

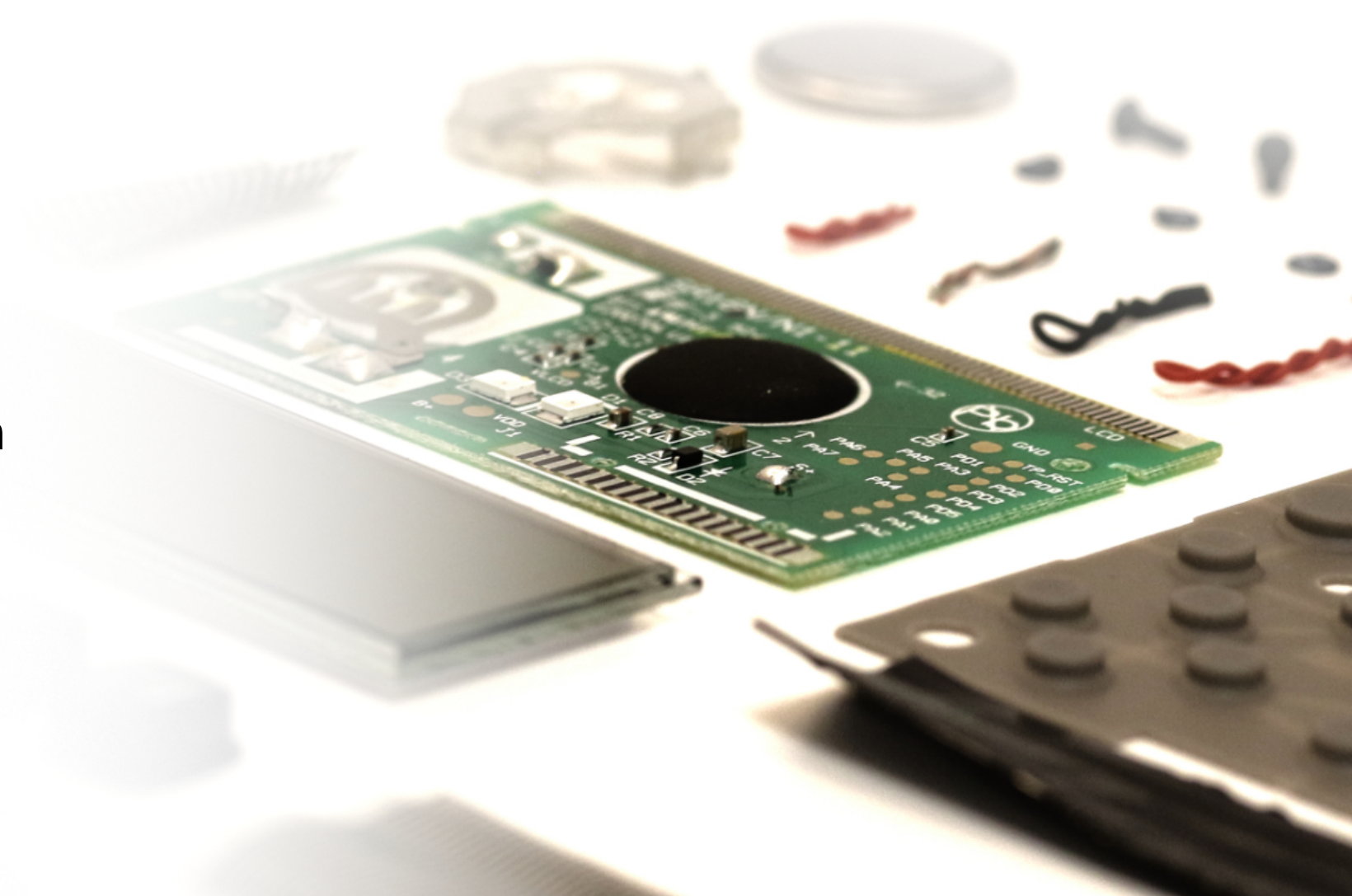


Claigan Webinar

PFAS Compliance in Practice

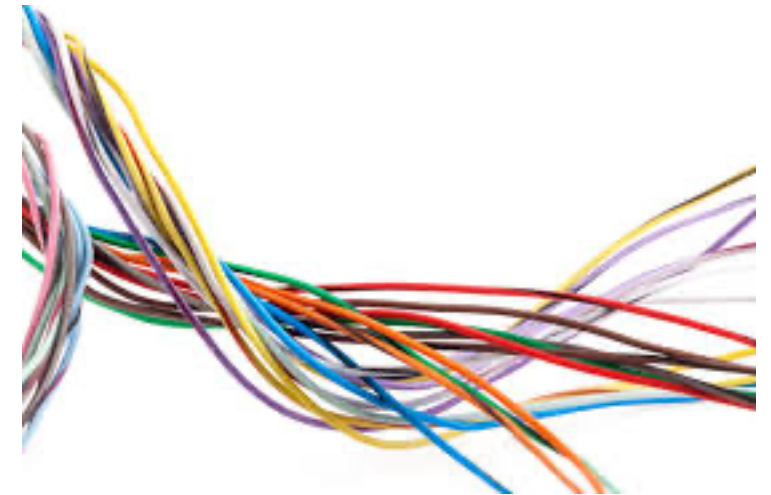
Presented by:
Bruce Calder
VP Consulting Services at Claigan

January 18, 2023



Overview - Agenda

- PFAS Regulation Global
 - Reporting
 - Restriction
- PFAS uses in a nutshell
 - Articles
 - Chemicals
- Overlap between reportable and restricted PFAS
- An Example Company
 - Process and stages
 - Enforcement and due diligence
 - Articles and chemicals
- Q&A



Globally PFAS Restrictions

- Restricted (PFOA)
 - EU (+related non-EU related countries. Ex. Switzerland)
 - California (Proposition 65) - warning



- Planned Restrictions
 - Canada (Canadian Prohibition) - Date TBD (at 1ppm)
 - Vietnam - Date TBD (at 1ppm)
 - Singapore (very limited product scope)



Globally PFAS Reporting

- Reporting
 - Maine (2023)
- Projected reporting (not finalized)
 - US (federally) - TSCA (does not apply to FDA regulated devices)
 - US (state level)
 - State by state but expected to mirror Maine
 - Canada (Section 71)



PFAS Reporting

- **Standard data to be reported**
 - *By product or product family*
 - Description of the product
 - Purpose of PFAS used
 - PFAS substances
 - Weight
 - By CAS#
 - Contact information
 - Name and address of company
 - Name and contact information of contact person

