



Reference:

O. Reiff-Musgrove, *Introduction to the ESA REACH Tool*, 4<sup>th</sup> ESA REACH Workshop, ESA HQ Daumesnil, Paris, 18<sup>th</sup> October 2022

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# Introduction to the ESA REACH Tool

A Digital Materials Obsolescence Management Tool

**Oliver Reiff-Musgrove – Regulatory Consultant, REACHLaw**

18<sup>th</sup> October 2022 | 4<sup>th</sup> ESA REACH Workshop | ESA HQ Daumesnil, Paris

# Introduction to the ESA REACH Tool

## Agenda

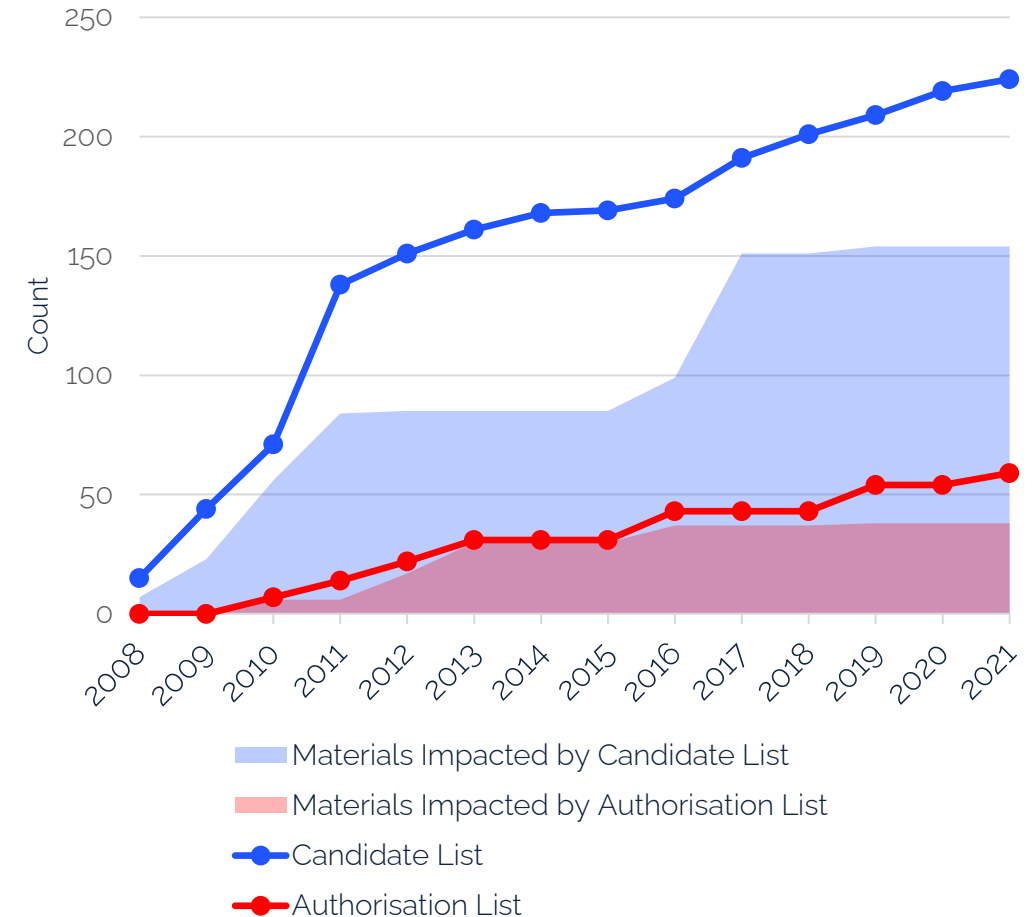
1. Background
2. Concept
3. Overview of features
4. Analysis
5. Conclusions

# Background **Obsolescence Tracking**

- Each update to a REACH substance list creates a possible risk of obsolescence.
  - **Authorisation** and **Restrictions** Lists being the highest
  - **Candidate** and CoRAP offer an insight into the future

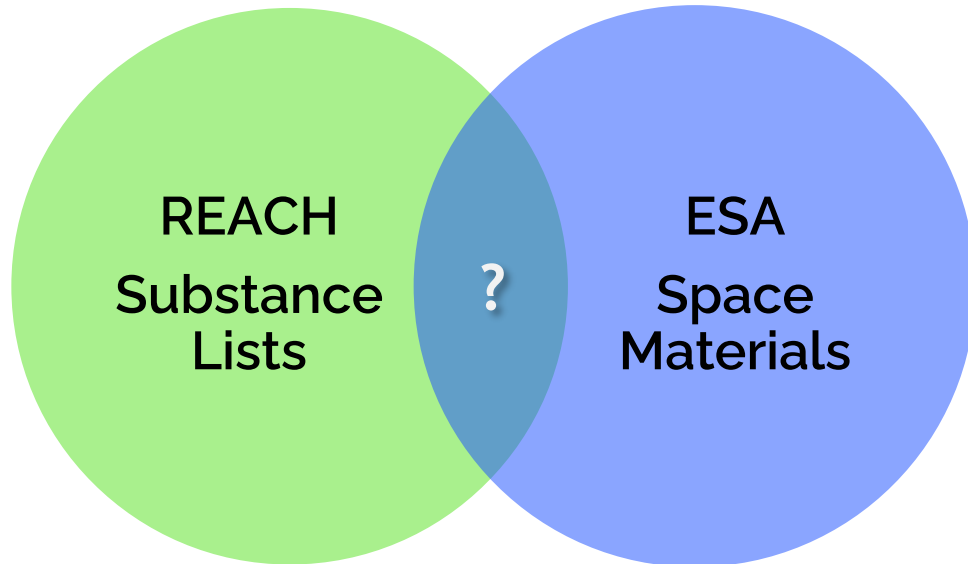
## Previously at ESA...

