INTERNATIONAL UNION OF WAGON KEEPERS

UIP POSITION PAPER

14.07.2023

UIP Position on PFAS restriction during ECHA consultation

UIP - who are we representing?

Founded in 1950, the UIP – International Union of Wagon Keepers, is the umbrella association of national associations from fourteen European countries, thus representing more than 250 private freight wagon leasing companies and Entities in Charge of Maintenance (ECM), performing 50 % of the rail freight tonne-Kilometres throughout Europe. We are therefore representing down-stream users of PFAS when it comes to workshops maintaining and manufacturing freight wagons and tank wagons as well as end- consumers of PFAS when it comes to the companies leasing the freight/tank wagons. Our fleet counts around 234'000 freight wagons, of which around 82'477 are tank wagons, the majority are approved for the transport of dangerous goods. UIP members own most of the tank wagons operating in the EU market and are leasing them to shippers and railway undertakings who are operating them. Nevertheless, wagon leasing companies are also responsible to maintain the wagons (every 6 years) as well as the tanks in intervals of 4 and 8 years.

Where is PFAS used?

PFAS is used as sealing applications and sometimes as coating in tank wagons essential for the transportation of dangerous goods

Sealing elements are components within the metallic valves and equipment that are fitted to the tank operational openings and are crucial to the containment of the cargo of liquids and liquefied gases, most of which are regulated as dangerous goods (RID). But other substances are transported too, including food grade and non-regulated substances. Tank wagons are relatively standardized (see EN 12561 1-8) and are suitable for a range of cargo and approved by competent national authorities using a coding system described in RID – the International Agreement for the Carriage of Dangerous Goods.

The main sealing materials are PTFE, FEP and PFA in solid form but as well as PFA envelope on an elastomer core. Seals and O-rings are of PTFE, FEP, PFA and fitted within the body of the valve and access hatch. Sealing elements can be found in the bottom valve assembly in the airline assembly and in the access hatch seals. For more information, please consult the ITCO IG09 Case study. In very few tank wagons, PFAS is also used to coat tanks from within for the transportation of certain types of acids.

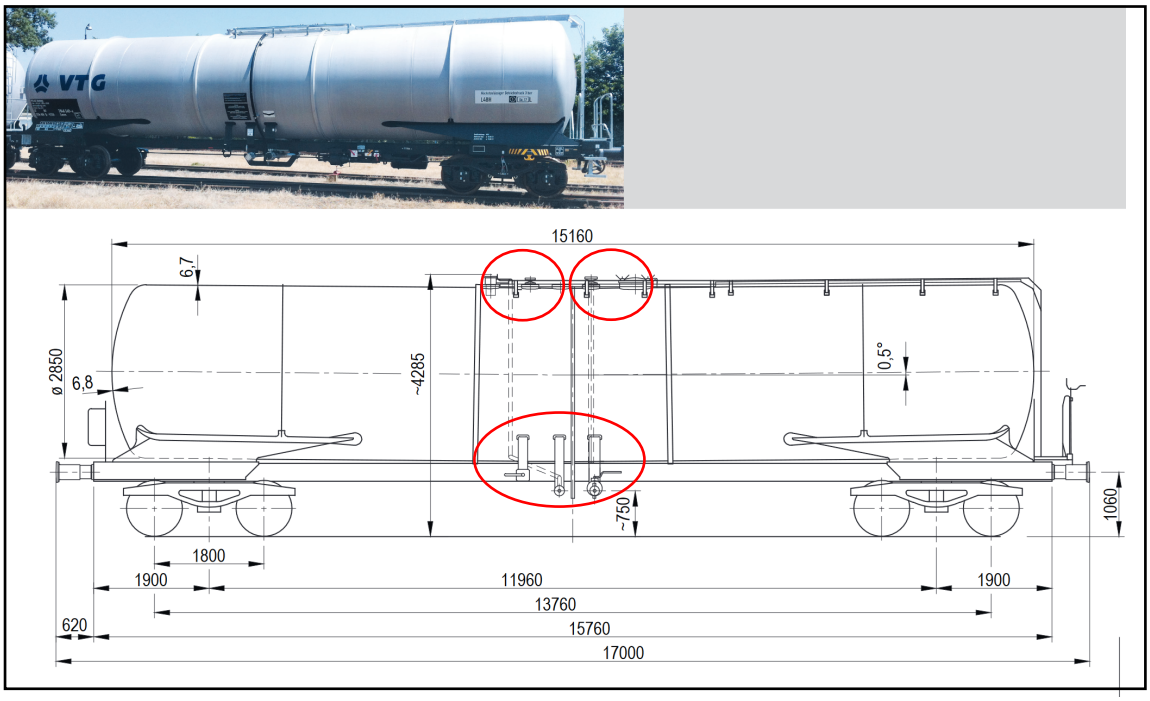

Image 1: example of a chemical tank wagon and their sealing assemblies with PFAS (highlighted in red)[1]