PFAS Reporting - *Future*

- **Future data**
 - Plan for replacement of PFAS
 - Alternatives
 - Justification for continued use

- Follow on expected after initial reporting

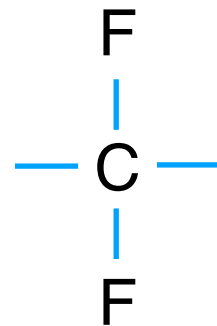
PFAS Restrictions

- **Restriction requirements**
 - *For products in scope*
 - Cannot have the PFAS in a component above regulated limit
 - Usually 25 ppb
 - No specific declaration or other paperwork requirement

PFAS Simplified - Part I

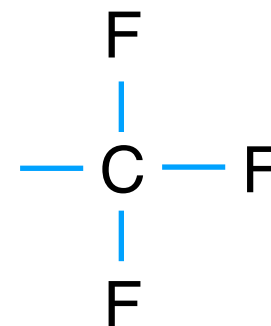
- **What is a PFAS?**
 - Has a fluorinated methylene or methyl group.

Fully Fluorinated
Methylene



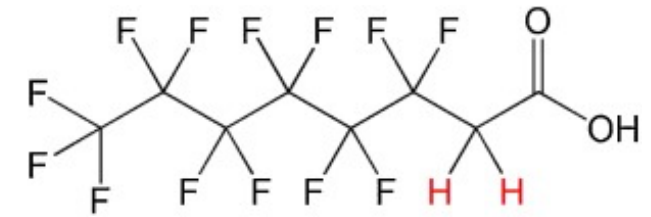
And/or

Fully Fluorinated
Methyl

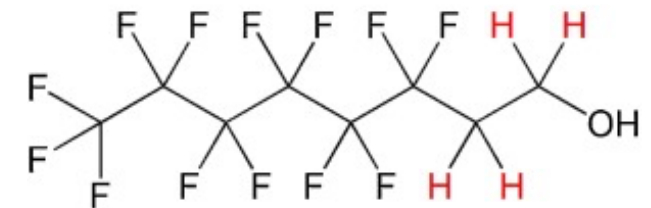


PFAS Simplified - Part 2

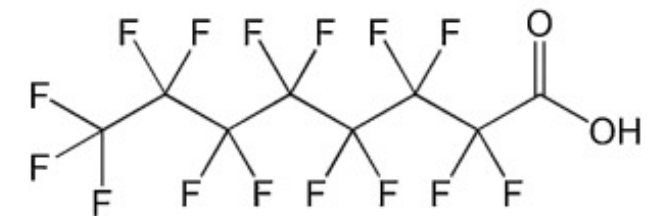
- **Non-Polymer PFAS**
 - Non-repeating PFAS (non-polymer)
- **Polymer PFAS**
 - Repeating chains



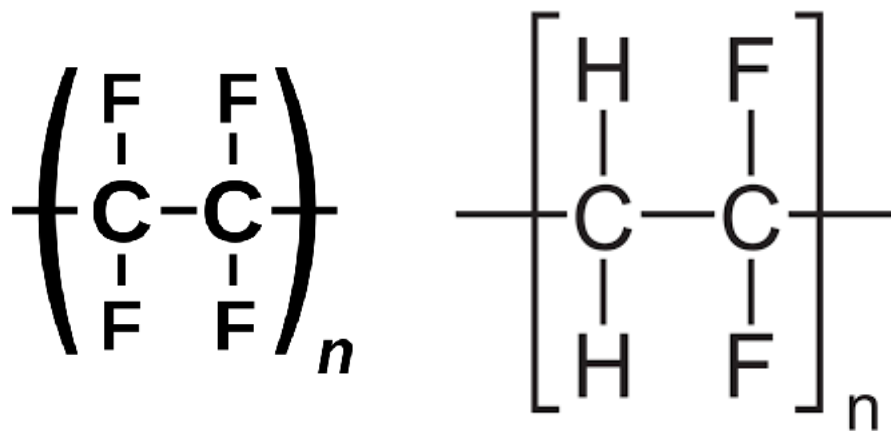
6:2 FTCA



6:2 FTOH



PFOA



Overall Main Uses of PFAS

PFAS Use	Description
Heat Transfer Fluids	Fluids to transfer heat in large scale electronics
Fire Suppression Fluids	Aqueous fire fighting foams
Solvent Cleaning and Degreasing	Degreasing of machined or electroplated parts
PTFE Powder	Powder for curing into solid fluoropolymers
Liquid and Stain Repellant	Side chain polymers for water and stain repellency
Cosmetics	'Silky' makeup additives in high spf makeups
Chemical Resistant Plastic	Fluorinated polyethylene containers

Main Uses in Physical Products

Part I

- PFAS as a solid polymer
 - Powder cured / fused into
 - Solid part (ex. PTFE part)
 - Solid coating (ex. Teflon pan)



