**General comments and answers to specific information requests**

**Specific information requests:**

**Use as high temperature Heat Transfer Fluid (HTF)**

1. Any robust, representative data on the Operational Conditions and Risk Management Measures that are in place in heat transfer systems where terphenyl, hydrogenated is used?
2. The Dossier Submitter states that Directive 2014/68/EU - the Pressure Equipment Directive (PED) - would apply to heat transfer systems containing terphenyl hydrogenated and that as such this already sets requirements to these installation in terms of safety. What robust representative evidence is there that these OC and RMM are appropriate and effective in containing the substance and avoiding emissions?
3. The Dossier Submitter states that (Section E.3.4 of the Annexes to the terphenyl, hydrogenated Restriction report) that the following measures must be in place to contain the substance: general leakage collection systems, containment devices installed beneath flanges and pumps, retention systems in pumps and valves to ensure that any leakage of terphenyl, hydrogenated through the seals is safely drained off and collected in a contained space, terphenyl, hydrogenated level monitoring. Do you have robust representative data on the extent that these measures in place throughout the sector? What are the costs of installing and operating these OCs and RMMs if not already available?
4. The top-up or refill demand in heat transfer systems is driven by the degradation rate of the HTF and the separated low-boiling and high boiling degradation products. Do you have any information on releases of these degradation products and on the presence of o-terphenyl in the degradation products? How are releases to the environment avoided when e.g. fluids are replaced or topped-up, when accidental spills occur or when installations are decommissioned at the end of service life. Do you have robust, representative information on the likelihood and severity of accidental releases of terphenyl, hydrogenated including accidental spills, disposals, decommissioned installations? Do you have any robust representative data on how wastes are managed in heat transfer systems?
5. The Dossier Submitter has identified (Section E.A.1 of the Annexes to the terphenyl, hydrogenated Restriction report) that the heat transfer systems play a role in the further development of renewable energy sources (in e.g. solar panels) and that as such the use of terphenyl-h in these applications is assumed to grow. What is the expected Compound Annual Growth Rate for HTF? Would a restriction on terphenyl-hydrogenated be an impediment to the further development of renewable energy sources?
6. Considering the use of terphenyl, hydrogenated, as a heat transfer fluid, the Dossier Submitter discards some alternatives based on boiling point. However, the boiling point depends on the type of process in which the HTF fluid is used. Could other alternatives for HTF like biphenyl, (hybrid organic) silicones or mineral oil be used for some processes (for example Concentrated Solar Panels (CSP) or Organic Rankine Cycle (ORC) or some chemical plant)? Could you provide justification, to support a derogation or why alternatives to terphenyl, hydrogenated are not suitable? We would particularly welcome information on any specific technical criteria relevant to specific uses that could not be fulfilled by alternatives.

**Other uses**

1. Any robust, representative information on uses of terphenyl, hydrogenated as a plasticiser in coatings, sealants, adhesives, polymers, cables and inks? Although the above uses have been identified by the Dossier Submitter, very limited information is reported. Is terphenyl, hydrogenated used in processes and articles other than those mentioned in the restriction proposal? What is the function of terphenyl, hydrogenated in articles, in what type of articles is it applied and at what is the concentration of terphenyl, hydrogenated in the articles that is needed in order to achieve this function? How are the markets for the articles including terphenyl, hydrogenated? Is there competition from alternatives? Which markets are expected to grow, and which are not?
2. Any further robust representative information on specific uses of terphenyl, hydrogenated in the aerospace applications to justify the proposed derogation by the Dossier Submitter? Relevant information for these uses (i.e. articles and aerospace applications) could include, amounts currently used, site-specific emission data (associated with manufacture, service-life or end-of-life (management at waste stage)), and any impacts (costs and benefits to society) of the proposed restriction on these uses (in line with the elements of a socio-economic analysis (SEA) as outlined Annex XVI of REACH.
3. Information on analytical method(s): which analytical methods are available to quantify terphenyl, hydrogenated (or its constituents such as o-terphenyl) in substances, mixtures and articles (apart from NIOSH 5021 “o-Terphenyl”) and what is the applicability of these analytical methods at EU level?
4. Any further information on actual concentration of Terphenyl, hydrogenated in recycled materials (or as impurity in substances and mixtures) and information on how the proposed restriction could potentially affect the concentration of terphenyl hydrogenated in recycling (especially of plastic materials)
5. As terphenyl, hydrogenated and biphenyl are produced together in the same process as coproducts, if terphenyl, hydrogenated would be banned, how would it affect to the biphenyl final cost? In case of maintaining biphenyl production how would terphenyl, hydrogenated be disposed of?
6. In which other substances, mixtures and articles is ortho-terphenyl present? What are the associated uses? What would have been the consequences of this restriction, in terms of avoided emissions and compliance, if the scope would have been on ortho-terphenyl instead of terphenyl, hydrogenated?

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| Ref. | Date/Type/Org. | Comments |
| 3589 | Date:  2022/07/19 16:29  Content:  Scope or restriction option analysis  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  Eastman Chemical  Org. country:  Netherlands  Attachment: | General Comments:  See attachment |
| Answer to specific info request 1:  See attachment |
| Answer to specific info request 2:  See attachment |
| Answer to specific info request 3:  See attachment |
| Answer to specific info request 4:  See attachment |
| Answer to specific info request 5:  See attachment |
| Answer to specific info request 6:  See attachment |
| Answer to specific info request 9:  See attachment |
| Answer to specific info request 11:  See attachment |
| Answer to specific info request 12:  See attachment |
| Dossier submitter response:  A reply to these comments was given in the sections on “Use as Heat Transfer Fluid” and “Miscellaneous” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” and “Miscellaneous” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” and “Miscellaneous” of the general response to comments. |

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| 3591 | Date:  2022/07/20 14:47  Content:  Hazard or exposure  Environmental emissions  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Netherlands  Company name confidential:  Yes  Attachment:  <redacted>  Privacy statement:  The provided information is specific for our production location. hence it is not appropriate if this type of information is shared with other users of terphenyl, hydrogenated. | Answer to specific info request 1:  See attached (confidential) document |
| Answer to specific info request 2:  See attached (confidential) document |
| Answer to specific info request 3:  See attached (confidential) document |
| Answer to specific info request 4:  See attached (confidential) document |
| Answer to specific info request 5:  See attached (confidential) document |
| Answer to specific info request 6:  See attached (confidential) document |
| Answer to specific info request 9:  See attached (confidential) document |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3637 | Date:  2022/10/13 10:02  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  Borealis AG  Org. country:  Austria | General Comments:  Borealis is using hydrogenated, terphenyl (PHT) as heat transfer fluid (HTF) in our cumene and phenol plants at a petrochemical site in Finland. Borealis supports the proposal to derogate HTF use from the PHT restriction. We use PHT in closed systems and emissions and leakages are under strict control. A ban of PHT for HTF use would mean we would need to shut down our plants which would cause loss of business and employment. |
| Answer to specific info request 1:  • The substance is handled in closed system in a closed industrial area. Training is required to enter the area. • A systematic training program is installed for all employees at the plant. • The hot oil heater system is a closed system and subject to the preventive maintenance and inspection program. • The Emergency Shutdown system is securing safe operation of the system. • There are written procedures for operation and maintenance in place. |
| Answer to specific info request 2:  • When handling the terphenyl, hydrogenated (PHT), “SEVESO III Directive 2012/18/EU” and other national laws, standards and regulations are applied • All the equipment has been designed and built by the national laws, standards and regulations, which are based on the “Pressure Equipment Directive 2014/68/EU” mentioned above. • A work permit system is in place that demands a risk assessment and is defining PPE’s • Minimum personal protective equipment (PPE) requirement in our cumene/phenol plant is composed of a chemical resistant overall, chemical gloves, safety goggles, high angle boots, helmet and ear protection. • There are various gas masks and respiration equipment available on site if required. • Emission samples have been taken when filling up the heat transfer system after maintenance. No emissions of PHT were found in the analysed samples. |
| Answer to specific info request 3:  • There is a controlled decommissioning of equipment for maintenance including steam out cleaning and collecting/treating condensates. • Continuous monitoring and control by the online distributed control system gives alarms in case of deviations. • In case of leakage of the substance, it is collected in an oily water storage tank for pre-treatment prior to sending to the wastewater treatment plant. • Sampling of oily water on a regular basis is done which would reveal any HTF leakages. • Safety measures are in place already due to other hazardous chemicals handled in the plant, thus not possible to estimate cost share for the PHT. |
| Answer to specific info request 4:  • The hot oil heater system is a closed system and subject to the preventive maintenance and inspection program. • All equipment is designed for the use of PHT in the heat transfer system. • Operators are inspecting the plant several times per day and alert if they see a leakage. Maintenance activities will start with high priority. • The plant is built on a concrete basin that is drained to an oily water sewer system, thereby preventing potential spills from entering the environment. Typically, we find small leakages (e.g. dripping from flanges) once or twice a year which are easy to fix by tightening the flange. Isolation or shutting down the plant is typically not necessary. Since the floor of the plant is fully sealed, no PHT is entering the environment. Any dripping will be removed from the sealing/paving and disposed of accordingly as dangerous waste. The substance is slowly degrading under the circumstances it is used to smaller molecules. This light fraction is collected and cooled down. The vapour phase is burned on site in a vent gas incinerator, the liquid phase is sent for further treatment to a certified hazardous waste treatment plant, where it is incinerated due to the high calorific value. |
| Answer to specific info request 6:  The heat transfer system of our plant has been specially designed for PHT as heat transfer fluid. There is no alternative available that would not either have the same PBT properties as PHT or require massive reconstruction of the plant. The latter is not economically feasible. The plant would rather be shut down leading to loss of business and workplaces. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3655 | Date:  2022/11/03 11:47  Content:  Scope or restriction option analysis  Environmental emissions  Baseline  Information on alternatives  Information on benefits  Other socio economic analysis (SEA) issues  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Industry or trade association  Org. name:  Aerospace and Defence Industries Association of Europe (ASD)  Org. country:  Belgium  Attachment: | General Comments:  Responses entered through section 4 as an attachment. |
| Answer to specific info request 7:  Responses entered through section 4 as an attachment. |
| Answer to specific info request 8:  Responses entered through section 4 as an attachment. |
| Dossier submitter response:  A reply to these comments was given in the section on “Uses in Aviation and Defence” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Uses in Aviation and Defence” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Uses in Aviation and Defence” of the general response to comments. |