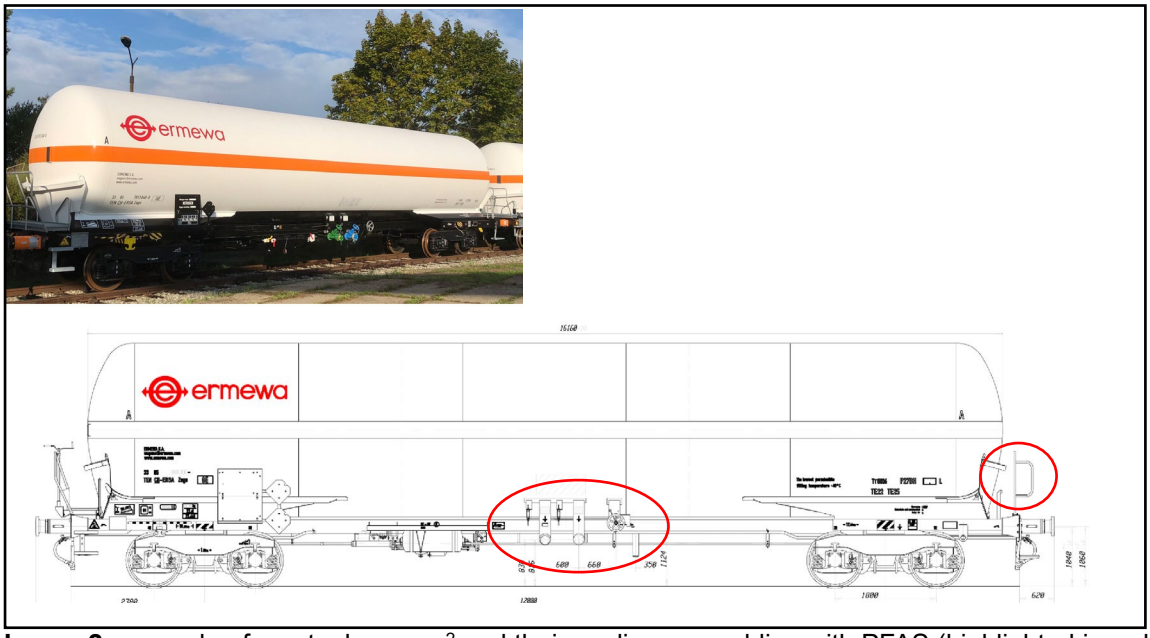

Image 2: example of gas tank wagon[2] and their sealing assemblies with PFAS (highlighted in red).

[1] https://www.vtg.com/hiring/our-fleet/c60092d

[2] https://www.ermewa.com/en/wagons/zags-113m3-2/

Why is PFAS indispensable in sealings of tank wagons?

Sealing elements of tank wagons are made of PFAS because of their high thermal and chemical resistance[3] and the fact that they have very low surface tension and are thus water and oil repellent as well as abrasion and wear resistant at the same time. There are up to date no alternatives that can offer the required chemical and thermal resistance combination. According to the chemical resistance chart[4] PTFE is the most performing plastic against dangerous goods and allow the safe transportation of these goods across the whole EU.