Cured at
~400C



Solid part

Or

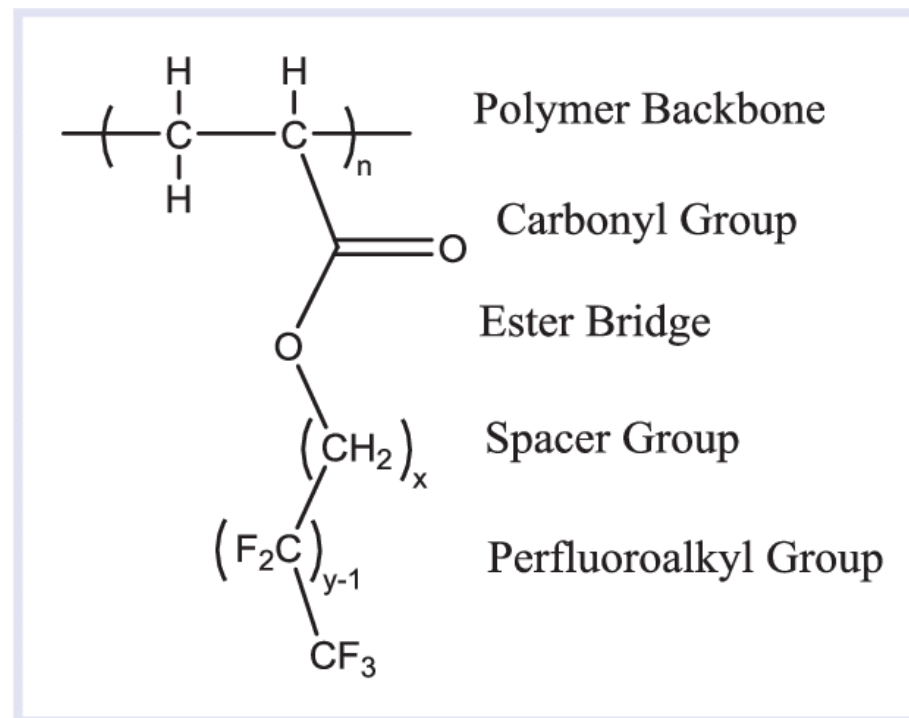


Coated metal

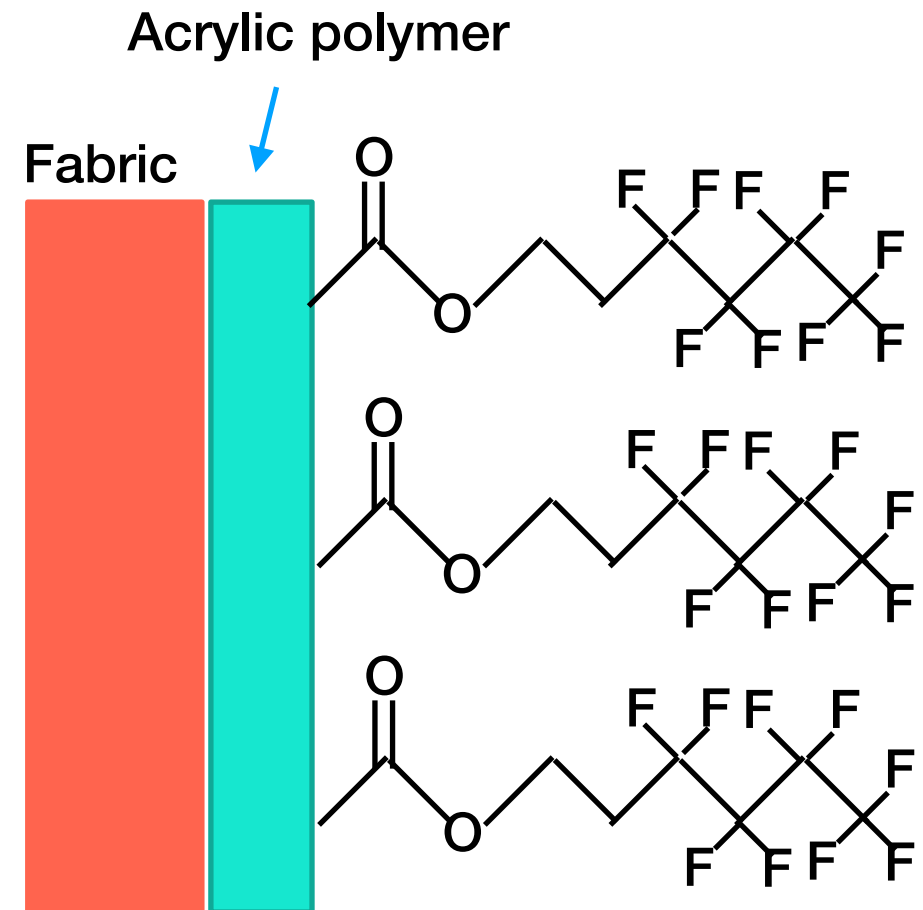
Main Uses in Physical Products

Part 2

- PFAS as a 'side chain polymer'
 - Acrylic or other polymer
 - With chains of PFAS extending from polymer
 - Example - water repellent coatings



Side chain PFAS



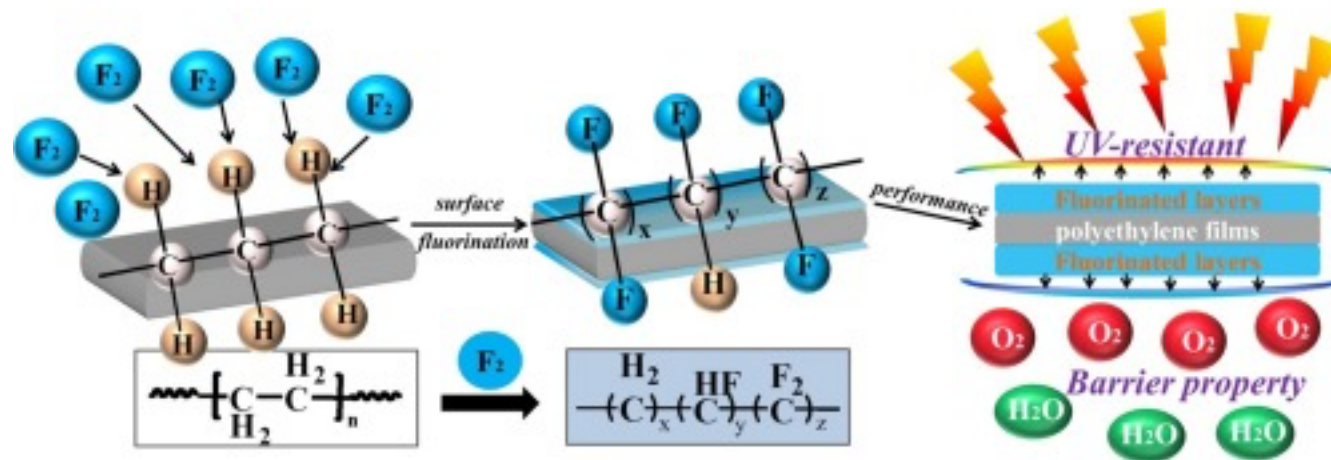
Side Chain PFAS

Main Uses in Physical Products

Part 3

- PFAS formed by fluorinated and oxygenating polymers
 - Example - fluorinated polyethylene
 - Bombarding polyethylene with fluorine and oxygen gases
 - Creates chemically resistant polyethylene container

Bombarding polyethylene with F_2 and O_2



PFAS Reporting - *Repeated*

- **Standard data to be reported**
 - *By product or product family*
 - Description of the product
 - Purpose of intentionally added PFAS used
 - PFAS substances
 - Weight
 - By CAS#
 - Contact information
 - Name and address of company
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PFAS Reporting - *Future*

- **Future data**
 - Plan for replacement of PFAS
 - Alternatives
 - Justification for continued use