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| 3656 | Date:  2022/11/09 21:59  Content:  Scope or restriction option analysis  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Netherlands  Company name confidential:  Yes  Attachment:  <redacted>  Privacy statement:  Attached document contains actual plant data from a unit in one of the manufacturing sites. The intention was to provide real plant data to buttress points provided in the non-confidential information section. It would be appreciated if it is kept confidential as requested. | General Comments:  Comments provided in his public consultation lends support the restriction on the use of terphenyl hydrogenated (PHT) as a heat transfer fluid in manufacturing operations. The technical feasibility of using PHT under strictly controlled closed systems in our plants implies the risk of exposure to the environment is adequately mitigated during use. This makes restricting use of PHT implementable and manageable. |
| Answer to specific info request 1:  The terphenyl hydrogenated is used as heat transfer fluid in a fully closed system in manufacturing operations at the chemicals plant and refinery. The plant is operating as a TIER 1 plant which means every step is balanced in safety, efficiency and operating parameters. |
| Answer to specific info request 2:  Throughout the entire lifecycle PHT in our plant, the product is kept in a closed system. The PHT hot oil pumps are provided with a double barrier mechanical seal. If one of the barriers fails, the pump is taken out of service and repaired. Even with a failed seal, PHT leak to the environment is prevented as the second seal barrier is still in place. |
| Answer to specific info request 3:  PHT is handled under adequately restricted conditions onsite starting from the unloading step when receiving container of fresh material from supplier, the storage tank, the heating loop, the drain to remove decomposed material, through to handover to a certified waste handler. The PHT is received in 23 cubic metre containers from our supplier and unloaded with Nitrogen pressure into our storage containers without exposure to the environment. It is heated in our furnaces before it is used in our reboilers and heaters. Fresh material is normally supplied from the storage tank to fill up the heating loop. During the lifecycle of the product in the plant the product is kept in a rigorously closed system. There is a drain for decomposed material and the decomposed PHT waste is processed by a certified chemical waste handler. Strictly documented procedures are in place for unloading, maintenance, operations, and removal of decomposed substance. The whole unit where PHT is used is situated above leak tight floors. If there were to be a leak, such a leak will be captured on the thick concrete floor underneath. In summary • System is a closed loop and in circulation. PHT is collected in collection vessel. • Pumps are installed on base plate that can collect liquid from leakages. • PHT in circulation system is operated free from oxygen. • PHT is subject to weekly monitoring through sampling and lab analysis where e.g., Initial Boiling Point, flash point, acid content, viscosity and sulphur content are determined • Pumps in this system have double mechanical seals. • On all vessels and in the tank, level control, monitoring, alarming and instrumented protective system is active. • Entire system is subject to certified inspection programme as well as corrosion monitoring of the modelled corrosion loops. |
| Answer to specific info request 4:  The whole unit is located on a liquid tight floor. Any drop is considered as LOPC (Loss of Primary Containment) and action taken promptly. Such an incident, if it were to happen, would be reported in the site Incident Management System and acted upon. Waste PHT is disposed trough a certified waste handler. (Refer to Section 5 for graphical representation of PHT in the SDA unit) A Dopak closed sampler system for liquids is installed to take samples. In this system a needle sticks through the rubber cap of the bottle such that there is no contact of PHT with Operator or exposure environment (zero emission). |
| Answer to specific info request 7:  The substance is used as heat transfer fluid only in a fully closed loop in the plant, PHT and does not end up in articles. |
| Answer to specific info request 9:  Analysis of PHT (fresh or used) is not carried out onsite but by the PHT supplier. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3658 | Date:  2022/11/17 14:39  Content:  Scope or restriction option analysis  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Belgium  Company name confidential:  Yes | General Comments:  To meet their functionality requirements, all high-temperature non-pressurised HTFs must possess physical properties that make them long-lasting, capable of withstanding high temperatures, and very stable. Therefore, we believe that alternative heat transfer fluids are likely to raise similar concerns. Temperatures go up to 310 °C in our process and Therminol is used to heat key pieces of equipment and to cool high temperature reactors and condensers. It’s use is essential to avoid blocking up the system, which might cause safety issues in the production process. We haven’t looked for other products yet. Replacing the entire Therminol inventory with an alternative HTF would be costly and there are no perceived benefits in doing so. Besides the purchase cost of another possible HTF, incompatibility issues might create the need to clean the extensive piping system, with related disposal difficulties and costs. Or incompatibility with material of construction could mean that the system will need to be constructed with another compatible material, further increasing cost. The profitability of the process could be reduced and, in the worst case, this could mean that the only producer of 4-ADPA production in the West could cease production, causing direct employment loss of 100-200 people. This means our Chinese competitors will gain full control of the 4-ADPA market. Drain tank present. Use of correct materials of construction and inspection programs in place. Process hazard analysis are performed on the Therminol system to assess the risks of exposure/releases. Concrete floors and bunds with separate sewers are used as containment devices. Expansion tank has a nitrogen blanket. Yearly sampling to assess fluid quality Sealless pumps or pumps with double mechanical seals used. Inspection program in place. Control program potential leakages Level of expansion tank is monitored and alarms present.  Therminol 66 is also used as seal liquid for pumps at higher temperatures. For our seal liquids we also need thermal stability, but they also need to be (as) sulfur free (as possible) with the correct viscosity on higher temperatures. Alternatives will need to be sought with extensive testing of potential influence on catalytic reactivity and influence on seal and seals lifetime. If no alternatives are found alternative pumps will need to be installed. |
| Answer to specific info request 1:  Temperatures go up to 310 °C in our process and Therminol is used to heat key pieces of equipment and to cool high temperature reactors and condensers. It’s use is essential to avoid blocking up the system, which might cause safety issues in the production process. To avoid decomposition and increase lifetime, temperatures have been reduced. Interlocks in place to: -avoiding high temperatures or pressures on heater, heat exchangers, pumps and whole system which avoids damages to the HTF system. -avoid overfilling of the system which avoids direct spills -monitor level of drain tank and shut of HTF if level is too low which enables leaks to be detected. Containment and bunds present with drainage to contained space to avoid HTF to go to the environment. e.g.Concrete floors and bunds with separate sewers. Monitoring of HTF aging status by yearly check. Drain tank and filling station to remove old HTF or suck in new HTF in a controlled manner Nitrogen blanket present on expansion tank and sealless pumps or pumps with double mechanical seal used. |
| Answer to specific info request 2:  5-yearly PHA cycle in place which assesses environmental and safety risks and sets supplementary protection measures. Piping selection based on piping standard accounting for product properties and operating conditions. Pipe spec also includes periodic inspection. |
| Answer to specific info request 3:  Most of the measures in place. Not all flanges have containment devices as our burner is placed outside the process building and not for all flanges in long pipelines there is containment underneath but if there should be a leak this is easily noticed. Flanges are installed according to GMP and according to piping standard using suitable materials of construction. |
| Answer to specific info request 4:  Dedicated installation to drain and fill up HTF system. Concrete floors and bunds with separate sewers are used as containment devices. Old replaced HTF is managed through approved waste management companies who will try to reuse as much of the burning energy as possible. We also installed a filter which can filter out polymerised particles out of our circulation loop. This means the lifetime of the Therminol in our system will be prolonged and thus there will be less potential exposure and releases into the environment. |
| Answer to specific info request 6:  We need a thermally-stable molecule (up to 310°C) to be used as heat transfer fluid in our process. It is doubtful whether there will be an equivalent alternative without the concerns of being persistent and bio accumulative. The risks of changing to a possible alternative have not been evaluated and these may preclude its use. Replacing the entire Therminol inventory with an alternative HTF would be costly and there are no perceived benefits in doing so. Besides the purchase cost of another possible HTF, incompatibility issues might create the need to clean the extensive piping system, with related disposal difficulties and costs. Or incompatibility with material of construction could mean that the system will need to be constructed with another compatible material, further increasing cost. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3659 | Date:  2022/11/18 12:53  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Italy  Company name confidential:  Yes | General Comments:  PHT is used in our lubricant distillation plant in a closed pipe circuit. Temperature range for the product is 350-400 °C Whithin this range, other HTF are more unstable to oxidation and degradation phenomena. Environmental effect are limited to accidental splits of material, which are part of our risk management strategy due to the sensitivity of the issue. The emptying and refilling operation are conducted during the periodical maintenance stops, @ ambient temperature and pressure. |
| Answer to specific info request 1:  Every six months samples of PHT (reapresenting the state of the product during the usage) are sent to accredited labs, as part of an survey plan issued by our supplier. Data are stored in the supplier's database (which we have access to). |
| Answer to specific info request 2:  The purging (gas phase) of the expansion tank togheter with any other contribution form the higher parts of the of the PHT circuit, in compliance with the PED, is fed to a closed tank capped with Nitrogen and subsequently pumped to the energy recovery plant (WTE). |
| Answer to specific info request 3:  The company is certified against ISO 45001 standard. All the H&S critical activities are subject to periodical audit, the relevant personnel is trained and retrained against the risk connected with each work operation. Training is managed with accredited formers and documented. As mentioned in ITEM 1, the PHT aging status is monitored. As structural measures, all the flanges of the circuit are equipped with safety covers (specific for the high temperatures) Valves installed in the circuit are specifically designed for HT applications The distillation plant is equipped with an automatic fire detector and estinguishing system The whole plant is under video surveillance and the most critical parts are covered by thermal imaging cameras. Overall costs of incident prevention and heath and safety system can be esteemed to about 1% of the company turnover. |
| Answer to specific info request 4:  Gas phase is treated as described in ITEM 2 In case of degradation or any effect linked to the aging of the PHT, the liquid phase is sent to the energy recovery plant (WTE) Accidental spillage are not likely to occurr, based on the last 10 years of data from the H&S management system. |
| Answer to specific info request 6:  With reference to our application field, we are not aware of any alternative to HTF that can perform in the Pressure and Temperature process range. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3660 | Date:  2022/11/24 15:38  Content:  Scope or restriction option analysis  Hazard or exposure  Information on alternatives  Other socio economic analysis (SEA) issues  Type:  Individual  Country:  Italy | Answer to specific info request 1:  Based on SDS of the product, we follow the standard HSE practices. Terphenyl is used in a closed circuit under N2 atm. No emission are present under normal operating conditions. |
| Answer to specific info request 2:  Terphenyl is used only as heat transfer fluid in a closed circuit under N2 atm. The circuit is under standard process control systems (DCS system) avoiding hazardous and losses prevention. |
| Answer to specific info request 3:  Terphenyl is used only as heat transfer fluid in a closed circuit under N2 atm. The plant is equipped with leakages collection systems. |
| Answer to specific info request 4:  Degradiation is managed by venting to blowdown systems avoiding atmospheric emission. The topped-up is managed by direct loading to a collection tank avoiding atmospheric emission |
| Answer to specific info request 6:  other products alternatives to terphenyl needs to be evaluated accurately and its could have a great impact on the current plant design in terms of circuit materials, pumping systems, heat transfer equipments like furnaces, etc.. The systems have to be integrally reviewed and it will take time and great economic impact both for engineering study and realization of new projects. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3661 | Date:  2022/11/29 12:26  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  Pralafera Energia soc agr. R.L.  Org. country:  Italy | Answer to specific info request 1:  HTF is circulating in a closed system which present following items. Expansion tank closed and inerted in which all the system vent are collected always trough closed circuit- Pumps with mechanical seals push the HTF trough the circuit and are periodically (once a week) checked in terms of constant pressure; moreover once every two weeks seals are as well checked to control their status and avoid leakages. All the system is remoting controlled with a PLC that provide all the fluid parameters (Pressure, temperature and fluid level). Once year we provide HTF analysis to control the fluid status with fluid supplier. All the plant stuff are periodically checked by the relative producer. |
| Answer to specific info request 2:  PED regulation is the international and national rules that we have to take care for the HTF plant. This set out periodical inspection each 5 to 10 years for some part of the circuit plus security pressure valves check. So the totla amount of control set out by this legislation plus all the other control measure we put on the field for the HTF plant are enought to keep the htf controlled into the circuit. |
| Answer to specific info request 3:  All the HTF circuit is closed and uder controll. Each possible venting part from the HTF circuit are collected to the expansion vessel or to the principal security HTF vessel. Also from the expansion vessel drains are collected to the principal security vessel so there is not a free point of emission into the environment for the HTF. Refill or top up of new fluid is always provided by the principal security vessel. Eventual leakages of PHT from valves and pumps of the circuit are collected on an industrial pavimentation where all the perimeter is confined and ready to confine the leakage, so no htf could drain out from this industrial pavimentation. |
| Answer to specific info request 4:  As before mentioned all the drains of PHT are collected directly to the HTF tank in a closed circuit. Fill and top-up are directly pushed from the HTF tank. Disposal of degraded PHT are provided following national legislation. |
| Answer to specific info request 5:  We use PHT as HTF for a biomass power plant so a renewable resources. For us PHT as HTF is mandatory to provide the correct runningof our system. |
| Answer to specific info request 6:  No alternatives are present on the market today. We are using PHT as HTF at Operating temperature 305° in a liquid phase and is mandatory for the plant production. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3662 | Date:  2022/11/30 17:41  Content:  Scope or restriction option analysis  Information on alternatives  Information on benefits  Other socio economic analysis (SEA) issues  Transitional period  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  United Kingdom  Company name confidential:  Yes  Privacy statement:  N/A | General Comments:  PHT is used by our company as a substance ingredient in bought-in (1) catalysts for encapsulant resins on probe stems of meters used in medical, scientific & in industrial applications (the latter used to quantify magnetic fields at specific axis points); (2) in catalysts for adhesives in medical & aerospace magnetic applications; (3) in catalysts for adhesives in aerospace power supply applications; (4) in adhesives in circuit card assemblies in motor controllers used to convert AC to DC current to regulate power to fans used on aircraft; 5) as a varnish ingredient applied to the unit housing of Vibration Monitoring Units located on the airframe of an unmanned defence aircraft. For use applications 1 through 4, our manufacturing company is based in the US but exports final articles containing PHT to EU customers. The 5th use application relates to our manufacturing facility in Switzerland. For all use applications, no PHT-free viable/tried & tested catalysts/adhesives/encapsulants/varnishes have yet been identified for such applications. Parker Meggitt wishes for this consultation response to be considered in parallel to the ASD & AIA PHT consultation responses already submitted and Parker Meggitt fully support the content these sectoral submissions in particular any delayed extension regarding the entry into force of PHT restrictions applicable to aerospace applications. |
| Answer to specific info request 7:  PHT is used by our company as a substance ingredient in bought-in (1) catalysts for encapsulant resins (PHT@5-10% in mixture) on probe stems of meters used in medical, scientific & industrial applications (the latter used to quantify magnetic fields at specific axis points); (2) in catalysts (PHT@5-10% in mixture) for adhesives in medical & aerospace magnetic applications; (3) in catalysts for adhesives (PHT@10-30% in mixture) in aerospace power supply applications; (4) in adhesives (PHT@10-30% in mixture) in circuit card assemblies in motor controllers used to convert AC to DC current to regulate power to fans used on aircraft & (5) in varnishes (PHT@ 20-50%) applied to vibration monitoring unit housings for unmanned defence aircraft in extreme environments subject to heat, salt & sulphur dioxide. No PHT-free viable/tried & tested catalysts/adhesives/encapsulants have to date been identified for such applications. |
| Answer to specific info request 8:  For use applications 1 through 4, the main PHT key functionalities are flexibility toughness, curing time, impact resistance and adhesion whereas for use application #5, the PHT key functionality is to increase the flexibility and rub resistance on surface applications. With no suitable PHT-free solutions identified, our company would not be able to deliver a fit form and function unit and the unmanned defence aircraft could not be produced. In addition, other aerospace users would not be able to produce and deliver aircraft units that operate in extreme environmental conditions so any such restriction proposal affecting airframes or defence platforms should only be considered following necessary dialogue with the European Defence Agency (EDA) & the European Union Aviation Safety Agency (EASA) & other key stakeholders. |
| Dossier submitter response:  A reply to these comments was given in the section on “Uses in Aviation and Defence” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Uses in Aviation and Defence” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Uses in Aviation and Defence” of the general response to comments. |