- **Obsolescence**
  - Little forecasting, exposure analysis performed on each update.
- **Compliance**
  - Manual work to look through Material Safety Data Sheets (SDSs) in a Declared Materials List (DML) looking for impacted substances
- Error-prone and burdensome (yet repetitive) process



*Evolution of entry count in relevant EU REACH lists and subsequent space relevant materials impact over time, based on the bill of materials in the ESA REACH Tool.*

# Background Automation



- ✓ Automate REACH substance list monitoring
- ✓ Automate REACH list impact assessment
- ✓ Automate materials obsolescence risk management

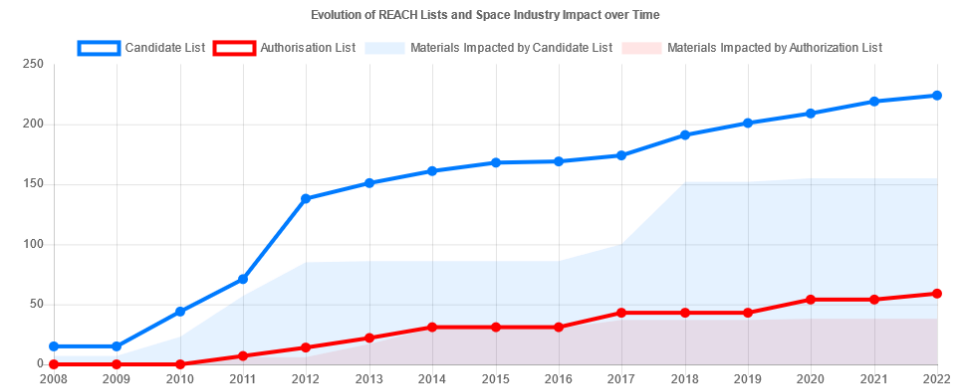
ESA REACH Tool

REACH Tool v3.5 Home About SVHCs APSS Register Login

## Welcome!

Learn about Substances of Very High Concern (SVHCs).

[Search SVHCs](#) [Search APSS](#)