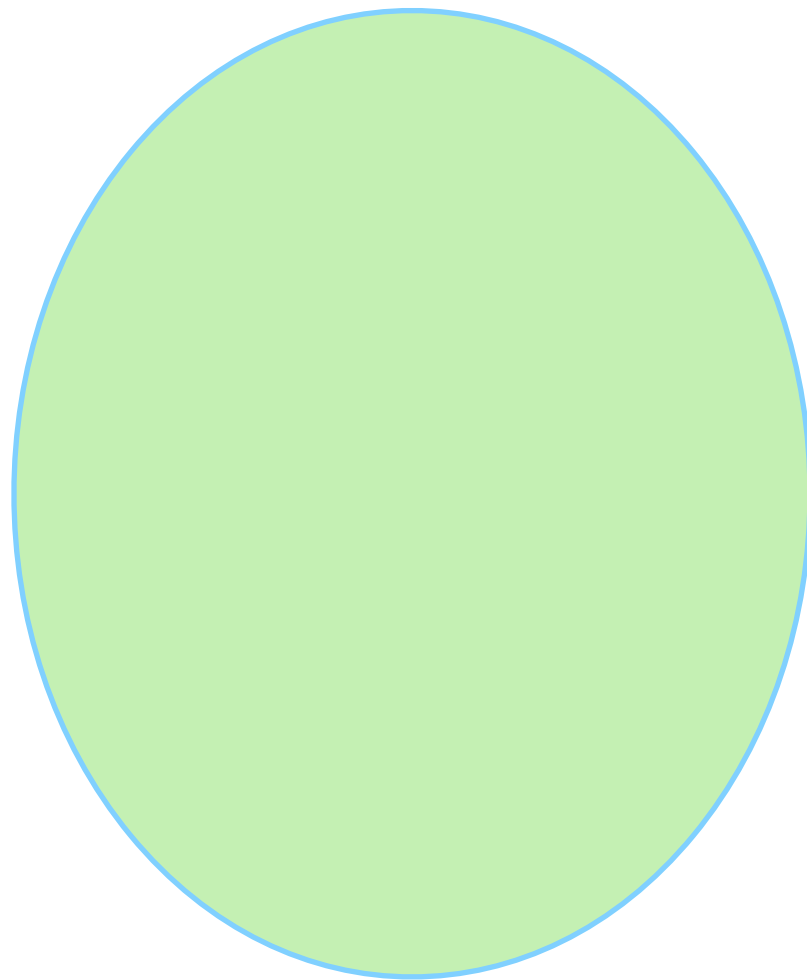
- Follow on expected after initial reporting

PFAS Restrictions - *Repeated*

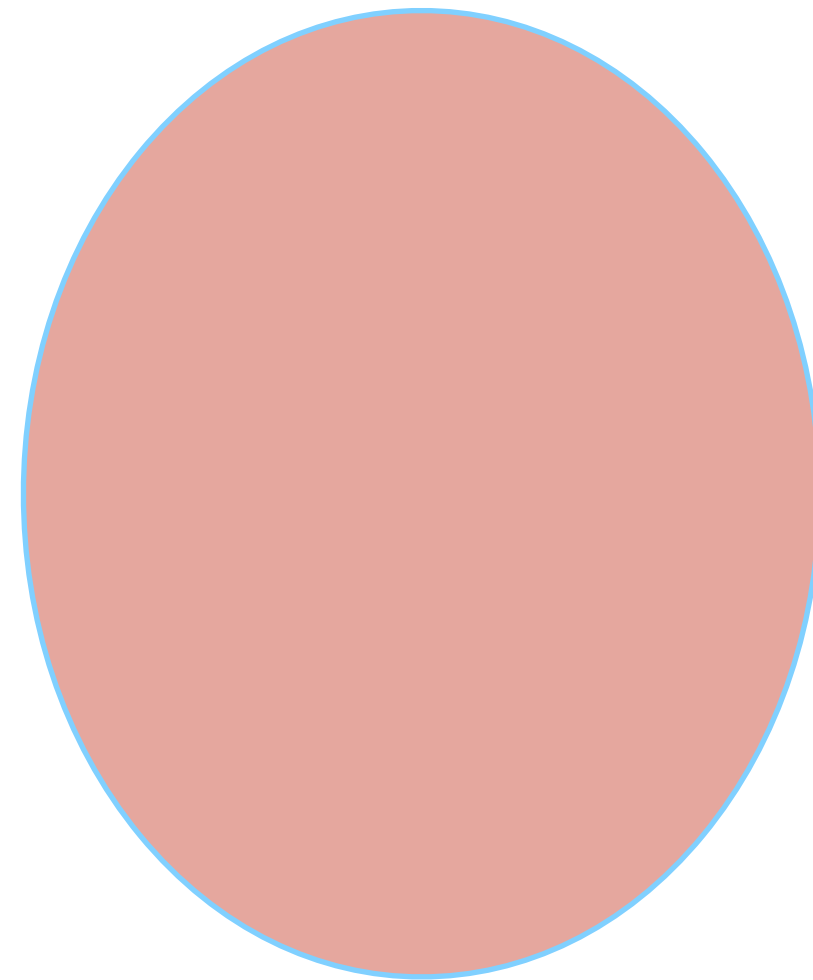
- **Restriction requirements**
 - *For products in scope*
 - Cannot have the PFAS in a component above regulated limit
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Venn diagram - Reportable vs Restricted