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| 3663 | Date:  2022/12/02 09:13  Content:  Information on benefits  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Germany  Company name confidential:  Yes | General Comments:  HEat transfer systems are closed loops and only for industrial applications. The plants are closed systems and there is not contact to the Product. The stuffs are trained by company or heater manufacturer how to operate the plant and handle the fluid. |
| Answer to specific info request 1:  HEat transfer systems are closed loops and only for industrial applications. The plants are closed systems and there is not contact to the Product. The stuffs are trained by company or heater manufacturer how to operate the plant and handle the fluid. HEater nanufacture do annually saftey inspection of the system and HTF producer do one time per year a analyze of the HTF - so you are sure that you can operate the system on a safe way. |
| Answer to specific info request 2:  The directive belongs to the AD2000 Merkblatt and there is the link to the DIN 4754 - all european heater manufacturer follow this rules, how you have to built the system and how to operate it safe. Oil test, Satefy inspection of teh plant, Manuell from heater manufacturer show also that you have to make daily checks on the plant. |
| Answer to specific info request 3:  Most of the plants are using this. |
| Answer to specific info request 4:  The light boilers are boiled out by the operator or service company and collected in an approved container so that they do not get into the environment in an uncontrolled way. |
| Answer to specific info request 6:  The alternatives mentioned all have extreme disadvantages compared to the terphenyl. It can be operated at high temperatures virtually without pressure in the liquid phase. In the event of overheating, it forms at most a small amount of low boiling point, which can then be safely removed from the system. Mineral oil tends to form sludge and deposits in the heat exchanger during overheating. This is very damaging to the environment, as it has to be replaced and cleaned frequently and causes an increased CO2 exchange. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3664 | Date:  2022/12/02 13:11  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Italy  Company name confidential:  Yes | General Comments:  In this company we use TERMINOL 66 (or 68) DIATHERMIC OIL for one boiler, so we need to know if it will be possible to continue using it or if it's necessary searching, so founding, an alternative in the marketplace. |
| Answer to specific info request 1:  In any case the company implements all the mandatory H&S rules to reduce any kind of risk in operational condition. |
| Answer to specific info request 2:  The company is aligned with the Directive 2014/68/EU - the Pressure Equipment Directive (PED) |
| Answer to specific info request 3:  The company uses this product only in close circuits. In case of spill, always on paved ground, we follow also our internal procedure "Management of spills -liquid or chemical origin - use of spill kit"(if required also absorbent cloths are used for the containment of the spill) nd our Emergengy Intenal Plan. In case of dangerous sludge we don't drain into freshwater, but we send to a landfill. |
| Answer to specific info request 4:  We don't have detaild and written information because we rarely (i.e. one time/year) have to recharge. In these case we use always suitable pump in closed circuit and we follow severe procedure related to HSE matters. |
| Answer to specific info request 5:  We need to acquire more information about this matter even if we are sensible to energetic matters (energy sources and renewable sources). We need to reduce our energy consumption. |
| Answer to specific info request 6:  For our processes often we need to reach high temperature and we know that with diathermic oil we reach and maintain our target. At the moment we haven't identified on the marketplace alternative products with the same efficiency. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3665 | Date:  2022/12/05 16:50  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  Individual  Country:  Sweden | Answer to specific info request 1:  We measure flow and temperature in our hot oil system. The electrical heaters used to heat the hot oil are interlocked towards high temperature and will stop heating if the temperature gets too high. We also have level measurement in our expansion vessel which enables us to notice if the level changes over time. To decrease the aging of the hot oil we are using inert gas (nitrogen) in our expansion vessel. The expansion vessel is not open directly towards the atmosphere, but instead through a storage tank. The hot oil heaters and all pressurized vessels are inspected by an independent third-party inspection company. Every 5 years a hazard and operational study (hazop) is performed on the entire hot oil system and the risks possibly found are corrected and thereby the risks are reduced, and the safety of the system is increased. |
| Answer to specific info request 2:  We follow Directive 2014/68/EU through AFS 2017:3 in Sweden: All pressure equipment is operated and inspected by an independent third-party inspection company. The hot oil equipment in our plants have instructions for start, stop and for operation. They are supervised by control systems and by rounds performed by our operators 3 times per day. |
| Answer to specific info request 3:  Each year we sample the PHT present in our hot oil system and have it analysed to make sure the oil is in good quality. We have control programs in place, where operators have a continuous supervision of our hot oil systems and where an independent third-party inspection company inspect all pressurized vessels according to AFS 2017:3. When we have had leakages they have been collected until the leakage can be repaired. Flanges used are tongue and groove or spiral wound packing with metal protection to decrease the leakage risk from the system. Pumps used are hermetic pumps which leaks towards inside of pump. Floor canal is led to an oil lock and then to our wastewater treatment plant, so is not directly released to the environment. The cost of installing containment for our 3 hot oil tank would be 100 000 €. |
| Answer to specific info request 4:  The pipeline for venting from system is released to storage tank of PTF, the valve to the vent pipeline is controlled by a control valve opening when the pressure indicator shows the pressure is high. Drainage system is in place when emptying the PTF system. If PTF would be replaced the scrapped hot oil would be sent to a waste management company for destruction. Spills are historically rare in our plant, often the spills are caught at a very early stage and we then plan to stop as soon as possible to repair the leakage, since the risk of fire increases due to leaked hot oil in insulation. Every 5 years a hazard and operational study (hazop) is performed on the entire hot oil system and the risks possibly found are corrected and thereby the risks are reduced and the safety of the system increased. All wastes, including PHT, is managed by certified waste management companies and spent PHT is being destroyed in energy recovery plants (WTE). |
| Answer to specific info request 6:  PTF is less dangerous to environment than the other hot oil used in our plant. It also has a higher flash point. We have been investigating other alternatives for us to use, but not find any oil which is better environmentally. The PTF used in our plant has a good quality even though we have used it in many years, and it would be unsensible to send it as waste. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3666 | Date:  2022/12/06 11:14  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Italy  Company name confidential:  Yes | Answer to specific info request 1:  Following a brief description of the containment and control measures of our heat trasfer system: - Existence of collection vessel where all the vent exit are collected without any contact with the environment. - Performance of tests to prove the suitability of joints during each stop for maintenance. - Use of containment devices installed beneath flanges and pumps. Some flanges not covered due to some maintenance activity - Use of an inert gas as protection of the fluid against oxidation. - Periodical evaluation of the fluid quality (once a year). - Use of pumps with mechanical seals. - Every day plant parameter are checked (fluid level, pressure temperature) as well as all the HTF circuit parts (valves pumps exchanger). Every week and every months periodically check are provide to all the circuit |
| Answer to specific info request 2:  PED directive is the reference law for plants that use HTF in their process and set out the rules that must be followed since the plant projecting activity (so before building up the plant) and is comprehensive as well of rules related to the priodical inspection of the component subject to ths directive. |
| Answer to specific info request 3:  As mentioned in the reply on point 1, we have a lot of control measurements. All the HTF circuit is under control and completelly closed. all the venting part are collected into a emergency vessel without any exposure to the environment. Activities like top up or refill of the plant are managed trought the emergency vessel as well where a pumps helps to push up and down the fluid. In case of leakeges from valves or tubes, fluid is collected on an industrial pavimentation and is confined so it cannot have contact with the environment (ground). |
| Answer to specific info request 4:  Just mentioned in point 3. Top up, drains and any other activity related to the HTF are confined or managed in a closed system trough the emergency vessel. We don't have any information on the likelihood and severity of accidental releases of terphenyl hydrogenated. In case of small leakages of HTF this quantity is managed following the national rules on waste management. |
| Answer to specific info request 5:  For sure is really important for renewable energy. We are a company with a biomass plant (renewable energy) and we are using PHT as HTF in a closed system to provide electrical and thermal energy. So for us is mandatory to use this type of HTF cause is the only one capable to provide thermal resistance on our working temperature. |
| Answer to specific info request 6:  No alternatives are existing on the market for that application. As explained PHT is the only one that can be used for such temperatures (we are working normally at 305°C) being capable to resist and to transfer heat in a liquid phase. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3669 | Date:  2022/12/12 12:26  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Italy  Company name confidential:  Yes | Answer to specific info request 1:  SEG is using PHT as heat transfer fluid into a closed and controlled circuit to provide energy and heat. All the circuit parts are periodically controlled and maintained in a fully good status through a programmed maintenance plan. There´s not the possibility of an environmental release of the therma oil. All the vent part are collected to the security vessel in a closed circuit so there is not possible environmental contact. The eventual heat transfer fluid downloaded from the circuit is disposed in accordance to the national waste rules. Circulating fluid is normally checked with an analysis once per year. |
| Answer to specific info request 2:  PED rules is the law we are following with, since the project status. It set out control measurement for the diathermic oil circuit and for quite all the stuff that composed an HTF plant. |
| Answer to specific info request 3:  We have in place control measurement that are mandatory for a plant that is working with a Diathermic fluid at 275 °C. Pumps seal are present and are double with an automatic sensor that let us know of eventually leakage. All the vent part of the circuit are collected in a closed circuit to the emergency velles. There´s a sampler provided to sample the fluid for the periodical analysis that permit to collect the fluid without any leakage. |
| Answer to specific info request 4:  Top up and refill are managed directly trough the emergency vessel or through the origin package of the fluid. No leakage are present in that operations. We don’t have any advise in terms of accidental or risk leakage cause following our operation is not possible to have leakages. Eventually composite caming from the fluid degradation can be vent out from the system through the expansion vessel and collected in a closed system to the emergency vessel. |
| Answer to specific info request 5:  We are a company that is working in the renewable sector having a biomass plant that is producing electricity and heat through the using of a renewable energy. So the role ao the PHT is so important for us and for renewable energy cause to provide this plant working well we need a stable molecula that can work in a liquid phase at high temperature without trouble. |
| Answer to specific info request 6:  There are not other alternatives that can work at the same temperature in liquid phase with the same thermal stability but without having PBT or VpVb characteristics. Even if there is an alternative it would have the same characteristic in terms of persistence in the environment cause the chemistry provide the thermal stability to the HTF. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3670 | Date:  2022/12/12 12:32  Content:  Hazard or exposure  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Poland  Company name confidential:  Yes | Answer to specific info request 1:  hydrogenated terphenyl is not a hazardous substance, and the conditions of basic safety requirements are sufficient.all substance in the device is prevented from escaping |
| Answer to specific info request 2:  the substance is prevented from escaping into the emissions |
| Answer to specific info request 3:  all substance in the device is prevented from escaping, enough . |
| Answer to specific info request 4:  all safeguards are sufficient to prevent the substance from escaping, |
| Answer to specific info request 5:  in our installation, the manufacturer recommends the use of HTF as the heating medium and we did not look for an alternative. |
| Answer to specific info request 9:  all analyzes are directed to the manufacturer |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3671 | Date:  2022/12/12 12:44  Content:  Hazard or exposure  Environmental emissions  Information on alternatives  Information on benefits  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Poland  Company name confidential:  Yes | Answer to specific info request 4:  We use some collectinng trays below of equipment where is oil to avoid accidental leaks. |
| Answer to specific info request 5:  I think that is possible that renewable energy could develop in slower process. |
| Answer to specific info request 6:  I know that on ORC system is possible to use other fluid but I am not sure what is a value transfer of heat of other liquid |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3672 | Date:  2022/12/14 11:26  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  Thermo Wipptal  Org. country:  Italy | Answer to specific info request 1:  Thermo Wipptal is using PHT in a biomass plant to produce Heat and electricity. PHT is used at high temperature (308°C) in a liquid phase to provide the right power to the circuit. The entire Circuit is completely close and strictly controlled by automatic sensor and measure, like expansion vessel automatic level, automatic leakage sensors on pumps, and automatic valves. In case of emergency circuit is structured to collect the entire volume into an emergency vessel as well as blanketed with nitrogen. All the pumps, tubes, valves are constantly put on control through a periodical maintenance activity and as well controlled by automatic sensor. |
| Answer to specific info request 2:  PED regulation is for sure the rules we follow for the heat transfer circuit since the project status of the biomass plant. It set out rules to be followed for the construction of the plant and, depending on national rules that receive the European directive, set out also periodical control that must be put in place on the HTF circuit. |
| Answer to specific info request 3:  As before mentioned, we just have the following security containment measurement: automatic leakages collection and control system on pumps, htf level on expansion vessel, drain collection of the vented product from circuit to the emergency vessel, and so on. In case of emergency the emergency vessel collect in a closed circuit all the volume of the circuit. |
| Answer to specific info request 4:  We provide top up or eventually refill of the HTF directly from the emergency vessel through a close circuit so no possibility of environmental contact or leakages are possible. Once we vent out from the circuit low boilers, we collect automatically and in a closed circuit those volatile parts that condensate and are collected into the emergency vessel. |
| Answer to specific info request 5:  We are a Company that had invested in renewable resources through the construction of a biomass plant. We need the using of PHT as HTF to provide the right power and producing electricity and heat for teleheating. We cover around 3 mountains citizen with a residential covering average of 6500 peoples (without counting the tourism). So PHT is playing a fundamental rules on our sector. |
| Answer to specific info request 6:  We are using PHT at 308°C in a liquid phase cause it can be stable and in a liquid phase at those temperature. To provide the right thermal stability on that temperature and condition there must be a strong chemical molecule. So other type of alternatives present have not the same working condition on PHT above all looking at the liquid phase at high temperature and thermal stability, that other types of fluid doesn´t have. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3673 | Date:  2022/12/14 13:08  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Czech Republic  Company name confidential:  Yes | Answer to specific info request 1:  Yes, in production. The TH66 is very important in heat and electricity production at system central heating. |
| Answer to specific info request 5:  Yes exatly. HTF (TH 66) is used as heat transfer medium in 100% combustion biomass (wood chips).The TH 66 is heat source for ORC. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3674 | Date:  2022/12/14 14:33  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Austria  Company name confidential:  Yes | Answer to specific info request 1:  operation conditions: HTF is used in in organic rankine Circle with the following temperatures: => max flow temperature: 325°C => nominal flow temperature: 315 °C risk management: => sufficient dimesed emergency cooling circle => optional emergency chimney (depends on local factors) => boiler design according PED/DIN4754 |
| Answer to specific info request 2:  whole plant: => oil is in an closed loop blocked from the atmosphere => yearly inspection and material measurement from boiler tubes => building designed as waterproof tub => design whole plant according DIN EN 4754 => daily inspection of plant => fire-extinguishing device => use where possible welded connection and not flange connection expansion tank: => continuous level measurement for continuous controlling => min level device to shut down the boiler plant Collection tank: => level gauge for weekly inspection => pressure switch MAX to shut down the plant boiler: => flue gas safety temperature measurement to shut down the plant => flue gas safety pressure switch to shut down the plant => oil safety temperature measurement to shut down the plant => oil safty flow switch to shut down the plant emergency cooler: => big cooler to cool down overheated oil to provide steam pumps: => use pumps with double mechanical seal => continuous controlling of pump > temperature > vibration > leakage > suction + pressure measuring Piping: => stress calculation of piping >= DN65 Valves: => using of valves with bellows |
| Answer to specific info request 3:  Building should be designed as waterproof tub |
| Answer to specific info request 4:  low boilers are cooked out from the system and collected in tanks |
| Answer to specific info request 5:  To produce electricity from heat, it is necessary to have a high flow temperature (cannot effectiveness). For this high temperature it is necessary to have an fluid which have an big thermal stability. An restriction on HTF would slow down the development of renewable energy sources. |
| Answer to specific info request 6:  ORC is an cannot process and need an high temperature. To operate with high temperature it is necessary to have an fluid with high thermal stability. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3675 | Date:  2022/12/14 14:36  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  Teleriscaldamento Varna-Bressanone Scarl  Org. country:  Italy | Answer to specific info request 1:  Here in Varna we use Teprhenyl Hydrogenated as heat Transfer fluid for an ORC biomass plant since the beginning (2008). We use the HTF to produce energy and heat for the teleheating of the Varna and Bressanone citizen. HTF is used in a closed and very strictly controlled system. All the fluid is closed in tubes connected with valves and flanges, covered by apposit covering stuff. Pumps are with mechanical seals with automatic leakage detector and moreover on the floor we had also an automatic detector that is checking the eventual fluid level if some leakages occur. Moreover around the pumps there´s a containment box build up in cement that avoid the release of the eventual fluid in other plant parts. The expansion vessel is closed and inerted with nitrogen and with a automatic and digital detector af level and leakages. the only vent part of the circuit is from the expansion vessel and is collected to the emergency vessel in a closed circuit that can collect eventual volatile parts and also the entire volume of the circuit in case of emergency. Annually we use to provide two fluid analysis in order to check the fluid status. |
| Answer to specific info request 2:  Since wen the plant has been build up and projected, also plant manufacturer follows this PED rules that contain all the indication to build up the plant and relative control measurement. We use following this rules to provide periodically control and check on pressure and circuit tube integrity. |
| Answer to specific info request 3:  Please refer to the answer on question n°1. We have a lot of automatic control measurement to avoid leakage of the Thermal oil outside the closed circuit. |
| Answer to specific info request 4:  All the entire closed circuit is filled trough a closed circuit directly from the emergency vessel, so no leakages of HTF are possible with this system during top up or refill activity. All the vented part are collected from a installed degasator trough a closed drum so also here there are not possibility of release in the environment. We don´t have information about several accident during those activity. |
| Answer to specific info request 5:  Varna is a Company that play in the renewable energy sector. We build up a biomass plant that provide energy and heat to the citizen by using a renewable energy. In this plant HTF has a crucial rules so provide the right power to the entire plant and supply the territory demand. So it is mandatory for us that we can use the fluid as per today situation. |
| Answer to specific info request 6:  Thermal oil has been set out by the plant manufacturer since the beginning for this specific application and is the only one that can work at high temperature (around 314°C) in a liquid phase. The thermal stability and liquid phase working capability are mandatory for us and to provide it, there must be a chemical stable molecule like PHT. Other alternatives would have different properties as well and so the design of our plant would be completely reviewed as well as the capability to produce like we are doing today. In the end we don´t think other alternatives can provide the same characteristic in terms of thermal resistance and long life service like Terphenyl hydrogenated do. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3676 | Date:  2022/12/14 14:55  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Italy  Company name confidential:  Yes | Answer to specific info request 1:  In our industrial plant, terphenyl hydrogenated is used at temperature of 280°C at a pressure of 3Bar. We have 2 heaters, therefore 2 separated circuits. Access to the heaters room is restricted to qualified personnel. The HTF circuits are of a closed type with nitrogen pressurized expansion vessels. Our vessels have controlled inlet and outlet nitrogen lines in order to keep them always under the correct pressure. Vessels have also temperature and pressure transmitter with data 8and therefore alerts) sent to our DCS system. There are also locked valves for the main fluid inlet for the vessels, in order to be sure that no one closes the lines by mistakes while pumps are working, avoid a sharp increase of the pressure inside the circuits. Circuits have multiple temperature and pressure controls along the lines, there is also a safety pressure loop, which in case the pressure sharply increases (possibly due to a blockage on the line) it opens a valve which makes the fluid recirculating on the pump as well as shutting the system down. All lines, flanges and valves are insulated with rock wool and alloy sheets, circumscribing risk of spillage and also for personnel protection. |
| Answer to specific info request 2:  All the pressure equipment destined for Europe requires to have a CE mark and the equipment needs to meet all aspects of the directive. All equipment covered by the PED directive must comply with essential safety requirements. This ensures that equipment are structurally compliant with containing HTF ensuring the safety of the personnel. Our expansion vessels are PED compliant, and so far no incidents or leakage have been reported. |
| Answer to specific info request 3:  All our transfer lines have no valves or flanges. All valves and flanges are placed inside plants or HTF heater room. Plants and HTF heaters room have retention walls to ensure that in case of leakage, fluid is conveyed to a containment tank ensuring there is no spillage to external environment. |
| Answer to specific info request 4:  Being our HTF circuits of a closed type with nitrogen pressurized expansion vessels, this avoids that any moisture gets inside the system, increasing the life of the fluid. So far we have had no reasons to dispose large amounts of terphenyl hydrogenated as with periodic analysis and maintenance we keep the fluid in his original conditions and we have had no need to replace it. Top-ups are done throughout an inlet port which is placed inside the heaters room. In here in case of spillage, the fluid is conveyed inside a container tank and can be recovered in his original conditions. |
| Answer to specific info request 6:  In our plants, HTF is used for FAME distillation and for oil esterification/deacidification as base for producing FAME. In our conditions the use of silicones is NOT possible mainly due to the high viscosity making it very hard to be pumped inside the lines at ambient temperature. Mineral oils hardly can be used at temperature of 280°C and also lifespan for these oils is way lower when compared to HTF based on terphenyl. The use of Mineral oils in our system is NOT an option. Biphenyl HTF have a very low flash point, NOT suitable for our circuits. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3677 | Date:  2022/12/14 15:16  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Czech Republic  Company name confidential:  Yes | Dossier submitter response: |
| RAC Rapporteurs comments: |
| SEAC Rapporteurs comments: |