Source: ECHA, ESA REACH Tool

# Background EU REACH Substance Lists

## Space-relevant EU REACH Substance Lists

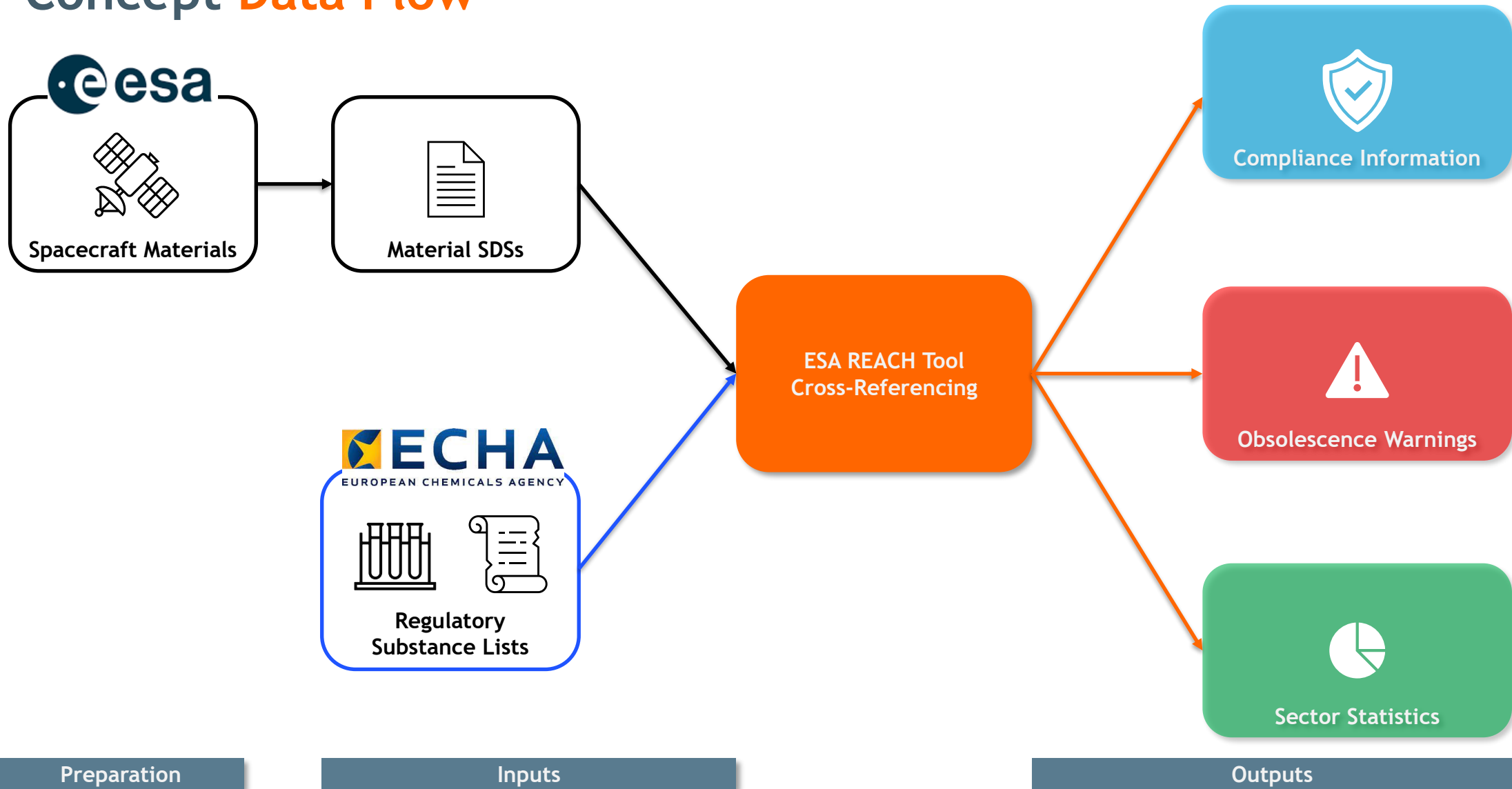
	CoRAP	Candidate List	Restriction	Authorisation
Compliance Obligations	None	Reporting duties	Restriction on certain uses	Ban without authorisation
Obsolescence Risk	Low	Medium	High* (for ban)	Very High
Update Frequency	1x/year	2x/year	No schedule	No schedule
Entries ( $\Delta$ 2022)	386	224 (+5)	71	59 (+5)

\*Restriction entry text specific

Multiple regulatory updates each year from EU REACH alone!

CoRAP = Community Rolling Action Plan

# Concept Data Flow



# Concept Cross-Referencing In Detail



*Schematic demonstrating how the ESA REACH Tool provides REACH regulatory visibility through the process of dynamic cross-referencing.*



# Concept Application

MAP PU1 Base	12	EU	03/12/2018	29/07/2022	Map Space Coatings	17/10/2018	78-93-3 108-88-3 108-88-3 90-72-2 111-55-7	✓
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Contains...

SVHC Name	CAS Numbers	Reasons	Regulatory Status
Butanone	78-93-3	Suspected Reprotoxic	CoRAP   Information requested
Toluene	108-88-3	CMR	CoRAP   Concluded <b>Restrictions List   Indirectly Space Rel. Restr.</b>

Showing 1 to 2 of 2 entries

Previous 1 Next

## What does this mean?

Production of MAP PU1 Base has a **high risk** of becoming **obsolete** due to REACH.

## Regulatory Compliance

Based on the known composition, indexed from the SDS with the above revision date, the REACH Tool has identified that MAP PU1 Base contains a SVHC.

MAP PU1 Base contains a substance found in the **Restrictions List** (REACH Annex XVII), therefore **action may be required**. Restrictions may be any condition for or prohibition of the manufacture, use or placing on the EEA market. Please consult the ECHA website for further details on the specific entry that covers the substance(s) in question, the latest EU REACH Safety Data Sheet provided by the substance/mixture supplier and – if in doubt – regulatory experts.

# Concept Application

★ ARADUR HY 905 <span>New</span>	10	EU	07/10/2022	07/10/2022	Huntsman	24/05/2018	85-44-9 85-42-7 85-43-8 2210-79-9	✓
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Contains...

SVHC Name	CAS Numbers	Reasons	Regulatory Status
Cyclohexane-1,2-dicarboxylic anhydride	85-42-7	Respiratory sensitising properties (Article 57(f) - human health)	<a href="#">Candidate List</a>   Inclusion Date: 19/12/2012

Showing 1 to 1 of 1 entries

Previous **1** Next

## What does this mean?

Production of ARADUR HY 905 has a **medium risk** of becoming **obsolete** due to REACH.

## Regulatory Compliance

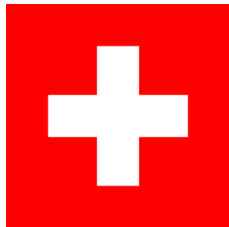
Based on the known composition, indexed from the SDS with the above revision date, the REACH Tool has identified that ARADUR HY 905 contains a SVHC.