Venn diagram of PFAS in Articles



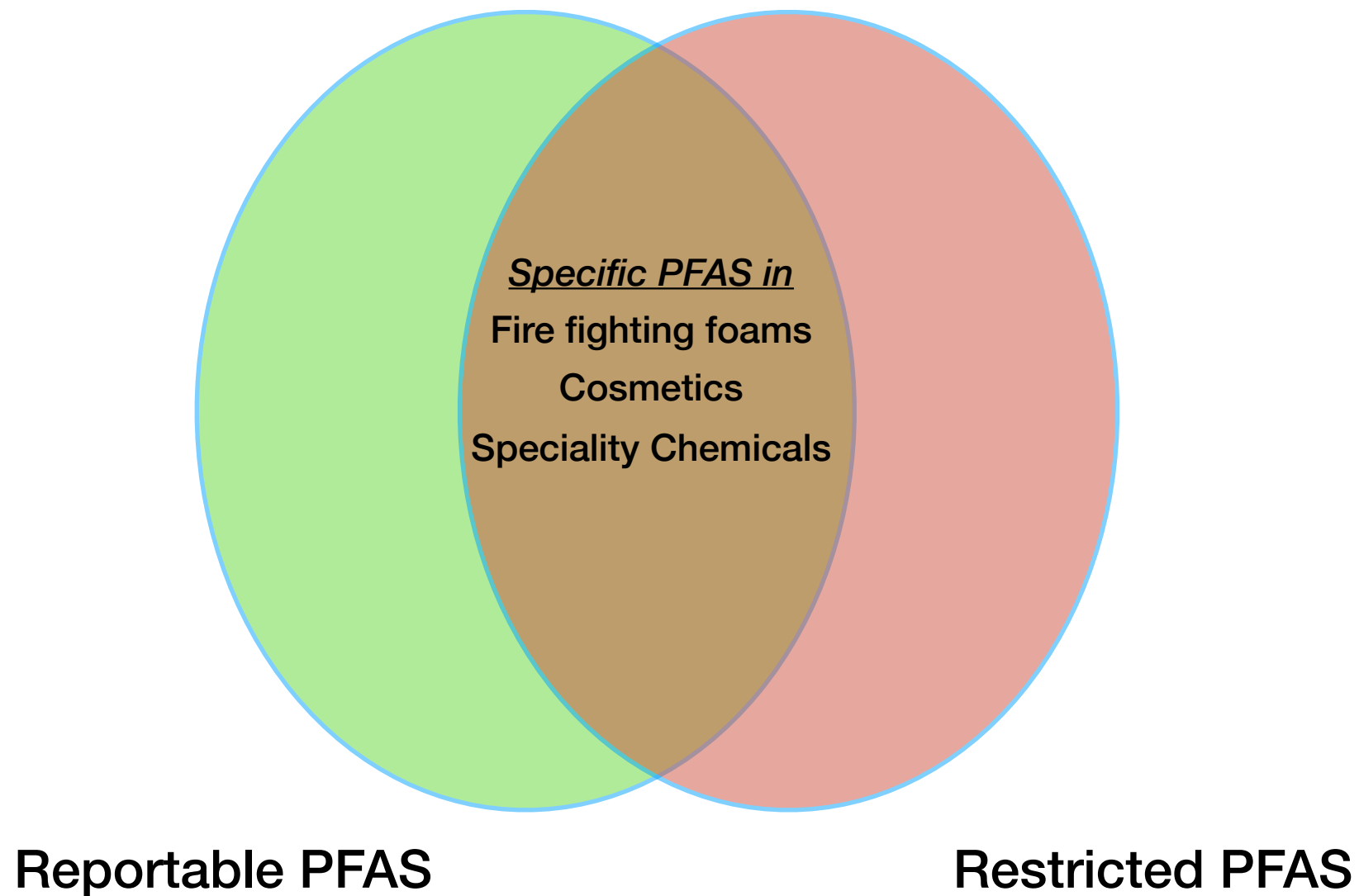
Reportable PFAS



Restricted PFAS

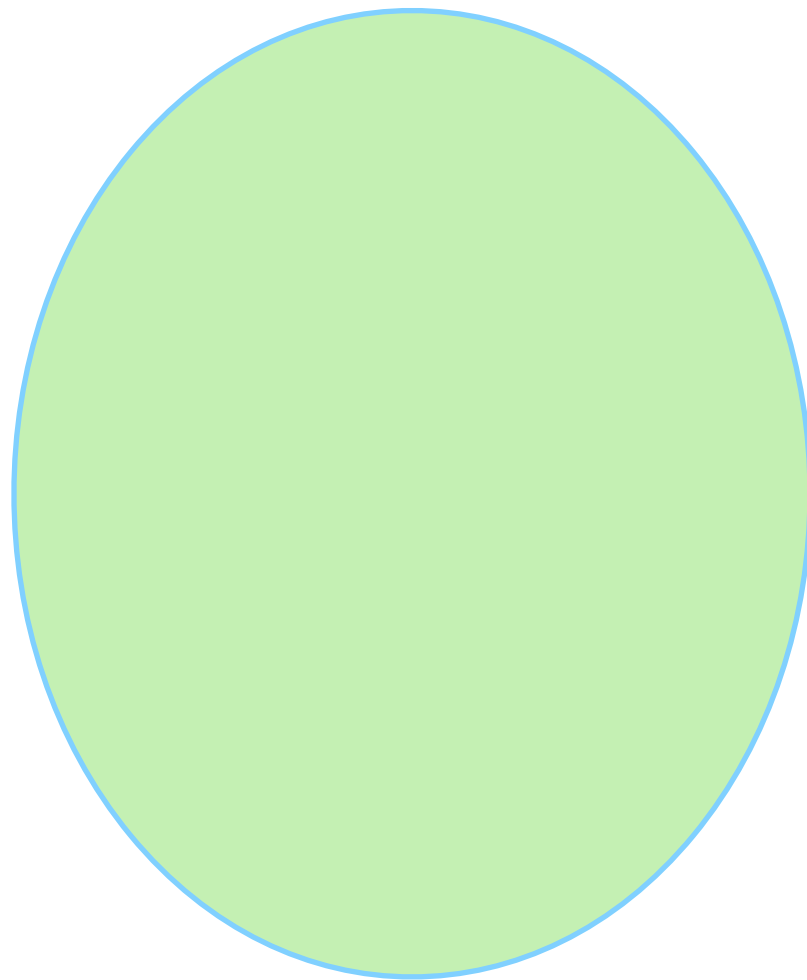
Venn diagram - Reportable vs Restricted

Venn diagram of PFAS in Chemicals

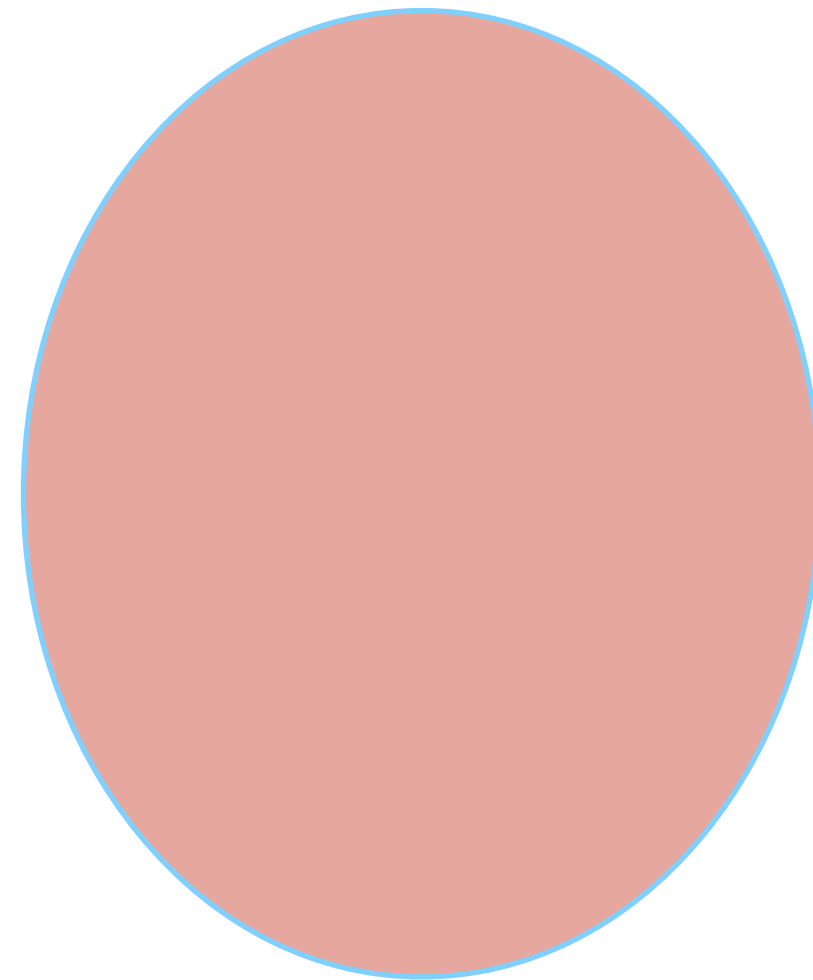


Venn diagram - Reportable vs Restricted

Venn diagram of PFAS in Articles



Reportable PFAS



Restricted PFAS

Venn diagram - Reportable PFAS that Could Contain Restricted PFAS

Venn diagram of Reportable PFAS
that could contain unintentional restricted PFAS



Reportable PFAS

Unintentionally added Restricted PFAS

Now what?

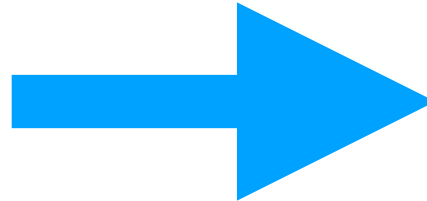
- **Ok....**
 - I understand I may have to report
 - I understand I may have restricted PFAS
 - I have a lot of products

- Now what?

- Because that walk through chemistry lane was fun and all, but I am not a chemist.