Table 1: Chemical Resistance of High Performance Polymers.[5]

Chemcial compound	PTFE	PVDF	PSU	PPSU	PPS	PPA	LCP	PEEK	PI	PAI	PBI	PEI
Acid, diluted	+	+	(+)	(+)	+	(+)	+	+	(±)	+	±	+
Acid, concentrated	+	+	±	±	+	(+)	(+)	(+)	(±)	+	-	+
Bases, diluted	+	+	+	+	+	+	+	+	-	±	±	+
Bases, concentrated	+	±	(+)	(+)	(+)	+	(+)	+	-	-	-	-
Hydrocarbons, aromatic	+	(+)	-	(±)	+	+	+	+	+	+	+	-
Hydrocarbons, aliphatic	+	(+)	+	+	+	+	+	+	+	+	+	+
Esters and Ketones	+	+	-	-	+	(+)	+	+	+	+	+	(±)
Ethers	+	+	±	±	+	(+)	+	+	+	+	+	+
Solvents, chloride based	+	+	±	-	±	+	+	+	+	+	+	(±)
Alcohols	+	+	±	±	+	+	+	+	±	+	+	+
+: resistant; (+): partially resistant; ±: conditionally resistant; (±): partially not resistant; -: not resistant												

Table 2: Temperature resistance of PFAS material

Symbol	Material name	Working temp. [°C]	Temporary temp. [°C]
PTFE	Polytetrafluoroethylene	260	290
PEEK	Polyetherketone	250	310
PVDF	Polyvinylidene fluoride	150	150
PEI	Polyetherimide	170	210
PPS	Polyphenylene sulfide	240	270
PFA	Perfluoroalkoxy polymer	150	240
PSU	Polysulfone	150	180

[6]

To sum up: PFAS is used because of its following characteristics:

- **Chemical resistance and compatibility:** tank wagons transport a wide range of chemicals and the material must not absorb the product it transports
- **Thermal stability:** valves are manufactured to meet the required temperature range of -40 °C to +200 °C and need to withstand pressure up to 6 bar.
- **Durable:** sealings must be capable of withstanding a degree of handling damage and should not absorb the substances transported
- **Shrinkage, elastic recovery, vibration and friction resistance:** sealing elements need to remain leak tight during long-distance transportation

PFA material is essential for sealings at the tank wagon itself and its equipment e.g. valves. The main sealing materials are PTFE, FEP and PFA in solid form but as well as PFA envelope on an elastomer core. It is

[3] European Sealing Association (ESA) position paper: https://www.esaknowledgebase.com/wp-content/uploads/2022/03/ESA-Position-Statement-on-proposed-PFAS-regulation-March-2022-1.pdf (p.4), https://www.esaknowledgebase.com/wp-content/uploads/2023/06/ECHA-Submission-Final-.pdf

[4] https://www.curbellplastics.com/wp-content/uploads/2023/03/Chemical_Resistance-Chart_curb.pdf

[5] https://www.esaknowledgebase.com/wp-content/uploads/2022/03/ESA-Position-Statement-on-proposed-PFAS-regulation-March-2022-1.pdf

[6] https://www.esaknowledgebase.com/wp-content/uploads/2022/03/ESA-Position-Statement-on-proposed-PFAS-regulation-March-2022-1.pdf

estimated that the materials used for tanks wagons are an average of 82% non PFAS and 18% PFAS (see ITCO study). UIP estimates that up to 8'500 kg of PFAS material is used per annum for sealing elements on tanks of rail tank wagons in Europe.[7]

How much PFAS is emitted in our sector?

Based on the ITCO study, sealing elements use PFAS components in the solid form, primarily PTFE but similar materials too e.g., FEP, PFA, FFKM, FKM. The solid materials form does not allow for the materials to shred or degrade to particles as is the case with some other industries such as food packaging, clothing, and fire-fighting foams. Furthermore, the sealing element is incorporated into the tank and cannot get out into the environment. Mainly during the mandatory RID maintenance check, sealings are replaced at least every 8 years (full check-up), or even earlier if needed during the intermediate check-up after 4 years.

As regards the end of the life-cycle phase, maintenance facilities dispose the sealing materials as industrial waste since there is no recycling requirement. The percentage that is disposed of in landfill or municipal incineration is unknown. Given that sealing elements are solid materials and also given their persistency, they could be separated by our workshops for disposal of approved facilities if required. UIP would support rules on recycling and waste management of PFAS materials.

Are there alternatives to PFAS in sealings?

To the best of our knowledge and this is as well supported by the European Sealing Manufacturers and the ITCO study, there are currently no alternative materials that would perform as well as existing solid PFAS sealings as required for chemical, thermal, plasma and radioactive resistance for seals. Less performing alternatives would significantly increase the risk of leakages and therefore pose a threat to the environment and also to human health due to the more frequent replacements of sealings and risk of contamination as well as leaks.