ARADUR HY 905 contains a substance found in the **Candidate List** of Substances of Very High Concern for Authorisation\*, therefore **action may be required**. If the material (qualifying as article as such or assembly of articles) containing this substance above 0.1 % weight by weight in the article is being supplied to another entity in the EEA, the EEA supplier is required to provide a REACH Article 33 Declaration. Furthermore, as from 5 January 2021 EU suppliers of such articles/assemblies (including EU importers) are required to submit a SCIP notification based on Article 9 of the EU Waste Framework Directive in association with the applicable national law.

\*Note: In a worst-case scenario, the substance may enter the Authorisation List within about 2 years from the Candidate List inclusion date, banning its use within the EEA without authorisation after the specified sunset date.

# Overview

## Tracked Substance Lists



### Automatically Tracked Substance Lists:



- EU REACH Candidate List
- EU REACH Authorisation List (Annex XIV)
- EU REACH Restrictions List (Annex XVII)
- ECHA Community Rolling Action Plan (CoRAP)

### Other Tracked Substance Lists:

- UK REACH Candidate List
- UK REACH Authorisation List
- UK REACH Restriction List
  
- Swiss ChemO Candidate List
- Swiss ORRChem Authorisation List
- Swiss ORRChem Restriction List
  
- EU REACH Candidate List Intentions
- EU REACH Restriction List Intentions
- EU REACH Recommendations for Authorisation

# Overview Improved EU REACH Fidelity in the Tool

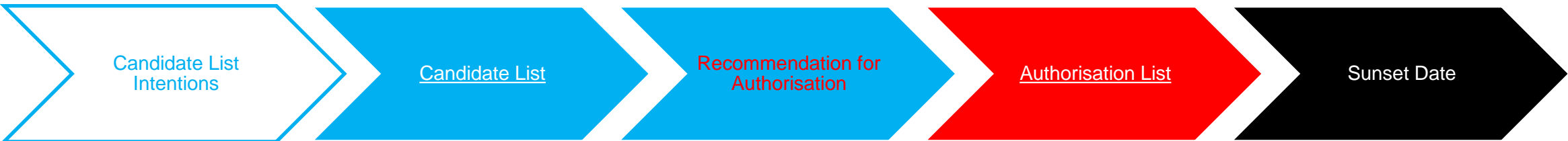
## Possible Restriction or Authorisation Precursor