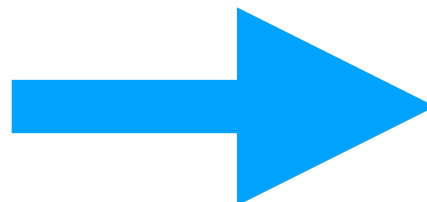
Example Company

Consumer Product Lines



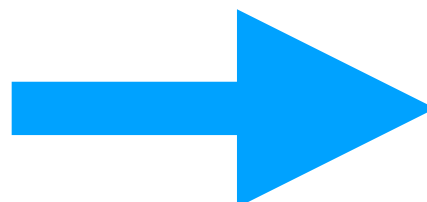
67% Legacy
33% New

Professional Product Lines



80% Legacy
20% New

Reagents and Chemicals



80% Legacy
20% New

PFAS Compliance Process

Products



Claigan



4 to 6 weeks



Reporting



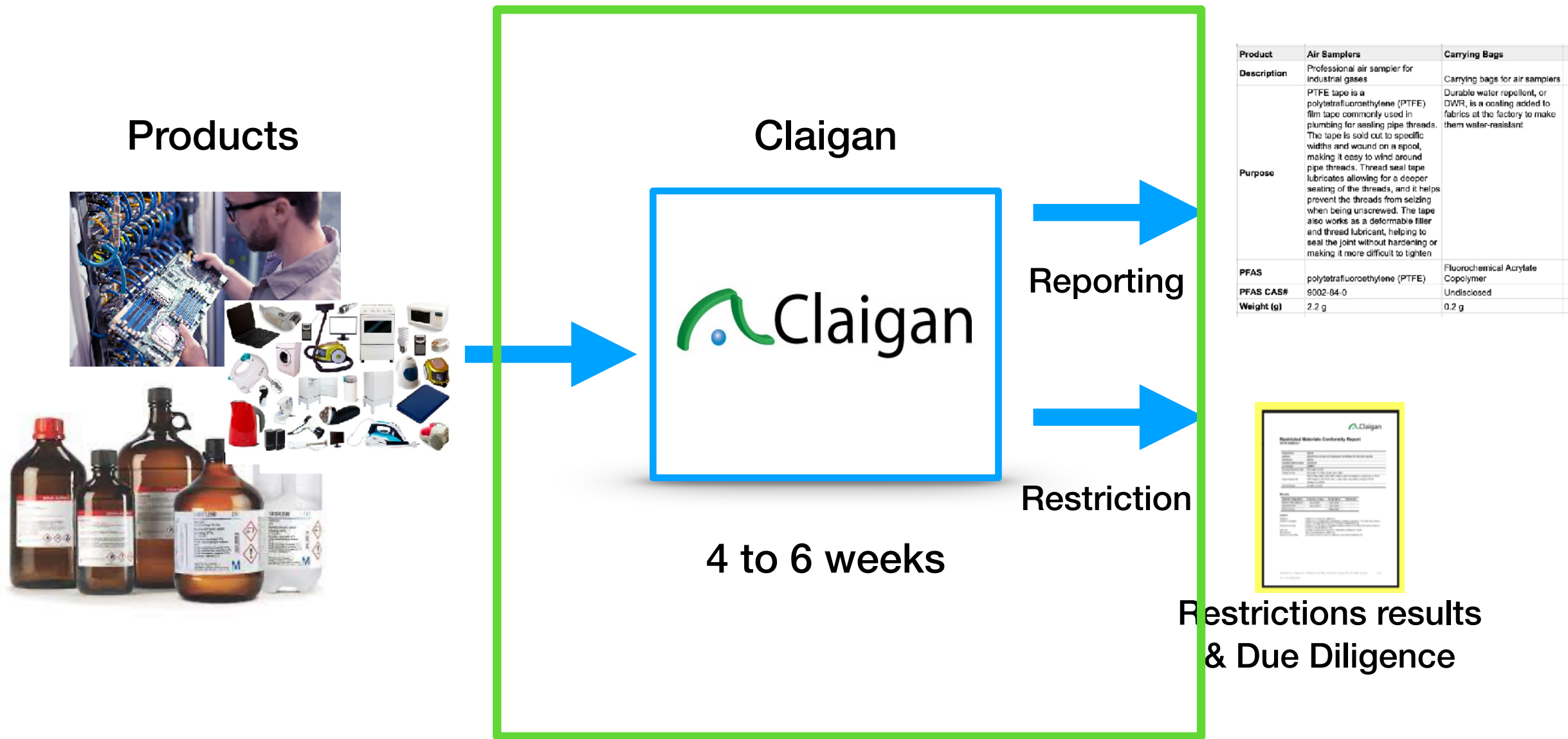
Restriction

Product	Air Samplers	Carrying Bags
Description	Professional air sampler for industrial gases	Carrying bags for air samplers
Purpose	PTFE tape is a polytetrafluoroethylene (PTFE) film tape commonly used in plumbing for sealing pipe threads. The tape is sold out to specific widths and wound on a spool, making it easy to wind around pipe threads. Thread seal tape lubricates allowing for a deeper seating of the threads, and it helps prevent the threads from seizing when being unscrewed. The tape also works as a deformable filler and thread lubricant, helping to seal the joint without hardening or making it more difficult to tighten	Durable water repellent, or DWR, is a coating added to fabrics at the factory to make them water-resistant