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| 3678 | Date:  2022/12/14 16:05  Content:  Scope or restriction option analysis  Environmental emissions  Description of analytical methods  Information on benefits  Type:  Individual  Country:  Poland | General Comments:  We use thermal oil that contains the substances indicated in the study, but so far we have not recorded any negative environmental impact. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3679 | Date:  2022/12/15 11:20  Content:  Hazard or exposure  Environmental emissions  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Italy  Company name confidential:  Yes | Answer to specific info request 1:  Heat transfer fluids partially degrade at high temperature. For this reason, a periodical top-up is needed. Our consumption is about purging of low boiling that are formed (5 tons per year). The quantity of HTF used for top-up is about 3% of the total quantity ( 180 tons). Top-up is done using a pump which suction is submerged in terphenyl hydrogenated drum and the discharge side is connected with the heat transfer fluid collection tank. Workers are equipped with appropriate PPE, which take account of exposure limit values (heat-resistant gloves, half mask with ABEK1P3 filters, face shield for pressurized fluids and quadrivalent clothing). In this way workers and environmental exposure is minimized. The decomposition products of terphenyl hydrogenated are collected in the totally closed system into a vent line, condensed and send in a dedicated collection tank, so there is no workers and environmental exposure to these by-products. Sampling and analysis is done by qualified and adequately trained personnel equipped with appropriate PPE which take account of exposure limit values. Storage vessels are equipped with containment system. |
| Answer to specific info request 2:  The first Heat transfer fluid circuits of the site have been realised previously with respect to the Pressure Equipment Directive, but have been designed, constructed and tested in a similar rigorous way. The latest circuits have been realised according to the PED. Operating conditions are well within the limits of design conditions. RMM include safety valves, instrumentation like pressure and temperature switches and appropriate BMS and DCS for process control. |
| Answer to specific info request 3:  To minimize the possibility of incidents and the consequent potential exposure of the environment to the substance, there are some specific safeguard implemented. The plant layout made a distinct separation of the main process plant and equipment where the heat transfer fluid is used, and the storage vessels which are located at a significant distance. In case of incidents, like fire, the entire Heat transfer fluid content of the plant can be drained rapidly using a few drain valves only. The storage vessels which are located outside have a containment system (basin) which can accumulate the entire Heat transfer fluid content in case of a leakage. In case of a fire, the fire water used in the Heat transfer fluid areas which is potentially contaminated, is directed to a fire water retention pit in order to be treated. All Heat transfer fluid areas either inside process building and all outside areas are paved. The Heat transfer fluid expansion vessel is equipped with an automatic valve which will be closed in case of an emergency such that its content is confined. All safety valves are relieved to a closed system. Components of the Heat transfer fluid system are considered critical for the environment and as such have a dedicated maintenance schedule. |
| Answer to specific info request 4:  The entire system is designed using high quality components which require limited maintenance. Valves have bellows and weld ends. Flanged connections are reduced to an absolute minimum. All pumps have mechanical seal with quench system. All pumps have stand-by installed, which facilitate maintenance activity without the need of a general plant stop and consequent production loss. Opening of the equipment and pipes for maintenance purposes is regulated by specific procedures to minimize human and environmental exposure. Workers are equipped with appropriate PPE which take account of exposure limit values. The personnel is adequately trained and equipment, vessels and pipes are drained in a closed system. Storage vessels are equipped with containment system. The replacement of the HTF can be realised without spills as the fluid to be replaced can be drained using the closed drain system to the drain and storage vessels. From these vessels, the fluid can be pumped into a road tank for proper disposal. The fluid for refilling of the system is pumped from the road tank directly into the storage vessel. In case of plant decommissioning, the HTF could be drained using the closed drain system to the storage vessel. From the storage vessel the fluid could be pumped for re-use in other HTF systems at site (top-up and refill). |
| Answer to specific info request 6:  The use of a heat transfer fluid is essential for our production. Polymerization needs high temperatures and the heat transfer fluid must be chosen accordingly. Non-pressurized system is to be preferred, mainly for safety reasons, but also because it is simplest to operate. As mentioned above, there are no alternatives with similar chemical and physical properties of terphenyl hydrogenated that are not PBT or suspected PBT. The use of these substances leads to the same potential environmental problems of the terphenyl. On the other hand the use of other substances have an high impact on our plant in terms of costs, operations and maintenance as mentioned above. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3680 | Date:  2022/12/15 13:29  Content:  Hazard or exposure  Description of analytical methods  Information on alternatives  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Netherlands  Company name confidential:  Yes | General Comments:  Ketelruimtes zijn afgeschermd en worden elek jaar geinspecteerd. Oliemonsternames, Alternatieven die geschikt zijn tot de benodigde temperatuur zijn niet voorhanden of even schadelijk. Totale ruimte is voorzien van een sprinklerinstallatie, belangrijkste ketelruimtes zijn voorzien van vloestofdrempels. |
| Answer to specific info request 4:  Vloeistofdichte vloeren, en stalen lekbakken zijn aanwezig. Verder spillkits Oude olie wordt via oliehandel afgevoerd. |
| Answer to specific info request 6:  Gezien onze processen/temperaturen is een minerale olie niet geschikt. Verder zijn onze processen gekwalificeerd en is elke mogelijke aanpassing van een processtap onderhevig aan nieuwe kwalificaties, die jaren kunnen duren. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3681 | Date:  2022/12/15 14:30  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Spain  Company name confidential:  Yes | General Comments:  No more comments needed. |
| Dossier submitter response: |
| RAC Rapporteurs comments: |
| SEAC Rapporteurs comments: |