However, if an alternative was to be developed it does not necessarily mean that they can substitute easily the PFAS sealing with the current valves. Most likely an alternative (if then available) means also a change in the valve design which requires approval of the valves and in some cases even the re-approval of the tanks by the competent authorities. If a PFAS alternative would become available UIP would recommend a transition time of 5 years for newly built tank wagons to provide the manufacturer with the relevant time to get the new tank wagons reapproved and to cover the time from ordering a tank to its delivery and then approval by the European Railway Agency.

As for the existing tank wagon fleet, given its size (82'477 tank wagons) and their long-life cycle of 30 – 40 years and the fact that they must be revised on average every 4 – 8 years), UIP would request that they are exempted based on grandfather right entitlements. Changing the valves of each tank wagon could cost up to 10'000€ per tank wagon and would lead to the reapproval of each tank wagon, adding to administrative burden without any added value.

[7] [Explanation of calculation: We assume that a tank wagons has around 0.5 kg of PFAS per wagon which needs to be replaced every 6 years (average of the mandatory periodic revision time of 4 and 8 years for tank wagons) of the current tank wagon fleet of 82'477, 0.5 kg x 82'477/ 6= 6'873 kg) + (sealings in new built per year: 3'000 new tank wagons x 0.5 kg= 1'500 kg]

Impact of a PFAS ban

Risk to environment and human health

Safety is the prime consideration for tank wagons, especially since they are transporting a wide range of classified dangerous goods in liquid and gas form. Containment of these substances requires tank operational opening to be fitted with highly engineered valves, ancillaries, and access hatches, each requiring sealing elements between the metallic interfaces of the tank and valve.

Since there are no real alternatives to PFAS for sealing applications that would provide the crucial performance range achieved by existing solid PFAS, a blanket ban of PFAS would mean a significant higher risk of leakages of dangerous goods into the environment. It would also mean higher emissions of toxic and dangerous products because before a sealing can be replaced, the tank needs to be cleaned from the product. Less performing alternative would also bring a much higher risk to human health, especially those working in workshops that would need to work with possible contaminated sealings and it means a higher exposure to dangerous goods during the activity of replacing the sealings.

Socio-Economic impact

A ban of PFAS for sealings used in tank wagons approved for the transport of dangerous goods would severely disrupt the global chemical and liquefied gas transportation supply chain. Some products could not even be transported any longer, implying a possible shortage of products of basic needs. Given that around 212 million tons/km of dangerous goods are transported alone by rail (see Eurostat link in annex) on a yearly basis, the effects would be catastrophic for the chemical industry, all related industries that depend on chemical supplies and hence the whole European economy. Since decades, rail freight has been the backbone of the chemical supply chain as certain products are forbidden to be transported on roads and road transport cannot offer the necessary capacity for the high volumes of chemicals and gas transports. Furthermore, a ban of PFAS, leading to the impossibility of using tank wagons, would undermine the European Green Deal and its objective to reduce CO2 emissions in transport by increasing rail freight's market share. As alternatives for PFAS used in sealing do not exist, around 250 Wagon leasing companies and their assets will be affected, most of them SMEs. Furthermore, over 80 workshops dealing with tank wagons maintenance and repairing will be affected as user of PFAS.

We need a derogation for PFAS used in tank wagons

UIP is committed to the objectives of REACH which are to protect human health and the environment while guaranteeing the free movement of dangerous goods and freight in the internal market. UIP is supporting the attempt to limit the use of PFAS in non-essential consumer facing products. However, the use of PFAS in tank wagons needs to be exempted from the ban, provided of course that extra safety measures to limit emission during the manufacturing phase and end of life cycle phase is ensured.

To sum up, given that:

- there are no known health concerns of solid PFAS
- there are no emissions during the use phase and that emissions during end of life phase can be avoided
- there are no equivalent alternatives on the market for the sealings of tank wagons
- any other less performing material used in sealings will have significant negative environmental and human health implications
- a ban would have significant impact on the global chemical supply chain and the whole EU economy

UIP therefore considers that an exemption (or unlimited time derogation) for PFAS used in tank wagons would be needed. We could also support the inclusion of a review clause after 15 years to reexamine if appropriate alternatives are available on the market.

If a PFAS alternative became available UIP would recommend a transition time of 5 years for newly built tank wagons. For the existing tank wagon fleet UIP would request that they are exempted based on grandfather right entitlements.