanie.
9. Opinion of The Polska Izba Przemysłu Chemicznego.
10. Plant oils as “green” substances for wood protection, ,Nasko Terziev, Dmitri Panov.
11. Non-Arsenical Wood Protection: Alternatives for CCA, Creosote, and Pentachlorophenol, Freeman M.H.