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| 3683 | Date:  2022/12/16 07:11  Content:  Scope or restriction option analysis  Hazard or exposure  Environmental emissions  Baseline  Description of analytical methods  Information on alternatives  Information on benefits  Other socio economic analysis (SEA) issues  Transitional period  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Romania  Company name confidential:  Yes | Answer to specific info request 1:  ORC Plant |
| Answer to specific info request 4:  According to oil analisis. |
| Answer to specific info request 6:  For ORC Plant it is important to have the same heat transfer propriety. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3684 | Date:  2022/12/16 11:26  Content:  Scope or restriction option analysis  Hazard or exposure  Description of analytical methods  Information on alternatives  Type:  BehalfOfAnOrganisation  Org. type:  National Authority  Org. name:  <redacted>  Org. country:  Poland  Company name confidential:  Yes | Answer to specific info request 1:  The plant is state-of-the art and tight. PHT is used in a strictly controlled closed system and under operational controls to avoid any releases, according to the standards . We have risk management measures in place, e.g. collection of spills if they occur, fully paved surfaces, preventive maintenance, personnel training, frequent plant inspections . All waste potentially containing PHT is collected and disposed of at qualified waste management companies and disposed of in accordance with the law. |
| Answer to specific info request 2:  The heat exchange system was made according to the standard and meets the requirements of Directive 2014/68/EU |
| Answer to specific info request 3:  Special safety measures are being implemented to avoid or reduce HTF leaks from pipelines or equipment through visual inspections, analytical In areas of highest risk, we have trays drainless trays (confined spaces) with pumps to pump out any leaks, but the trays are not are everywhere on the installation. Leaks are detected automatically. The loss of HTM in the HTF system will be detected by a drop in the level in the tank |
| Answer to specific info request 4:  Periodic quality assessment (at least once a year) is performed at the manufacturer. The results over a working period of 4 years showed no need for replacement heating oil. |
| Answer to specific info request 6:  There is no alternative to Terphenyl, hydrogenated (PHT). The two other substances which can be used have similar PBT properties and thus regrettable substitution would occur. PHT has the needed stability and remains in service for a long time (e.g. 20 years). Therefore, minimal top-up and refill is needed. In case PHT is banned, new installation needs to be build, but not in EU. PHT operates in the temperature widow which you need for your manufacturing of Polyamide 6. |
| Answer to specific info request 9:  Liquid chromatography, quantifiability from 1ppm in water |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3685 | Date:  2022/12/16 12:08  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Luxembourg  Company name confidential:  Yes | Answer to specific info request 1:  Operating temperature of 250 - 300 degrees, pressure of 3 - 3,5 bar Risk management : installation fully contained, SIS for temperature and pressure controlled by accredited company on a yearly basis. Regular leak control by operators. Full Process Hazard Analysis every 5 years |
| Answer to specific info request 2:  We fully apply the PED regulations on the equipment (X-ray control for weldings, qualification control, pressure tests...) |
| Answer to specific info request 3:  Our installation is in a dike, which is regularly controlled for tightness. Regular control by operators. |
| Answer to specific info request 4:  We have a closed system with an expansion vessel, under a nitrogen blanket. Degradation is controlled on a yearly basis, refilling / top-up / exchange made according to the measurements results. The analysis are done by a contractor. Waste material is collected in dedicated drums and taken by a local authorised company for disposal. |
| Answer to specific info request 5:  No changes planned for the close future. |
| Answer to specific info request 6:  The analysis for alternatives for the use of terphenyl, hydrogenated as HTF is part of our Process Hazard Analysis 5-year review, we considered our installation not suited for any other HTF alternative. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3686 | Date:  2022/12/16 12:25  Content:  Hazard or exposure  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Poland  Company name confidential:  Yes | Answer to specific info request 1:  security control |
| Answer to specific info request 4:  no oil leaks |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3687 | Date:  2022/12/16 13:14  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Industry or trade association  Org. name:  <redacted>  Org. country:  Spain  Company name confidential:  Yes | General Comments:  Terphenyl hydrogenated is used as a heat transfer fluid (HTF). |
| Answer to specific info request 1:  PHT is used as an HTF within a closed loop system. Closed loop process parameters (temperature, level and flow) are controlled from the distributed control system in an automatic mode. During operation, special attention is paid to the draining points, joints, mechanical seals, flanges, valves, etc. PHT pumps do not use mechanical seals. Instead of that we use magnetic and canned pump to avoid any PHT leakages. Annual test of fugitive atmospheric emissions of suspended particles, sedimentable particles is carried out in compliance with the Integrated Environmental Authorization. |
| Answer to specific info request 2:  Technical protection methods: • Existence of general leakage collection systems. • Retention systems in pumps and valves to ensure that any leakage of PHT through the seals is safely drained off and collected in a contained area. • PHT temperature, flow and level monitoring. • Low-boiling fractions, formed as breakdown products of PHT at high temperatures are venting from the system through the expansion tank to a blowdown stack. The residuals are collected in a dedicated process sewer from where it is pumped into drums to be treated by an authorized external company. • Also, special containment measures are taken during shutdown and start-up of the process, and drain, fill, top-up, and disposal operations of degraded PHT to prevent and contain any leakage. |
| Answer to specific info request 3:  - Periodical sampling program of the PHT for aging status follow up. - To prevent the vent to the atmosphere there is in place a blowdown stack system which collect Low-boiling fractions, formed as breakdown products of PHT at high temperatures. The residuals are collected in a dedicated process sewer from where it is pumped into drums to be treated by an authorized external company. - There is general and specific training for all the operators at the plant. - All the operators use checklist for all the activities. - Legal inspections are carried out annually in compliance with the royal decree 840/2015 of control of the risks inherent to major accidents in which dangerous substances are involved (transposition of Directive 2012/18/EU into Spanish legislation), as well as compliance with the requirements of ISO 45001:2018 standard, where all these items are reviewed by the authorities. - Measurements in industrial hygienic are included in the annual inspections according to the legislation in place. |
| Answer to specific info request 4:  - HTF is replaced during Plant Overhaul when the oil is at room temperature and we take special measurement to avoid and content any HTF spill. - Each tank has a containment bucket to prevent any spill. - Additionally there are procedures on how to operate the system. These procedures describe safety measures. - All risk assessments are included in the Safety report and in the Internal emergency plan, in compliance with the royal decree 840/2015 of control of the risks inherent to major accidents (transposition of Directive 2012/18/EU into Spanish legislation). - The residuals are collected in a dedicated process sewer from where it is pumped into drums to be treated by an authorized external waste management company. |
| Answer to specific info request 6:  HTF closed loop is design only for been used with PHT. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3689 | Date:  2022/12/16 14:15  Content:  Information on benefits  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Hungary  Company name confidential:  Yes | General Comments:  There is no alternative to Terphenyl, hydrogenated (PHT). The two other substances which can be used have similar PBT properties and thus regrettable substitution would occur. PHT has the needed stability and remains in service for a long time (e.g. 20 years) in a closed loop heat transfer system. Therefore, minimal top-up and refill is needed. In case PHT is banned, new installation needs to be build, but not in EU. PHT operates in the temperature widow which you need for production. Our plants are state-of-the art and tight. PHT is used in a strictly controlled closed system and under operational controls to avoid any releases, according to the standards. Risk Management Measures are implemented, e.g. collection of spills if they would occur, fully paved, preventative maintenance, training of staff, frequent inspections of the plant. All potentially PHT containing waste is collected and disposed of at certified/qualified waste management companies, so no emissions via End of Life. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3690 | Date:  2022/12/16 14:34  Content:  Scope or restriction option analysis  Hazard or exposure  Environmental emissions  Baseline  Description of analytical methods  Information on alternatives  Information on benefits  Other socio economic analysis (SEA) issues  Transitional period  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  International organisation  Org. name:  <redacted>  Org. country:  Poland  Company name confidential:  Yes | Answer to specific info request 1:  The plant is state-of-the art and tight. PHT is used in a strictly controlled closed system and under operational controls to avoid any releases, according to the standards. |
| Answer to specific info request 3:  Joints between installation elements are so tight that there is no possibility of potential leaks in any place. However, when a small amount is spilled during the collection of the sample for testing, then the oil sorbent is used and then the whole is cleaned with a cleaning cloth and then it is removed to the authorized waste treatment plant. All potentially PHT containing waste is collected and disposed of at certified/qualified waste management companies and incinerated to use the high calorific value of PHT, so no emissions via End of Life. In case PHT is banned, new installation needs to be build, but not in EU. |
| Answer to specific info request 4:  PHT has the needed stability and remains in service for a long time (20 years). Therefore, minimal top-up and refill is needed. |
| Answer to specific info request 6:  There is no alternative to Terphenyl, hydrogenated (PHT). The two other substances which can be used have similar PBT properties and thus regrettable substitution would occur. PHT operates in the temperature widow which you need for PET production. |
| Answer to specific info request 9:  We do not have information on analytical methods, but Therminol is sent for check-ups every six months |
| Answer to specific info request 10:  Triphenyl is in a closed circuit and there is no possibility of actual contact with the product at any stage of the process |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3691 | Date:  2022/12/19 09:53  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Italy  Company name confidential:  Yes | Answer to specific info request 1:  Alperia has a plant in Silandro which is a biomass plant working with Terphenyl hydrogenated at high temperature (310 celsius) to provide enegry production and heat to the citizen di Silandro. THe plant is using PHT in a closed system strictly controlled by manual and authomatic control measurements. Pumps and flanges are protected from leakages by insulation covering system (for flanges) and authomatic leakages detector for pumps that show us immediatelly if any leakages is present. The expantion vessel is inerted and closed and all the vent part from eventually venting activity are collected in a closed drum. All the vent part of the circuit are collected to the emergency vessel that can be used as well to downolad the entire volume of the circuit in case of emergency. So all the plant is controlled in order to avoid any leakage or emission to the environment. Fluid is also controlled more than once per year with an analysis to provide the parameters check. |
| Answer to specific info request 2:  PED regulation is the rules we have to follow for a plant that is working with a diathermic fluid. This rules have been taken in consideration since the project activity for the entire biomass plant. It set out also control measurement that must be taken in place for the safety of the plant. Normally the heater manufacturer provide those controls in our plant. |
| Answer to specific info request 3:  Please have a look on the answer at point 1. We had automatic leakage sensor on pumps, insulating covering system on flanges, vent collected to the emergency vessel that is used as well to contain the entire volume of the plant in case of emergency. So not possibility to contact with environment. |
| Answer to specific info request 4:  As before described all the venting part are collected from the expansion vessel to a separate drum with a closed circuit that contain any emission of volatile compostie we drain out from the htf circuit. All the top up or refill activity are provided from a separate vessel that we use to fill the circuit. This separate vessel is filled from the original package by a closed circuit with a dedicated pump. So one more time no possibility of environmental release of PHT. |
| Answer to specific info request 5:  We are a Company that has invest in renewable energies also throught a biomass plant (so renewable energy) that provide heat and energy to the citizen of Silandro. So for us is really important that we can use PHT as we are doing since the start up of the plant to continue providing this activity. |
| Answer to specific info request 6:  PHT is a stable molecule that can work at high temperature in a liquid phase with a long service life and trouble shutdown. Other alternatives have different parameters and cannot provide the same heat exchange and resistance capability in a liquid phase of PHT. Moreover all the plant design has been maden considering PHT as unic fluid (heater, pumps, flanges, and so on). So is not possible to consider any other alternatives cause it means decommissioning and rebuild the plant. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3692 | Date:  2022/12/19 10:03  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  Individual  Country:  Germany  Privacy statement:  x | General Comments:  x |
| Dossier submitter response: |
| RAC Rapporteurs comments: |
| SEAC Rapporteurs comments: |

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| 3693 | Date:  2022/12/19 10:22  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Industry or trade association  Org. name:  <redacted>  Org. country:  Italy  Company name confidential:  Yes | General Comments:  Terphenyl, hydrogenated is used in our production sites as a heat transfer fluid (HTF) in high temperature, non-pressurised closed manufacturing systems. HTF is known for its thermal stability at temperature up to 300°C. Since 1980 we are using terphenyl hydrogenated with no incident, leakage, or accident, therefore no exposure to the environment. If we do not consider the substances chemically similar, with the same eco-tox properties (i.e. vPvB) whose inclusion in the SVHC list has to be regarded as a matter of time, the alternatives to PHT - as far as we know - do not have the same features at high temperatures and do not guarantee the same level of performances. The overall costs of PHT substitution would be very high for our company. Moreover, the equipment might need to be modified due to the usage of a different HTF. Indeed, some pieces of equipment have been designed for a specific range of working temperatures and/or pressures. Should these process conditions change because of the different features of the HTF, some pieces of equipment would need replacement. It means that the whole cost of PHT replacement could increase significantly. Substitution with alternatives which do not guarantee the same level of performance would result in an increase of our energy consumption and our carbon dioxide emissions. Additionally, the suitability of the alternatives might be questionable because of their lower thermal resistance to high temperature and lower energy efficiency during the heat transfer process. This meaning an increase in the overall energy cost. Lastly, should the replacement of some pieces of equipment be needed, this would require the stop of the production for a long period of time, and would expose the Company to the risk of some of its products being phased out of the market. |
| Answer to specific info request 1:  The substance is only used as an HTF in closed system, in industrial settings with no worker exposure during operations. If a piece of the equipment need maintenance, cleaning up is carried out in advance to avoid worker exposure during those activities. Further risk management measures are described in the operational procedures we have in place to protect worker health and avoid any leakage to the environment. |
| Answer to specific info request 2:   The Pressure Equipment Directive (PED) apply to heat transfer systems containing terphenyl hydrogenated. Some pieces of equipment (i.e. heating coil on vessels) are designed, built and periodically tested according to the PED requirements. |
| Answer to specific info request 3:  Technical protection methods in place at our sites are summarised below. o Collection vessels are installed in plants where there are the highest quantities of HTF. o Joints are tested under nitrogen pressure before start-up after yearly maintenance activities at most of our HTF plant. Daily check for joint leakages are carried out by shift operators in all our plants. o Most of the pumps have a containment. o Inert gas (nitrogen) is used in all plants to protect against oxidation. o Yearly checks are carried out to verify the quality of fluid at all our plants. In some case, twice a year. o Some of our pumps are magnetically driven. All the other are equipped with mechanical seals. o Most of our valves are with mechanical seals. o Inspection by competent technical bodies is carried our periodically at most of our plant. o Control programs for potential leakages are in place. o Low switch levels (LSL) are installed in all our expansion vessels Most of the technical means of containment have been installed at the time the annual production plant when built. Therefore, operational costs of safety measure in place are mainly related to activities such as inspection, training and compliance with operational procedures. In addition, there are costs associated to the use of inert gas as a protection of against fluid oxidation. Therefore, overall yearly costs of safety measure in place can be estimated in 10.000 € for each plant were PHT is used. |
| Answer to specific info request 4:  Technical protection methods in place at our sites are summarised below. o Collection vessels are installed in plants where there are the highest quantities of HTF. o Joints are tested under nitrogen pressure before start-up after yearly maintenance activities at most of our HTF plant. Daily check for joint leakages are carried out by shift operators in all our plants. o Most of the pumps have a containment. o Inert gas (nitrogen) is used in all plants to protect against oxidation. o Yearly checks are carried out to verify the quality of fluid at all our plants. In some case, twice a year. o Some of our pumps are magnetically driven. All the other are equipped with mechanical seals. o Most of our valves are with mechanical seals. o Inspection by competent technical bodies is carried our periodically at most of our plant. o Control programs for potential leakages are in place. o Low switch levels (LSL) are installed in all our expansion vessels Most of the technical means of containment have been installed at the time the annual production plant when built. Therefore, operational costs of safety measure in place are mainly related to activities such as inspection, training and compliance with operational procedures. In addition, there are costs associated to the use of inert gas as a protection of against fluid oxidation. Therefore, overall yearly costs of safety measure in place can be estimated in 10.000 € for each plant were PHT is used |
| Answer to specific info request 5:  Internal operational procedures have been adopted for draining, re-filling and disposal of the degraded HTF. These procedures, in addition to the technical means in place, are designed to prevent spills and releases in the environment. Since 1980 we are using terphenyl hydrogenated with no incident, leakage, or accident, therefore no exposure to the environment. Quantities released during maintenance activities are absorbed and disposed of according to applicable law. In addition, due to the stability of terphenyl hydrogenated we had only few occasions in which the HTF was replaced. Technical protection means and operational procedures are in place to minimize the risks of spills or accidental releases to the environment. When the HTF need replacement (typically when degraded), it is disposed of as a waste and sent to an external incinerator for proper treatment. Disposal is carried out according to the applicable legislation and managed by certified waste management companies. Spent PHT is being destroyed in energy recovery plants. Roughly 10-15 mc of HTF are disposed of annually as an average. |
| Answer to specific info request 6:  To our knowledge, Terphenyl hydrogenated is the most performing thermal oil in the market (in terms of temperature resistance). It is been used for applications above 300°C. Activities developed by our company have shown that there is a very limited number of possible alternatives. These alternatives are less performing and have a shorter lifetime, especially when used at temperatures above 300°C. Furthermore, and up to our understanding, these alternatives are also as critical as PHT to the environment, even if the chemical nature of these alternatives might be different. Indeed, the molecules of a high temperature heat transfer fluid are stable and therefore by definition they are neither bio-degradable, nor degradable at all. To our knowledge, mineral oils could be considered viable alternatives to the PHT. However, they can’t be used at temperature up to 300°C (as in the case of PHT). To use mineral oils, we would need to revise our processes and to replace some pieces of equipment. Furthermore, the whole efficiency of the processes will decrease. Even if we do not have accurate figures, we estimate that the associated cost cannot be sustained by the business. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3694 | Date:  2022/12/19 11:10  Type:  Individual  Country:  Poland | Answer to specific info request 1:  . |
| Answer to specific info request 2:  . |
| Answer to specific info request 4:  . |
| Answer to specific info request 5:  . |
| Answer to specific info request 6:  . |
| Dossier submitter response: |
| RAC Rapporteurs comments: |
| SEAC Rapporteurs comments: |