## Possible Restriction Path



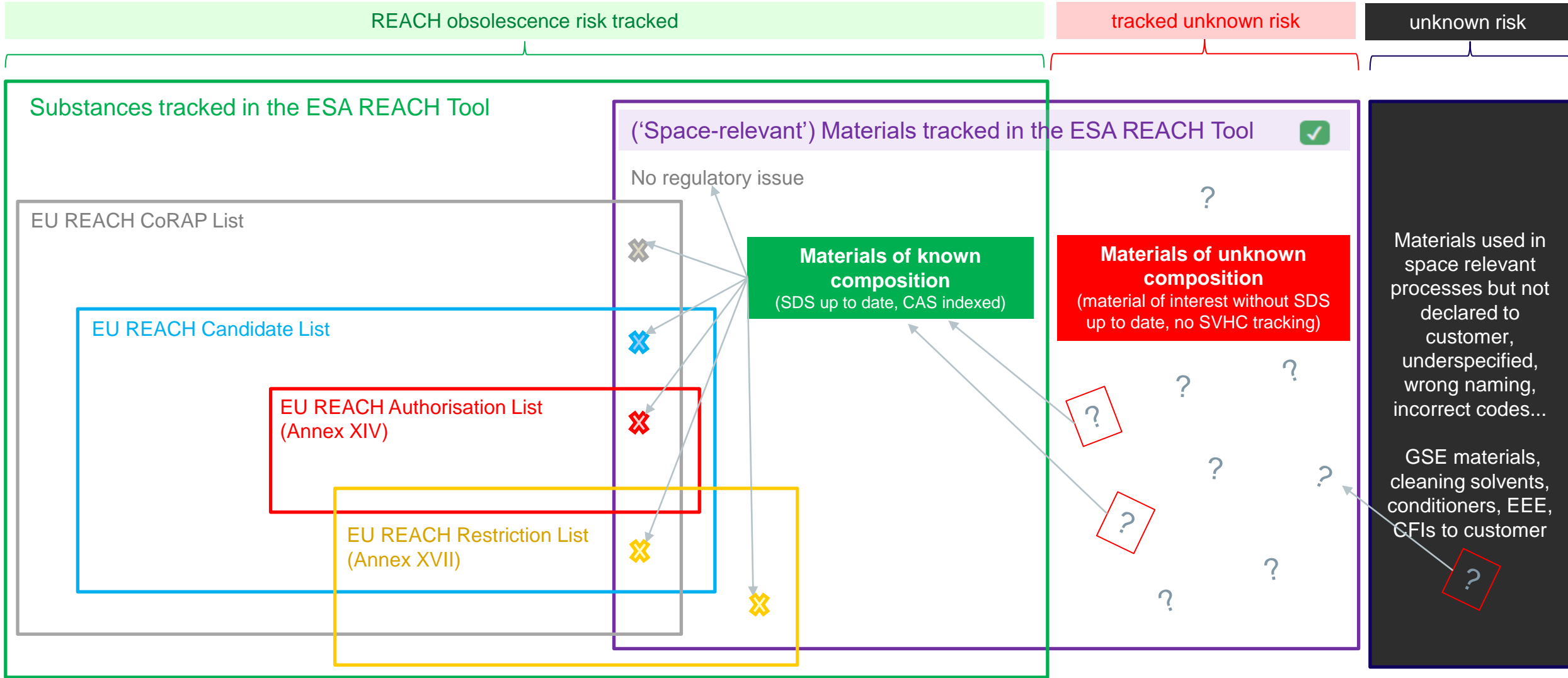
## Possible Authorisation Path



Aspects may change with the CSS REACH revision!

Source: MPTB List of Lists

# Overview **Obsolescence Risk**

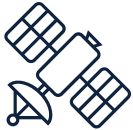


Note: It is impossible to perform a REACH cross-check/regulatory risk assessment if the CAS Numbers are not input to the ESA REACH Tool database

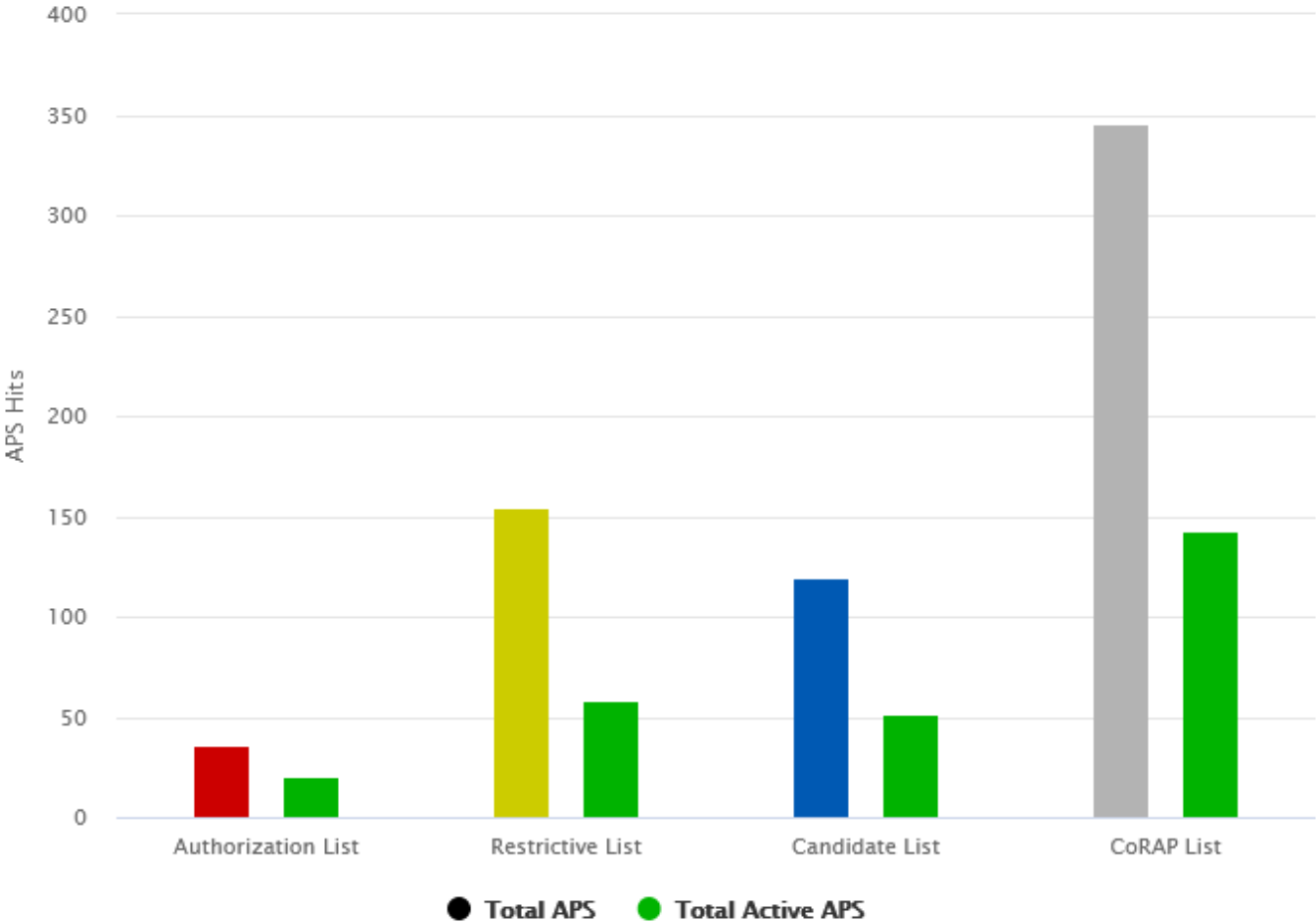
# Analysis Space Materials Statistics



**726**  
Substances



**907**  
Materials



Source: ESA REACH Tool

# Analysis Group Entries

- Manually analysing group entries is very time-consuming...
- No limit to the group entry size that can be analysed
  - See right (Restriction 27)
- Trend for more group entries
- Wide-scope PFAS restriction upcoming
  - 4700 to 12000 CAS Numbers to be analysed