PFAS	polytetrafluoroethylene (PTFE)	Fluorochemical Acrylate Copolymer
PFAS CAS#	9002-84-0	Undisclosed
Weight (g)	2.2 g	0.2 g



Restrictions results & Due Diligence

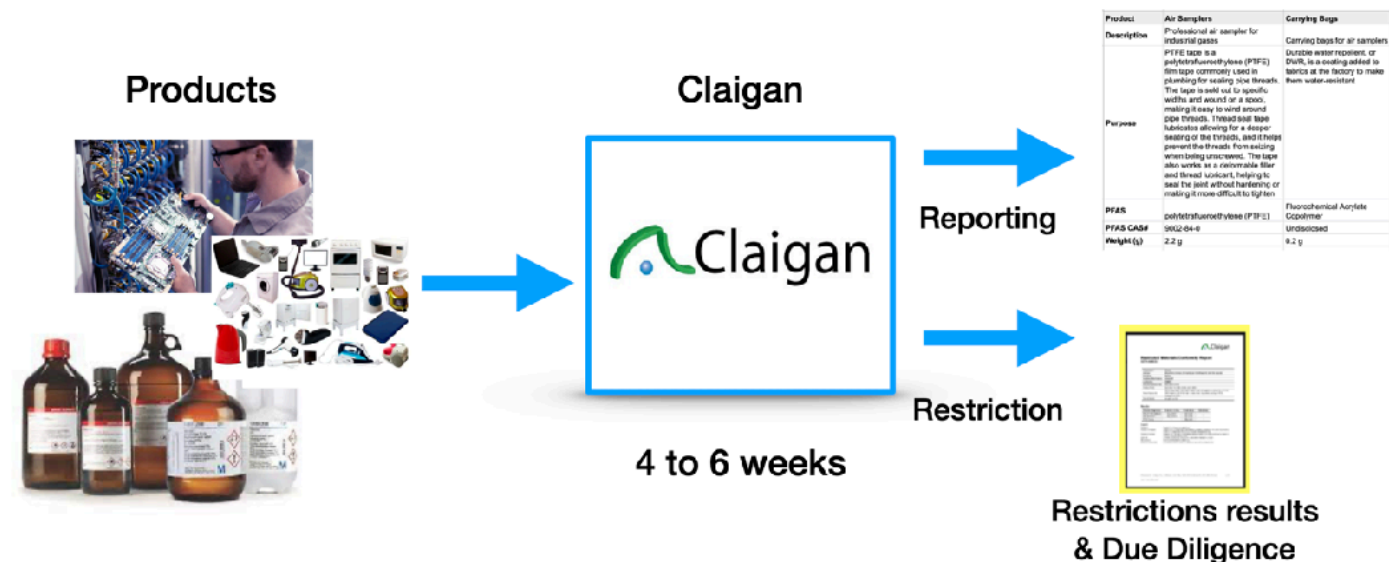
PFAS Compliance Process



What goes into Claigan's process?

PFAS Compliance Process Articles (Current Products)

- **Phases**
 - *Identify representative products*
 - *BOM Review*
 - *Public search / double check*
 - *Testing of select components*
 - *Summary of results*



PFAS Compliance Process Articles (Current Products)

- **Phases**

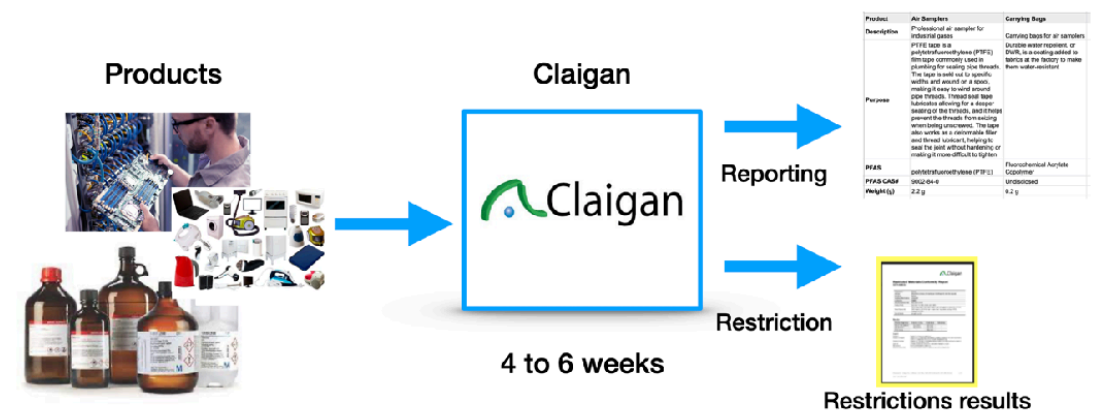
- *Identify representative products*

- Identify representative product to represent product line

- **Purpose**

- Reasonable proxy for reporting

- Representative unit for restrictions



PFAS Compliance Process Articles (Current Products)