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| 3695 | Date:  2022/12/19 12:33  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  ExxonMobil Chemical Holland B.V  Org. country:  Netherlands | General Comments:  PHT is used as a Heat Transfer Fluid (HTF) at the ExxonMobil Rotterdam Phthalic Anhydride Plant. The comments below and the answered questions are only shared on behalf of this specific plant. PHT is used as a HTF in a closed loop system – consisting of a furnace, a storage drum, an expansion drum, circulation pumps, and safety system – to supply the heat required to operate the product refining section of the plant. The PHT is crucial as a HTF for the plant, without it, the plant cannot operate, and production of phthalic anhydride (PAN) is stopped.  The Rotterdam Phthalic Anhydride Plant is fully integrated into the ExxonMobil Rotterdam Plasticizers Plant which produces phthalate esters. The phthalate esters are sold on a B2B market as Plasticizers. The production of Plasticizers would be directly impacted if the Rotterdam Phthalic Anhydride Plant is stopped. If PHT is no longer available as a HTF it is possible that PAN manufacturing will become infeasible or uncompetitive in Europe. PAN is used in the manufacture of Plasticisers (and several other chemicals) that are essential in the automotive and construction industries. Access to competitively priced materials to support these industries allows consumer to have access to items that are key to modern living standards. Deselection of PHT could have an impact that would be felt by consumers and could also lead to job losses in some very important industries. |
| Answer to specific info request 1:  a. PHT is used as a HTF to supply heat required in various processes and equipment to refine crude product containing undesired by-products into final product which complies with our internal product specifications. The HTF is circulated through a closed loop system with circulation pumps. A furnace is used to burn fuel, the released heat of which is transferred to the HTF by circulating the HTF through coils in the furnace. The HTF is operated at a constant operating temperature above 300 degrees Celsius. This process is critical for the operation of the plant as the full crude product refining section depends on the HTF to drive the required processes. b. Various risk management measures are in place to ensure the operation of the HTF system is done safely. The plant control and safety systems are governed by robust requirements and procedures which are checked and reviewed on a regular basis. Furthermore, the safety system is independent from the control system. Safety critical equipment is tested on set intervals to ensure their availability is within the set requirements. Focusing more on the HTF system, the control system’s and safety system’s primary objective is to ensure a predictable mode of operation which in turn prevents operational upsets that could lead to safety incidents. The result of this is that emissions of the PHT are minimized. In industry, over-pressure scenarios are examples of incidents in which emission of substances can occur via the let-down of the over-pressure via safety relief valves, vents, rupture discs, etc. An over-pressure scenario in the discussed PHT HTF system for the Rotterdam plant does not directly result in an emission of the PHT, except possibly for very limited amounts in the extreme overpressure scenario described below. The HTF system is fitted with a cold expansion drum into which the over-pressure in the HTF loop can safely expand. The expansion drum is fitted with a nitrogen blanketing system and safety relief valves. Should the pressure in the expansion drum become too high, then the safety relief valves will relieve the pressure. The nitrogen blanketing on the expansion drum prevents as much as possible the emission of PHT in this over-pressure scenario. |
| Answer to specific info request 2:  a. Equipment and pipeline health is monitored periodically for legal inspections to ensure mechanical integrity, minimizing the chances for emissions of PHT. b. Internal equipment strategies are in place for equipment and pipelines. The equipment strategies are used to assess equipment and pipeline health as well as to set guidance to keep these healthy for the long-term. The equipment strategies are a combination of modelling and observations/data from field-inspections. The combination of this information allows proactive maintenance rather than reactive maintenance, minimizing the chances for emissions of PHT. |
| Answer to specific info request 3:  Assuming good equipment and piping mechanical integrity, the most likely points for leakages are pumps, flanges, and left-open sample-points. a. Pumps usually develop a leakage due to faulty seals allowing the substance to leak outside the pump housing. The pumps used to circulate the PHT in the HTF system have a seal-less design making them incredibly reliable and unlikely to develop a leakage. The pumps are placed on liquid tight flooring, so if a leakage were to occur it would not be able to seep into the ground. b. Considering flange-connections, all flanges in the HTF system are placed above liquid tight flooring – if a leakage were to occur then it would not be able to seep into the ground. c. The third option, a sample-point which has been left open: it is unlikely emission of PHT to the environment would occur via a left open sample-point. Taking HTF samples is an uncommon occurrence, and it is fully governed by a special procedure aimed at preventing any emission and this procedure must be followed. It is a practice which requires a significant amount of attention and involvement making it extremely unlikely that a sample-point would inadvertently be left open. Furthermore, if this were the case, the liquid tight flooring would prevent the PHT from seeping into the ground. d. Any leakage on the liquid tight flooring is collected in a dedicated collecting system and processed accordingly. |
| Answer to specific info request 4:  a. Analysis of the PHT is done at set intervals to keep track of the PHT quality and the presence of low-boiling and high-boiling degradation products. The HTF loop system has nitrogen blanketing reducing the chance of releasing these low-boiling and high-boiling degradation products as emissions. b. Partial replacement of HTF or topping-up the system is uncommon practice and is only done when fully prepared. Both actions are governed by special procedures aimed at preventing any emissions and are executed by trained and experienced personnel. Part of the preparation includes identification of possibilities for spillage – appropriate measures of mitigation are put in place for any each of these possibilities. c. Waste containing PHT is disposed of in accordance with regulations and governance. Certified waste management companies are used to transport and process PHT containing waste. Spent PHT is destroyed in energy recovery plants. |
| Answer to specific info request 6:  a. PHT is currently considered to be the best option as HTF for our system. An alternative would need to have highly similar physical and chemical properties, as well as environmental, regulatory, and economic feasibility in order to qualify as viable and compatible for the system. The alternative HTF would likely require adaptation to the existing system, and if changes were needed to be made to the system as a whole due to the incompatibility of an alternative HTF with the existing system, this would require significant time and financial investment for the investigation, engineering, re-design, and execution which is expected to run into millions of euros. Starting an investigation and possibly qualifying alternatives to HTF would require significant time and financial investment. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3696 | Date:  2022/12/19 12:57  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Germany  Company name confidential:  Yes | Answer to specific info request 1:  As an industrial company using heat transfer fluids we´re using written SOPs and risk analysis, the equipment is examinaed by a certified expert once a year, we have to do mandatory checks of the equipment according to the Pressure Equipment Directive |
| Answer to specific info request 2:  As an industrial company using heat transfer fluids we´re using written SOPs and risk analysis, the equipment is examinaed by a certified expert once a year, we have to do mandatory checks of the equipment according to the Pressure Equipment Directive |
| Answer to specific info request 3:  this equipment is also regulated by national law as an equipment with substances hazardous to water, so the requirements of this have to be fulfilled and are including such measurements |
| Answer to specific info request 4:  As terphenyl has a high operation temperature and we´re using this 50 degrees below this temperature, we haven´t to exchange this heat transfer fluid for more than 15 years. Our equipment is checked regulary we do not have incidental spilling of this, regarding the waste, see above. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3697 | Date:  2022/12/19 13:19  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  GJ Grupa  Org. country:  Latvia | General Comments:  There is no alternative to Terphenyl, hydrogenated (PHT). The two other substances which can be used have similar PBT properties and thus regrettable substitution would occur. PHT has the needed stability and remains in service for a long time (e.g. 20 years). Therefore, minimal top-up and refill is needed. In case PHT is banned, new installation needs to be build, but not in EU. PHT operates in the temperature widow which you need for ORC installations. |
| Answer to specific info request 1:  There is no alternative to Terphenyl, hydrogenated (PHT). The two other substances which can be used have similar PBT properties and thus regrettable substitution would occur. PHT has the needed stability and remains in service for a long time (e.g. 20 years). Therefore, minimal top-up and refill is needed. In case PHT is banned, new installation needs to be build, but not in EU. PHT operates in the temperature widow which you need for ORC installations. |
| Answer to specific info request 6:  There is no alternative to Terphenyl, hydrogenated (PHT). The two other substances which can be used have similar PBT properties and thus regrettable substitution would occur. PHT has the needed stability and remains in service for a long time (e.g. 20 years). Therefore, minimal top-up and refill is needed. In case PHT is banned, new installation needs to be build, but not in EU. PHT operates in the temperature widow which you need for ORC installations. The plant is state-of-the art and tight. PHT is used in a strictly controlled closed system and under operational controls to avoid any releases, according to the standards (list some). Please mention as well some Risk Management Measures you are taking, e.g. collection of spills if they would occur, fully paved, preventative maintenance, training of staff, frequent inspections of the plant. All potentially PHT containing waste is collected and disposed of at certified/qualified waste management companies and incinerated to use the high calorific value of PHT, so no emissions via End of Life. |
| Answer to specific info request 12:  The plant is state-of-the art and tight. PHT is used in a strictly controlled closed system and under operational controls to avoid any releases, according to the standards (list some). Please mention as well some Risk Management Measures you are taking, e.g. collection of spills if they would occur, fully paved, preventative maintenance, training of staff, frequent inspections of the plant. All potentially PHT containing waste is collected and disposed of at certified/qualified waste management companies and incinerated to use the high calorific value of PHT, so no emissions via End of Life. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3698 | Date:  2022/12/19 13:58  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Belgium  Company name confidential:  Yes | Answer to specific info request 1:  During normal operation of the HTF related installations at INEOS Aromatics in Geel, Belgium (2 units using the HTF: PTA2 and PTA3) there is no exposure of the substance to workers. The Oil system is operated as a closed system with only one connection with the outside: the vent stack. This stack is equipped with a knock-out drum to prevent low boilers or oil (in case of relieving scenario) going to atmosphere/environment. During maintenance activities appropriate controls and measures are in place to contain any HTF substance that is leaving the closed system, hence safeguarding the impact to the environment, and to protect people that are executing the maintenance activities. Since the substance is not present in the final product, there is also no consumer exposure. Following measures have been put in place to avoid any exposure or emission of the product: 1) The design, construction, the choice of construction materials is such that the installation is operated as a closed system in normal operation. 2) There is an inspection plan of the hot oil system. 3) The choice of the HTF, with a high level of thermal stability, is such that replacements and additions of fresh HTF are kept to a minimum. 4) Yearly sampling of the HTF is in place to follow up the condition. 5) Procedures and dedicated equipment are in place to unload (and load) the substance from the installation without any spills. 6) Procedures are in place to assure the HTF is safely contained in case of maintenance or inspection on an installation part where the substance is being used. The HTF is transferred to either a dedicated holding tank or to mobile storage facilities, enabling reuse of the HTF after maintenance. 7) Procedures and installations are in place to capture and contain any HTF released in the unlikely event of a process incident. The risk for emissions to the environment is minimized as a result of such infrequent incidents. In the unlikely event of a HTF release to the environment effective spill response plans are in place to mitigate environmental impact. 8) If any HTF is removed from the installation which has a quality below the set specification, this product is disposed of as hazardous waste and handled as such by the waste handler. 9) During loading and unloading operations, operators involved in these activities wear the appropriate PPE to protect the workers in case of accidental exposure. |
| Answer to specific info request 2:  A normal degradation rate of the thermal heat transfer fluid is between 0.1 - 0.2 wt% per week at a temperature of 315 to 320 °C. Note that the degradation rate doubles every 10 °C. For both PTA2 and PTA3, with a combined volume of 240 ton this adds up to 240 x 0.15 wt%/w x 52 w = 18.72 ton/year. The table below illustrates that the degraded amount matches the delivered amount therminol66 to the site (SAP info). (Note that in the years before 2011 the degradation was higher because an older unit (PIA) was still operational at that time. The hot oil volume of PIA was 80 ton leading to 340 x 0.15 wt% x 52 = 26.52 ton/year) Year Amount of Therminol-66 delivered to the site (kg) Degraded amount of therminol-66 (kg) 2002 362940 2003 0 26520 2004 0 26520 2005 20121 26520 2006 50680 26520 2007 0 26520 2008 52000 26520 2009 25260 26520 2010 25140 26520 2011 48980 26520 2012 10040 18720 2013 50360 18720 2014 0 18720 2015 50180 18720 2016 48860 18720 2017 0 18720 2018 0 18720 2019 25200 18720 2020 YTD 0 18720 2002-2020 top up 407821 407160 |
| Answer to specific info request 4:  The low boilers are contained in the vent knock-out drum (see above) which is emptied (closed system) approximately once a month and transferred to a certified waste handler. The high boilers are captured by the hot oil filter. The exchange of the filter elements occurs 2-4 times a year. The used filter elements are transferred to a certified waste handler. Procedures and dedicated equipment are in place to unload (and load) the substance from the installation without any spills. All wastes of the HTF are labelled with the necessary info prior to transferring it to a certified waste handler. |
| Answer to specific info request 6:  INEOS has investigated following alternatives regarding the hazard profiles instead of therminol 66 in the past: 1. Castrol Perfecto HTS 16 2. Fragoltherm 660 3. Paratherm HT 4. Multitherm 660 5. Marlotherm SH 6. Dowtherm No. 1 in the list above: The substance tetrahydro-(1-phenylethyl)-naphtalene is currently under assessment for PBT. Included in CoRAP (Finland is evaluating it). No. 2 and 3 in the list above also contain HTP at a concentration > 0.1% and therefore would also be subject to the same authorization requirement. No. 4 in the above list: This substance contains biphenyls (EC 202-163-5) which is included in the CoRAP list and under investigation by Portugal for suspected PBT properties. This substance was not included in the RMOa of Finland on EC 258-649-2 and 400-370-7. No. 5 in the list above: The substance dibenzylbenzene, ar-methyl derivate and is currently subject to a compliance check by ECHA, requesting additional information relevant to the PBT/vPvB assessment (source RMOA by Finland dd 24/2/2020 regarding EC 258-649 and EC 400-370-7). Most of the data submitters agrees this substance is PBT. No. 6 in the list above: The substance diphenyl (=biphenyl) is under assessment fot BPT, currently in CoRAP (Portugal is evaluating it). INEOS only has practical experience with one other HTF: Marlotherm SH (dibenzylbenzene, ar-methyl derivate; EC n°:258-649-2 (listed no. 5)). This HTF was used in the past, but significant process problems were encountered. The HTF was replaced 20 years ago with Therminol66, the current HTF. The use of Marlotherm SH resulted in process plugging, operational down time and unsafe conditions while cleaning the equipment. Physical properties of the other HTF were collected. However, the most relevant properties for an alternative HTF: heat transfer coefficient and degradation coefficient are not shared in the public domain. Hence it was not possible to perform a screening of these substance for technical suitability. INEOS understanding today is that no other HTF could result in an improved process performance or could result in an improved sustainability of the INEOS process. On the contrary, INEOS fears that alternative HTF’s could result in an inferior process performance and unsafe working conditions, as explained before. The cost of substitution in case of a drop-in alternative, if available and proven equally effective or better than the current HFT, would consist of following elements 1) Cost for search and evaluation of alternative HTF 2) Cost of replacing the HTF a. Cost of material b. Cost of labor c. Downtime of the installation d. Cost of disposal of current HTF The overall cost is estimated to be in the range of 5 mio - 20 mio €. Significant investments would be required to avoid PTA business disruption. For example, both PTA production units share a common cold HTF storage facility. Therefore, a replacement of the HTF would either require a shutdown of the two units at the same time, which is considered an unacceptable PTA business disruption, or the addition of a second THF storage facility. In case of non-drop-in alternative, the substitution requires an investment that has the potential to jeopardize the overall economic viability of the PTA installations at INEOS Aromatics Geel by significantly burdening the return on capital employed to manufacture PTA at the INEOS Geel facilities. These costs would include a significantly longer shutdown period (creating an unacceptable PTA business disruption), replacement of all existing exchangers and piping, and the construction of two high-pressure steam boilers. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3699 | Date:  2022/12/19 14:20  Content:  Scope or restriction option analysis  Hazard or exposure  Information on alternatives  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Slovakia  Company name confidential:  Yes | General Comments:  In our company, the product containing this substance has been used for several years, and we still do not have a replacement. Therefore, we would need more information regarding the reduction of exposure of workers, the environment, safe handling and safe disposal. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments: |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3700 | Date:  2022/12/19 14:37  Content:  Scope or restriction option analysis  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  BUDENHEIM IBERICA SLU  Org. country:  Spain | Answer to specific info request 1:  Los procesos productivos de fabrica están monitorizados en tiempo real con control de Tª y de nivel continuo. Se dispone de personal 24/7 presencial y en guardia. Se dispone de mantenimiento preventivo de los elementos involucrados con el TFH |
| Answer to specific info request 2:  Como equipo a presión se realizan las correspondientes inspecciones periódicas reglamentarias. A la vez se dispone de servicio de mantenimiento anual de las calderas y de todos los elementos que intervienen con el aceite térmico en uso. Se dispone de mantenimiento interno continuo |
| Answer to specific info request 3:  Todos los suelos donde se manipula la sustancia están hormigonados. Se hacen revisiones periódicas del estado del suelo y hay mantenimiento de las instalaciones. Se dispone de cubetos de retención en los puntos que sostienen las bombas. Y se dispone de carros de actuación dispuestos por toda fabrica para actuar y retener cualquier fuga que se pueda dar en el sitio. Luego se gestiona como residuo peligroso con gestor autorizado |
| Answer to specific info request 4:  Se rellena mediante bombeo y tubería homologada que lleva su propio cubeto de retención para evitar y recoger perdidas en caso de que se produzcan Se dispone de carros de actuacion |
| Answer to specific info request 6:  A dia de hoy no tenemos alternativa técnica que sustituya este fluido dando las mismas prestaciones de características físico- quimicas. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3701 | Date:  2022/12/19 14:48  Content:  Hazard or exposure  Environmental emissions  Information on alternatives  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Italy  Company name confidential:  Yes | General Comments:  In our opinion terphenyl hydrogenated for heating closed systems should be exempted from authorization. The relevant area of risk is already regulated via worker safety regulations. The use of HTF for scientific research and development should be exempted from authorization. |
| Answer to specific info request 1:  In our case, hydrogenated terphenyl is used as a heat transfer fluid (HTF) in a closed system that does not come into contact in any way with the final product and operators. The closed system is well equipped with emergency control systems like expansion vessels which continuously control the oil level, containment basins as a preventive and precautionary measure for any spills, vent system with periodic emission control. Oil degradation is then annually monitored. Our plants are also provided with general leak collection systems, containment devices installed under flanges and pumps, retention systems in pumps and valves to ensure that any hydrogenated, terphenyl leakage through seals is safely drained and collected in a contained space, level monitoring of terphenyl, hydrogenated. |
| Answer to specific info request 2:  Directive 2014/68/EU - the Pressure Equipment Directive (PED) - is to be taken into account for heat transfer systems containing hydrogenated terphenyl and as such, already name the requirements for these systems in terms of safety. |
| Answer to specific info request 3:  Ref. answear 1. No data available for costs of installing and operating |
| Answer to specific info request 4:  Terphenyl, hydrogenated resists at very high temperature and we have no information on the release of low-boiling and high boiling degradation products which in any case remain confined in the closed circuit. The risk of release into the environment is strictly limited, such as for example in cases of replacement or topping up of fluids, carried out directly from the Terphenyl, hydrogenated tank in the plant tanks in a closed and well controlled system. In the event of accidental spills or when the plants are decommissioned at the end of their life, preventive measures are taken as mentioned in answer 1. The disposal of this product, solutions and any by-products is carried out always following the indications of the law on environmental protection and waste disposal and the requirements of each relevant local authority. |
| Answer to specific info request 6:  The use as a heat transfer fluid with high thermal stability guarantees a long-life cycle, of over ten years, with periodic annual checks on the state of degradation of the HTF and any topping up with new material. Moreover, being thermally more stable than the alternatives for HTF, it is disadvantageous to consider the use of less stable alternatives subjected to a shorter shelf life, higher vapour pressure and therefore a higher potential safety risks. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3702 | Date:  2022/12/19 15:45  Content:  Scope or restriction option analysis  Environmental emissions  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Austria  Company name confidential:  Yes | Answer to specific info request 1:  Betriebssicherheit, Öl wird immer überprüft |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3703 | Date:  2022/12/19 16:12  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Germany  Company name confidential:  Yes | Answer to specific info request 1:  We would recommend providing information on measures you have in place at your sites. |
| Answer to specific info request 2:  We can provide information and recommendations of our products to eliminate environmentally hazardous exposure. |
| Answer to specific info request 3:  We recommend that you provide information on the technical protection measures and possible solutions you apply to prevent unacceptable emissions to the environment, as well as an overview of the general technical protection measures and product designs (e.g. training and inspections). |
| Answer to specific info request 4:  § How are releases to the environment avoided when e.g. fluids are replaced or topped-up, when accidental spills occur or when installations are decommissioned at the end of service life. § Recommendation: Please provide information on the measures in place in order to prevent spills and releases in the environment (spill prevention plan). § Do you have robust, representative information on the likelihood and severity of accidental releases of terphenyl, hydrogenated including accidental spills, disposals, decommissioned installations? § Recommendation: We would recommend to provide a short assessment on likelihood of spills. § Could you provide information on how wastes are managed from heat transfer systems, including replaced PHT?” § Recommendation: We would recommend you explain that all wastes, including PHT is managed by certified waste management companies and spent PHT is being destroyed in energy recovery plants (WTE). |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3704 | Date:  2022/12/19 16:13  Content:  Hazard or exposure  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Switzerland  Company name confidential:  Yes  Attachment:  <redacted>  Privacy statement:  justification: analytical data | Answer to specific info request 1:  Operating Conditions: Max 335 °C, 6 bar Pipes welded wherever possible. Containment areas sealed with concrete for Pumps und regulating valves, as well as storage tanks. Emergency emptying of system through separate pipes. |
| Answer to specific info request 3:  Pipes welded wherever possible. Containment areas sealed with concrete for Pumps und regulating valves, as well as storage tanks. Emergency emptying of system through separate pipes. |
| Answer to specific info request 4:  Our System has a heating (335 °C) and a cooling branch (below 100 °C). Both branches are connected. The low boiling products are removed from the cooling branch. In this way the evaporation during removal is kept to a minimum due to the lower temperature at release. The removed substances are filled directly into oil barrels and disposed accordingly. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3705 | Date:  2022/12/19 16:44  Content:  Environmental emissions  Information on alternatives  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Netherlands  Company name confidential:  Yes  Attachment:  <redacted> | Answer to specific info request 1:  This is a second round of information we are providing, just focusing on the questions that ECHA-S posed to the LR. We had previously responded to other questions. |
| Answer to specific info request 3:  See uploaded word document |
| Answer to specific info request 5:  In a qualitative sense, CSP growth may suffer in case PHT would no longer be allowed in these systems |
| Answer to specific info request 6:  The targeted temperature range for PHT and its 2 alternatives in non-pressurized systems is 300 - 350 C. In order to use biphenyl a retrofit of the plant may be required to use a pressurized system, at very high cost |
| Answer to specific info request 7:  See attached word document |
| Answer to specific info request 11:  The plant would need to close as the economics would be desastrous |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3706 | Date:  2022/12/19 17:13  Content:  Information on alternatives  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  Industria Cementi Giovanni Rossi SpA  Org. country:  Italy | Answer to specific info request 6:  The use of Mineral Oils at our operating conditions can produce LB and HB in greater quantities increasing the risk of pump cavitations, decreasing of heat transfer coefficient and frequency of maintenance. Mineral oils are paraffinic-based and the LB could contain volatile and inflammable products, the HB can instead crate sludges difficult to remove, due to the polymerization of paraffin radicals. On top of that, pumping system should be re-checked since physical properties are different, potentially to be replaced with a great impact on CAPEX. Silicon fluids can create silicon-based byproducts which may precipitate or increase the fouling. Also for such case, the pumping system needs to be re-checked to understand the suitability for this kind of fluids, potentially to be replaced with a great impact on CAPEX. For Biphenyl, the vapor pressure may be different creating the need to operate at higher pressure, so pumping system needs to be re-checked and potentially replaced with a great impact on CAPEX. For all alternatives mentioned, the heat transfer coefficient will be potentially impacted also, creating bottlenecks impacting on final production rates. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3707 | Date:  2022/12/19 18:43  Content:  Scope or restriction option analysis  Environmental emissions  Baseline  Information on alternatives  Other socio economic analysis (SEA) issues  Transitional period  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Industry or trade association  Org. name:  Aerospace, Security and Defence Industries Association of Europe (ASD)  Org. country:  Belgium  Attachment:    <redacted> | General Comments:  The ASD-AIA follow-up submission (following ECHA’s follow-up questions to ASD-AIA initial response) is entered as an attachment through Section IV. |
| Answer to specific info request 7:  The ASD-AIA follow-up submission (following ECHA’s follow-up questions to ASD-AIA initial response) is entered as an attachment through Section IV. |
| Answer to specific info request 8:  The ASD-AIA follow-up submission (following ECHA’s follow-up questions to ASD-AIA initial response) is entered as an attachment through Section IV. |
| Dossier submitter response:  A reply to these comments was given in the section on “Uses in Aviation and Defence” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Uses in Aviation and Defence” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Uses in Aviation and Defence” of the general response to comments. |