Substance Name	Nickel and its compounds									
EC Numbers	-									
CAS Numbers	7440-02-0	27016-75-7	12795-30-1	1303-22-6	12068-61-0	13477-70-8	67632-50-2	18283-82-4	24640-21-9	15699-18-0
7785-20-8	16122-03-5	4454-16-4	14177-51-6	14177-55-0	14216-75-2	14220-17-8	14264-16-5	14267-17-5	14332-34-4	
14406-66-7	14428-08-1	14448-18-1	14507-36-9	14516-71-3	14522-99-7	14550-87-9	14708-14-6	14721-18-7	14874-78-3	
14949-69-0	14998-37-9	15060-62-5	15317-78-9	15521-65-0	15586-38-6	18718-11-1	18721-51-2	20437-10-9	20543-06-0	
21264-77-7	21784-78-1	22484-07-7	22605-92-1	25481-21-4	26043-11-8	27574-34-1	27637-46-3	28680-76-4	28984-20-5	
29204-84-0	29317-63-3	30868-55-4	30947-30-9	31748-25-1	33882-09-6	34831-03-3	35884-66-3	36026-88-7	36259-37-7	
15751-00-5	15780-33-3	15843-02-4	15843-91-1	15851-52-2	15852-21-8	16083-14-0	16337-84-1	16432-37-4	16812-54-7	
12503-49-0	12519-85-6	12607-70-4	12619-90-8	12653-76-8	12688-64-1	12794-26-2	13001-15-5	13007-90-4	13138-45-9	
13462-88-9	13462-90-3	13463-39-3	13478-93-8	13637-71-3	13654-40-5	13689-92-4	13770-89-3	13775-54-7	13842-46-1	
13859-60-4	13859-65-9	13869-33-5	13877-20-8	13927-77-0	14038-85-8	14055-02-8	14100-15-3	68334-36-1	68391-37-7	
68412-18-0	68511-62-6	68512-22-1	68515-84-4	68585-93-3	68607-31-8	68610-24-2	68611-43-8	68698-80-6	68758-60-1	
68784-84-9	68912-08-3	68958-86-1	68958-87-2	68958-88-3	68958-89-4	69011-05-8	69012-29-9	69012-50-6	69524-96-5	
70692-93-2	70824-02-1	70833-37-3	71243-96-4	71631-15-7	71720-48-4	71767-12-9	71889-22-0	71957-07-8	72139-08-3	
72152-45-5	72229-81-3	72828-53-6	72986-45-9	73892-02-1	76625-10-0	79102-62-8	79121-51-0	79817-91-7	83898-70-8	
84144-92-3	84604-95-5	84776-45-4	84852-35-7	84852-36-8	84852-37-9	84852-38-0	84852-39-1	85026-81-9	85135-77-9	
85166-19-4	85269-39-2	85480-75-7	85508-42-5	85508-43-6	85508-44-7	85508-45-8	85508-46-9	85551-28-6	85585-97-3	
85585-98-4	85585-99-5	85586-46-5	85958-80-1	90459-30-6	90459-31-7	90459-32-8	90459-33-9	90459-34-0	90459-35-1	
90459-36-2	91082-81-4	91082-84-7	91697-41-5	92200-98-1	92200-99-2	92502-55-1	93573-14-9	93573-15-0	93573-16-1	
93573-17-2	93762-59-5	93891-86-2	93920-08-2	93920-09-3	93920-10-6	93939-76-5	37211-05-5	37321-15-6	38465-55-3	
38780-90-4	38951-94-9	38951-97-2	39049-81-5	39819-65-3	547-67-1	553-71-9	557-19-7	1271-28-9	1295-35-8	373-02-4
4995-91-9	6018-92-4	6283-67-6	7580-31-6	7718-54-9	7757-95-1	7786-81-4	8007-18-9	10028-18-9	10101-96-9	
10381-36-9	11099-02-8	11113-74-9	11113-75-0	12003-78-0	12004-35-2	12007-00-0	12007-01-1	12007-02-2	12018-18-7	
12034-55-8	12035-36-8	12035-38-0	12035-39-1	12035-52-8	12035-64-2	12035-72-2	12054-48-7	12059-14-2	12059-23-3	
12142-88-0	12142-92-6	12168-54-6	12170-92-2	12175-27-8	12196-72-4	12201-89-7	12263-13-7	1313-99-1	1314-05-2	
1314-06-3	2223-95-2	3264-82-2	3333-67-3	3349-06-2	3349-08-4	3906-55-6	41476-75-9	42739-61-7	42844-93-9	
47726-62-5	51222-18-5	51818-56-5	51912-52-8	51931-46-5	52022-10-3	52486-98-3	52486-99-4	52496-91-0	52502-12-2	
52610-81-8	52625-25-9	56557-00-7	58591-45-0	60700-37-0	61300-98-9	61725-51-7	61788-71-4	63427-32-7	63588-33-0	
63597-34-2	63640-18-6	64696-98-6	65405-96-1	67763-27-3	67906-12-1	67952-41-4	67952-43-6	67952-69-6	67968-22-3	
68016-03-5	68025-13-8	68025-40-1	68025-41-2	68052-00-6	68130-36-9	68133-84-6	68134-59-8	68186-85-6	68186-89-0	
68187-10-0	68309-97-7	13940-83-5	182442-95-1	6018-89-9	134737-17-0	79745-01-0	14332-32-2	346417-97-8		
131866-99-4	177997-13-6	13477-97-9	15629-92-2	10101-97-0	10101-98-1	34492-97-2	1314-04-1	12035-71-1	16039-61-5	