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| 3709 | Date:  2022/12/19 21:04  Content:  Scope or restriction option analysis  Hazard or exposure  Environmental emissions  Information on alternatives  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Italy  Company name confidential:  Yes | General Comments:  Terphenyl hydrogenated is used in a closed system as HTF. The operations are performed under strictly controlled conditions. Taking into account the requirements of the plant and processes (principally temperature and pressure) and the related costs (alternative heating systems), no alternatives are suitable and environmentally sustainable. |
| Answer to specific info request 1:  Terphenyl hydrogenated is transferred from the drums into the heating system by a pump with a mechanical double seal. All the equipment and vessels are provided with a containment tank. |
| Answer to specific info request 2:  The plant and the pipelines are designed according to the PED, where and if applicable. The double channel piping are designed and installed in a workmanlike way. The equipment is controlled according to the internal procedure TV PGAC (management and control of the critical equipment CE) that responds to the national law and requirements. The procedure describes the monitoring plan of the CE and the operative instructions to be followed in case of NC (during the standard working hours and during the nights or weekends), in order to guarantee the continuity of CE, including the equipment back-up. To avoid possible emissions, the equipment is designed and installed with a containment tool. |
| Answer to specific info request 3:  The plant areas are constructed with a containing basin. The safety valves are equipped with a recirculation line in case of opening, the pumps are equipped with doubled seals and a cointment tank, gaskets are made of reinforced graphite, doubled chambered lines labelled as hazard fluid, red coloured shutoff valves. |
| Answer to specific info request 4:  It is foreseen the top-up and the refill according to analysis of the HTF performed by an external laboratory. The sampling is performed under s.c.c. The releases to the environment are avoided thanks to the containment tools and the operative instructions reported in the manual of the utilities. Eventual accidentals spills are immediately registered by the HSE manager, and managed by the plant operators according to the internal procedure (spills are drained from the cointainment tool to the drum and then disposed according to the SDS and national law). |
| Answer to specific info request 6:  Only with terphenyl hydrogenated is possible to operate at 350°C, 8 bar. These operative conditions are fundamentals for the processes in place in the Fine Chemical Area. The lines and related equipment is under revamping. No alternatives are suitable and sustainable from a technological point of view and also from the environmental and economic ones. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3710 | Date:  2022/12/19 21:09  Content:  Scope or restriction option analysis  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Lithuania  Company name confidential:  Yes | General Comments:  PHT is essential in our uses because of it’s special properties -thermal stability and long service life. PHT is used in our site from 2005 Y and we are going to run for next 20-30 years without significant changes. It is important to notice that our target is to reduce greenhouse emissions and our investments are needed for the transformation from heat production using natural gas to heat production using biofuel. Impact of biofuel heaters to heat transfer fluid more destructive comparing with natural gas heaters, therefore heat transfer fluid with especially high thermostability and resistance is needed in our process. |
| Answer to specific info request 1:  PHT is used in our site from 2005 Y. We have robust and representative data on Operational conditions. Risk analysis of potential hazards and emergencies of UAB "NEO GROUP" PET pellet plant was is performed. |
| Answer to specific info request 2:  Heat transfer system as a dangerous device is in the focus of the Technical supervision service. Technical supervision service are inspecting of the technical condition of potentially hazardous equipment, conformity assessment of equipment. |
| Answer to specific info request 3:  All manufactoring teritory is equipped with general leakage collection system, containment devices installed beneath flanges and pumps, retention systems in pumps and valves to ensure that any leakage of terphenyl, hydrogenated through the seals is safely drained off and collected in a contained space, terphenyl, hydrogenated level monitoring. PHT is used in closed system in our industrial site and does not imply any risks to the environment, workers, inhabitants– there is no emissions to atmosphere (only emission from collection vessel breather -0.0687 T/Year), no effluents to water or other environment components. All HTF system is under control 24/7 – Distributed control system (DCS) is used for process monitoring. Monitoring of chemical condition of PHT is performed every year. There is no impact to environment or human health during normal operating conditions. |
| Answer to specific info request 4:  Samples of HTF are provided to external laboratories for analysis of concentration of degraded compounds. Non suitable fluids are collected in tanks and submited to hazardous waste handlers. The site area is covered with an waterproof surface with fitted shut-off valve – any accidental spills would be collected within the site and not released into the environment. |
| Answer to specific info request 5:  It is important to notice that our target is to reduce greenhouse emissions and our investments are needed for the transformation from heat production using natural gas to heat production using biofuel. Impact of biofuel heaters to heat transfer fluid more destructive comparing with natural gas heaters, therefore heat transfer fluid with especially high thermostability and resistance is needed in our process. |
| Answer to specific info request 6:  Other alternatives were analyzed and compared. High thermal stability and long service life of PHT makes it essential. |
| Answer to specific info request 7:  PHT circulates in closed heat transfer system and not present in finished articles. Overall cost of substitution would be about 9 million EUR. This includes cost of alternative HTF, downtime of production, utilization of wastes. Expenses cannot be passed on to customers – we manufacturing commodity product and it is sold at market price, so all additional costs remains with us. EU PET (polyethylene terephthalate) market- 3,5 million tons (2019 Y), including 1 million tons from third countries. Imported product from third countries will not be covered by these requirements and therefore importers to EU will get an advantage in the competitive struggle. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3711 | Date:  2022/12/19 23:51  Type:  BehalfOfAnOrganisation  Org. type:  Industry or trade association  Org. name:  The Association of Lithuanian chemical industry enterprises  Org. country:  Lithuania | Answer to specific info request 1:  Yes. |
| Answer to specific info request 2:  Production equipment, including the heating system in which TFH circulates, is classified as dangerous equipment and is constantly under the control of the Technical Supervision Service (Techninės proežiūros tarnyba). This includes RMM as well. |
| Answer to specific info request 3:  The entire territory of the factory is covered with an impermeable coating, the wastes are collected in the separate special tank is separated by a wall. The equipment and systems - general leakage collection systems, containment devices installed beneath flanges and pumps, retention systems in pumps and valves to ensure that any leakage of terphenyl, hydrogenated through the seals is safely drained off and collected in a contained space, terphenyl, hydrogenated level monitoring are in place. |
| Answer to specific info request 4:  After collecting the waste, it is handed over to the waste manager (external). A risk analysis of the releases of the HTF is carried out. |
| Answer to specific info request 5:  In this case, the relationship between the use of HTF and renewable energy sources was not examined, although the company also uses biofuel (a renewable energy source). |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3712 | Date:  2022/12/20 08:44  Content:  Information on alternatives  Type:  MemberState  Country:  Finland  Attachment:  <redacted> | General Comments:  FI CA agrees with the dossier submitter that only the substance EC 400-370-7 can be considered as potential alternative to Terphenyl, hydrogenated (PHT) in high temperature, non-pressurised heat transfer systems. In high temperature, non-pressurised conditions substitutes need to have a similar high boiling point at standard atmospheric pressure (101.325 kPa) as PHT to be used without excessive thermal degradation in liquid phase at high temperature ranges of 300-350 °C. FI CA concluded in RMOA of alternative heat transfer fluids to PHT (https://echa.europa.eu/documents/10162/2248ee6d-9304-4e2b-677b-9d2782f8afc4) that there are only two substances that can be used in the required upper operating temperature of 325-350 °C in non-pressurised heat transfer applications. Further assessment of alternatives of PHT can be found in confidential RMOA annexed to this comment. The other alternative in RMOA is (Dibenzylbenzene, ar-methyl derivative, EC 258-649-2). Based on the self-classification as Repr. 1B and the registrant’s own conclusion in the registration dossier that the substance is PBT/vPvB, FI CA agrees with the dossier submitter that EC 258-649-2 is no longer a viable alternative to PHT.  FI CA highlights that other substances can potentially be used as alternative to PHT in low temperature (under 300- 325 °C), non-pressurised heat transfer systems. However, these alternatives have not been assessed in above mentioned FI RMOA as they cannot be considered as direct alternatives in high temperature, non-pressurised heat transfer systems, in which PHT is used.  FI CA also notes that the alternative substance EC 400-370-7 is currently under substance evaluation (CoRAP 2022) by Finland for potential PBT/vPvB properties. |
| Dossier submitter response:  A reply to these comments was given in the sections on “Use as Heat Transfer Fluid”, “Uses in Aviation and Defence”, and “Use as a Plasticiser in non-aviation uses” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Uses in Aviation and Defence” and “Use as a Plasticiser in non-aviation uses” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Uses in Aviation and Defence” and “Use as a Plasticiser in non-aviation uses” of the general response to comments. |