... >400 CAS Numbers

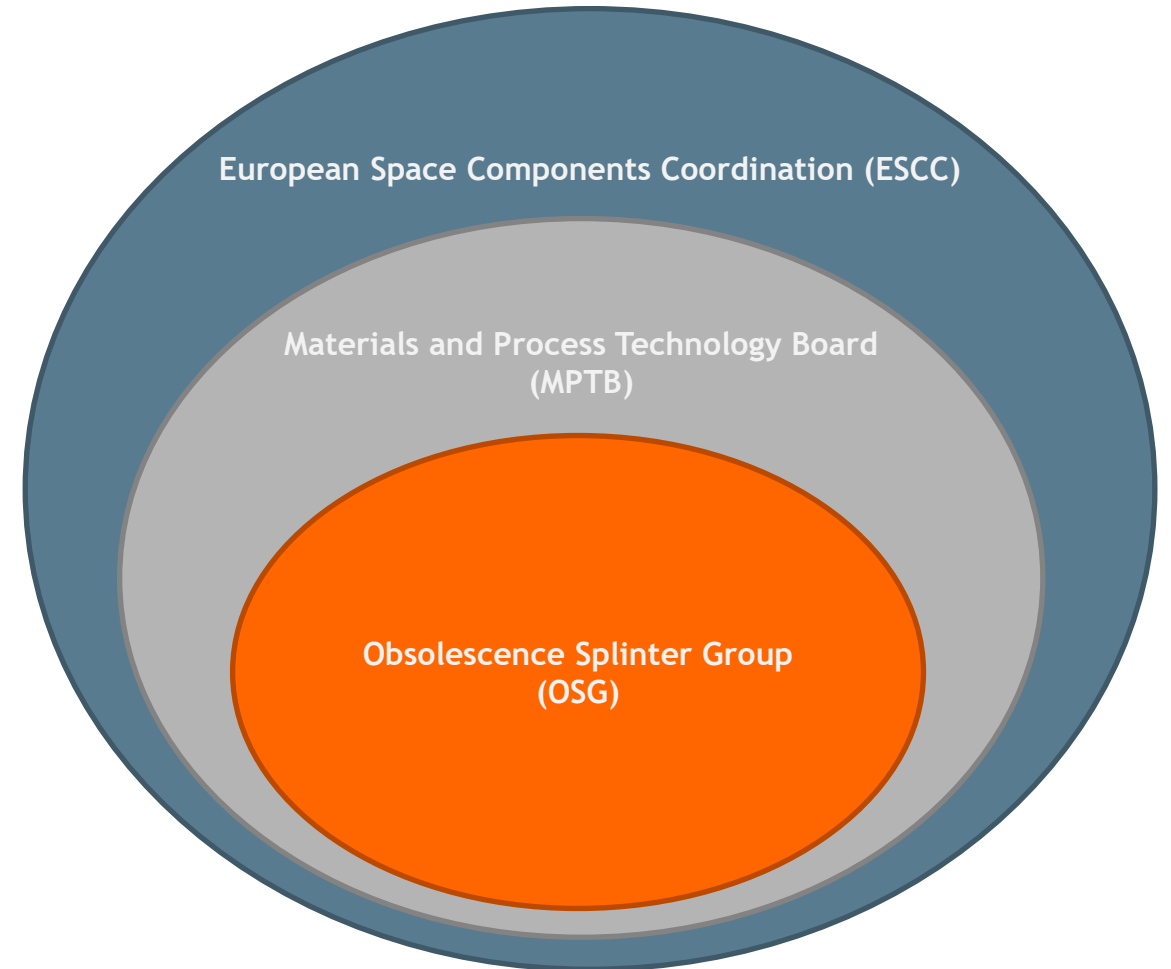
# Conclusions

## ESA REACH Tool Access

- Currently only available to ESA and the Obsolescence Splinter Group (OSG)
- **No confidential** information, data entry is entirely voluntary
- Working on a solution to give space **SMEs access**, express interest below:

To request access to the ESA REACH Tool, please contact:

[reach.officer@esa.int](mailto:reach.officer@esa.int)  
or scan the QR Code





# Conclusions Acknowledgements & Further Reading

I'd like to thank the following for their continued support on the ESA REACH Tool project:

- Jorge Sanchez Seijo (TERMA for ESA)
- John Hansen (TERMA for ESA)
- Laura Feasey (REACHLaw)
- Premysl Janik (ESA)
- Tim Becker (REACHLaw)

➤ For more information on automated materials obsolescence management systems, please read my article in Chemical Watch & Poster

## How can automated systems help mitigate the risks of obsolescence caused by REACH?

INSIGHT | EXPERT FOCUS | 12 September 2022

Oliver Reiff-Musgrove, regulatory consultant, REACHLaw UK, looks at how to stay ahead of the challenges the regulation presents

Europe | PFAS | EU REACH



### The Design, Development and Application of the ESA REACH Tool - A Digital Materials Obsolescence Management Tool

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**ABSTRACT**  
This article automates the successful software development undertaken by ESA to create a novel digital tool to evaluate and mitigate against potentially costly materials obsolescence risks to space projects that arise from the EU chemical regulation REACH. It highlights the advantages of creating an automated system for tracking substances of very high concern (SVHC) against a material list of space-relevant materials, a collaboration with collaborators with capabilities. The results of the tool using the European Chemical Agency (ECHA) Registration File, the European Chemical Agency (ECHA) Compliance and the management, are also discussed. The paper demonstrates the versatility of an automated tool compared with prior materials obsolescence management methods, by highlighting the functionality developed in the project. Examples of how the tool extracts available from the ESA REACH Tool can provide powerful insights and automation of REACH-related data are discussed. Finally, the application and broader use of the ESA REACH Tool for active obsolescence risk analysis and mitigation are discussed, including the collaborative cooperation needed for the space sector to overcome the current challenges in an ever-changing chemical regulatory landscape.

**INTRODUCTION**  
Registration, Evaluation and Authorization of Chemicals (REACH) is an essential EU chemical regulation that aims to protect human health and the environment. In the EU, REACH has the power to set or restrict substances critical to the space sector either at the EU or a project level. Space projects themselves often exceeding years, customer selected for a spacecraft can become obsolete or non-compliant with REACH, requiring a search for alternatives and potentially costly requalification campaigns.

**EU REACH Substances List**

Compliance Obligations	None	Check and label	Restrictions on certain uses	Not authorized
Obsolescence Risk	Low	Medium	High	Very High

**DESIGN**  
The tool accesses regulatory substance lists and cross-references them against a list of space-relevant materials. Substance lists is provided by the administration of REACH - the European Chemical Agency (ECHA). Space-relevant materials were gathered from ESA internal and external lists, and chemically indexed using Safety Data Sheets (SDS). Dynamic cross-referencing requires a visual algorithm to identify and categorize the identification of specific substances. Material synthesis and performance records were added to help users trace back the connectivity across the pattern, reducing the need for testing.

**APPLICATION**  
The ESA REACH Tool features in active use by ESA since January 2020, and by external members of the national and European aerospace industry. Since 2019, the tool is part of the European Space Agency's (ESA) REACH compliance strategy.

**CONCLUSIONS**  
• Automated development of an automated REACH-obsolescence management tool.  
• Automated integration of EU REACH list substance data directly from ECHA, in addition to the legacy of chemical regulatory data from the active infrastructure.  
• Application of the tool has significantly reduced the burden of REACH list exposure analysis and historical material obsolescence management.  
• Further development of the ESA REACH Tool will help other ESA tools gain access to REACH-obsolescence data.

**ACKNOWLEDGMENTS**  
The authors would like to thank all their colleagues for their work on the project, in particular they express their gratitude to a number of key staff for their support in the development of the ESA REACH Tool and T. Becker (REACHLaw) for the continued support of REACH systems. Additionally, they would like to thank J. Tapia-Borromeo (ESA) for the invaluable help with the data used at the start of the project. The presented poster and development of the tool was supported by ESA/ESTEC contract CT/2400000000/2020.

**REFERENCES**  
1. Reiff-Musgrove, O. (2022) Automated systems help mitigate the risks of obsolescence caused by REACH. Chemical Watch & Poster, 2022, 12(9), 12-14.  
2. Reiff-Musgrove, O. (2022) Automated systems help mitigate the risks of obsolescence caused by REACH. Chemical Watch & Poster, 2022, 12(9), 12-14.  
3. Reiff-Musgrove, O. (2022) Automated systems help mitigate the risks of obsolescence caused by REACH. Chemical Watch & Poster, 2022, 12(9), 12-14.

**REACHLAW**  
www.reachlaw.fi

To request access to the ESA REACH Tool, please contact: reachlaw@reachlaw.fi or visit the ECHA Code

# Thank you for listening!

Any Questions?

Contact: [oliver.reiff-musgrove@reachlaw.fi](mailto:oliver.reiff-musgrove@reachlaw.fi)

Request Access: [reach.officer@esa.int](mailto:reach.officer@esa.int)

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