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| 3713 | Date:  2022/12/20 08:58  Content:  Information on alternatives  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Estonia  Company name confidential:  Yes | General Comments:  Terphenyl, hydrogenated was selected for our use as HTF due to its stability in the given conditions. All other possible HTFs have much shorter life span and would require frequent replacement while hydrogenated terphenyl have been used for several years without siginificant losses. |
| Answer to specific info request 1:  All activities of our company, including the heat transfer systems, are subject to Estonian and EU legislation, and are regularly checked by authorities. Authorities have issued us Integrated Environmental Permit that includes the use of hydrogenated terphenyl. This is based on fact that all necessary technical and organizational measures for prevention of emissions have been implemented. Our company have also compiled and presented Safety Report as required by legislation. This report has been approved by the authorities. |
| Answer to specific info request 2:  It is specifically stated in project documents of the heat transfer system that its design corresponds to the requrements of the Pressure Equipment Directive. |
| Answer to specific info request 3:  All above mentioned technical measures are already in place in our production system, including the heat transfer system. |
| Answer to specific info request 4:  Hydrogenated terphenyl have been very stable in our heat transfer system. The system is airtight but small leaks through joints and seals can occur. These leaks are contained by the specific measures. Due to these leaks some top-up is periodically done. Existing amounts of liquid waste of hydrogenated terphenyl are treated in our own process which main raw materials contain large amount of polycyclic aromatic hydrocarbons. Wiping waste is collected into special containers and treated by licenced waste management company. |
| Answer to specific info request 6:  For our process of thermal polymerization all other existing heat transfer fluids were not suitable due to low stability at required temperatures. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3715 | Date:  2022/12/20 13:12  Content:  Hazard or exposure  Environmental emissions  Type:  BehalfOfAnOrganisation  Org. type:  Industry or trade association  Org. name:  <redacted>  Org. country:  Netherlands  Company name confidential:  Yes | Answer to specific info request 1:  terphenyl, hydrogenated is used in fully closed system. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3716 | Date:  2022/12/20 14:29  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Greece  Company name confidential:  Yes | Answer to specific info request 1:  Automatic Leakage detection and isolation of the HTF in underground tanks. |
| Answer to specific info request 2:  The complies with the Directive 2014/68/EU - the Pressure Equipment Directive (PED) |
| Answer to specific info request 3:  Automatic leakage detection and collection of the leaked HTF in underground tanks. The system is certified by TUV. |
| Answer to specific info request 4:  In case is needed, specialized company will handle the spill out. The waste HTF oil is managed by specialized company as well. |
| Answer to specific info request 6:  Alternative fluids are not recommended by the contractor for the specific use in our plant. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3717 | Date:  2022/12/20 14:44  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Greece  Company name confidential:  Yes | Answer to specific info request 1:  The unit operates as a close hot oil circuit, there is no possible leak on the external enviroment. |
| Answer to specific info request 3:  Continues training of personnel on safety issues. |
| Answer to specific info request 4:  In case of leak, isolation of hot oil take place on its main vessel. There is a certified waste management company to collect them. |
| Answer to specific info request 6:  Due to thermal capacity of the fluid that suits to our operation. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |

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| 3719 | Date:  2022/12/20 16:18  Type:  MemberState  Country:  Sweden  Attachment: | General Comments:  Please, see attachement |
| Dossier submitter response:  A reply to these comments was given in the section on “Miscellaneous” of the general response to comments. |
| RAC Rapporteurs comments:  RAC’s reaction to the Dossier Submitter’s response as well as RAC’s view on the comment are discussed in general under the section on “Miscellaneous” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Miscellaneous” of the general response to comments. |

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| 3720 | Date:  2022/12/20 18:58  Content:  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Italy  Company name confidential:  Yes | General Comments:  We agree with the EU Restriction process proposal for Terphenyl hydrogenated (PHT) because we believe it is the most proportionate and effective regulatory approach for the managing of the environmental emission in a controlled way.  Our use of PHT is as a heat transfer fluid (HTF): we welcome the derogation proposal for this kind of use and, as chemical industry, we can confirm that there are no risk for environmental or human exposure. In particular, PHT is used in a closed system and needs a minimum periodical make-up. The handling of HTF is required only after maintenance activities when a limited amount of oil is disposed. In this cases a make-up of HTF is performed from drums by means of dedicated pumps, granting the lowest operator exposure. Furthermore, the data of environmental measurements carried out over the years show that also the dispersion of oil mists in the work environment is negligible thanks to the sealing systems installed.  We would put in evidence also the socio-economical consequences of an eventual unavailability of Terphenil hydrogenated as HTF for our company, in the case the derogation for the use would be not permitted. First of all, there would be the needing to shutdown 2 production plants and to move one of our substance production in another plant. Wheteher this activity should be carried out during the plant general maintenance shutdown (which have a three-year frequency) the cost would be approx. 1,000 k€, only for the purchase of 190 tons of new oil needed for our three plants involved. Some additional costs are furthermore foreseeable for cleaning operations, before the loading of a different HTF. In case the sunset date would not compatible with planned shutdown, that would result in an additional plant stop, meaning the shut-down of other production sections in 3 plants. The time needed to restore production af all plants would be approximately 15 days and the the relative cost would be approx 19,000 k€. |
| Answer to specific info request 1:  In our productive plants, PHT is used in closed circuit and in controlled conditions, therefore no relevant additional technical measures are necessary becuase those in plase are already the most restrictive one. |
| Answer to specific info request 2:  During design, construction, and operation of our HTF systems in our plants, we have taken into account and applied the Pressure Equipment Directive 2014/68/EU. |
| Answer to specific info request 3:  In order to adequately contol the environmental emission of PHT in HTF use, we already put in place the following measures: a. using of collection vessel where necessary b. performing of leakage test of joints after maintenance operations c. using of nitrogen as protection of the HTF against oxidation, in hight temperature tanks d. periodical evaluation of the fluid quality (approximately every 6 months) e. using of pumps with mechanical seals or magnetic driven pumps f. periodical inspections from competent technical bodies g. control programs for potential leackeges (LDAR) h. monitoring of fluid level i. drain, fill and top-up are performed in close circuit systems. |
| Answer to specific info request 4:  The top-up refill is required only after maintenance activities when a limited amount of oil is disposed. We have an average disposed quantity of HTF minor than 10 tons/year over a total hold-up of 180 tons. The disposal of really small amount of PHT are required only during maintenance activities of the circulating pumps; therefore the disposal generally occurs once a year. the used PHT is packaged in IBC and, throught certified waste management companies, sent to energy recovery plants. |
| Answer to specific info request 6:  There are 2 potential alternatives to TPH in HTF, but both are not feasible from the technical point of view. Alternative 1 - Replacement of PHT as HTF by 6-(1-phenylethyl)-1,2,3,4-tetrahydronaphthalene (CAS 6196-98-1; EC 400-370-7): Technical viability:The two fluids cannot be safely mixed without chances of adverse effects occuring, both from safety and plant reliability points of view. The existing oil should be removed and disposed, the equipment should be thoroughly washed with chemicals and drained, prior to loading with the new oil. Alternative 2 - di benzyl benzene ar-methyl derivate (CAS 53585-53-8; EC 258-649-2): Technical viability: The two fluids cannot be mixed without adverse effects occurring, both from safety and plant reliability points of view; because of this the existing oil should be removed and disposed as waste and the equipment should be thoroughly washed with chemicals and drained, prior to loading with the new oil. Unsuccessful identification of an alternative would involve stopping production plants, with very negative effects on the business. |
| Dossier submitter response:  A reply to these comments was given in the section on “Use as Heat Transfer Fluid” of the general response to comments. |
| RAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Miscellaneous” of the general response to comments. |
| SEAC Rapporteurs comments:  SEAC’s reaction to the Dossier Submitter’s response as well as SEAC’s view on the comment are discussed in general under the section on “Use as Heat Transfer Fluid” of the general response to comments. |