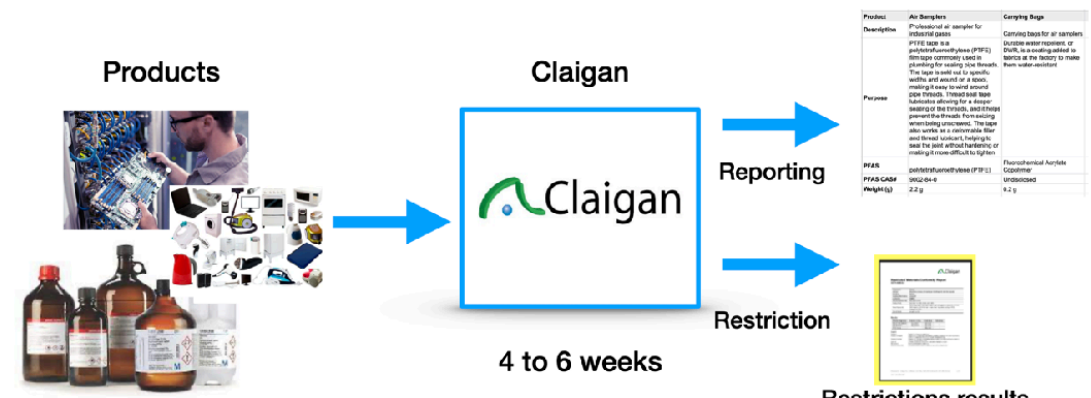
- **Phases**

- *BOM Review*

- Identify obvious PFAS containing parts
 - Example - 'PTFE tape'
- Identify likely PFAS containing parts
 - Takes more knowledge

- Purpose

- 'Low hanging fruit' declarables (and restriction risk)
- Justifiable parts for testing for reportable and restrictions



PFAS Compliance Process Articles (Current Products)

- **Phases**

- *Public search / double check*

- Search google and distributors for fluoro parts

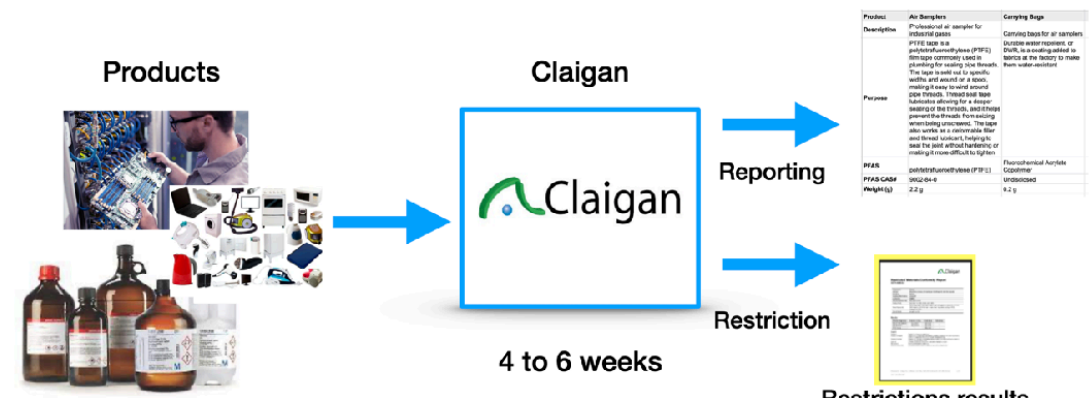
- Search key fluoro words and company

- **Purpose**

- Identify fluoro parts not picked up in the BOM screening

- Example - PTFE replacement tape

- Identify the parts that the regulators would see



PFAS Compliance Process Articles (Current Products)

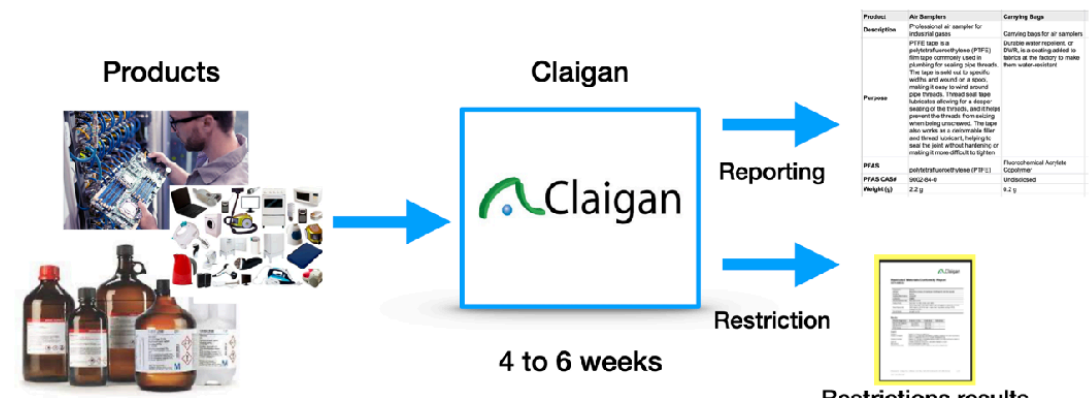
- **Phases**

- *Testing of select components*

- For fluoro presence (likely parts)
- For restricted substances (in fluoro positive parts)

- **Purpose**

- Provide fundamental data for reporting
- Provide data on restriction
- Identify components with restriction
- Provide due diligence



Notes on Compliance / Enforcement

- **Reporting**
 - Reporting on instances and uses
 - Not finite details
- **Restriction**
 - Enforcement is based on
 - Did not do the work that was required
 - Fined related to what effort competition spent
 - Or, the amount of non-compliant materials
 - Which is generally ug's for PFOA

PFAS Compliance Process Articles (Current Products)

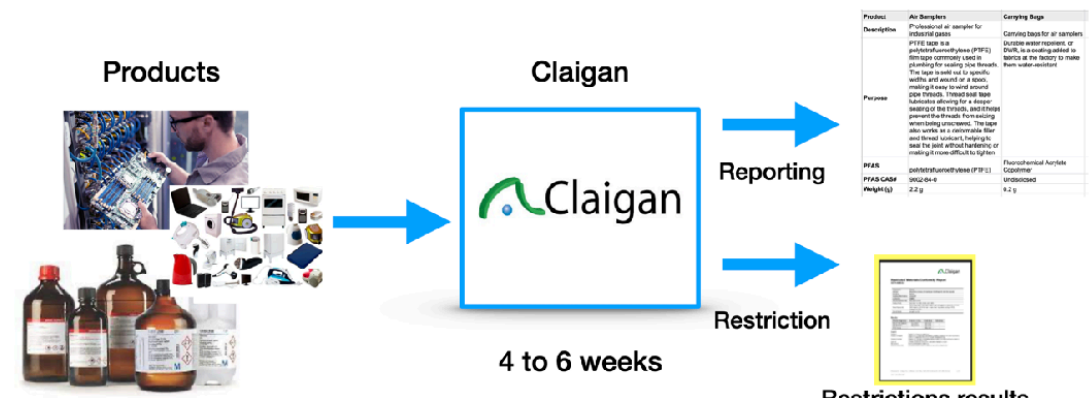
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PFAS Compliance Process Articles (Current Products)

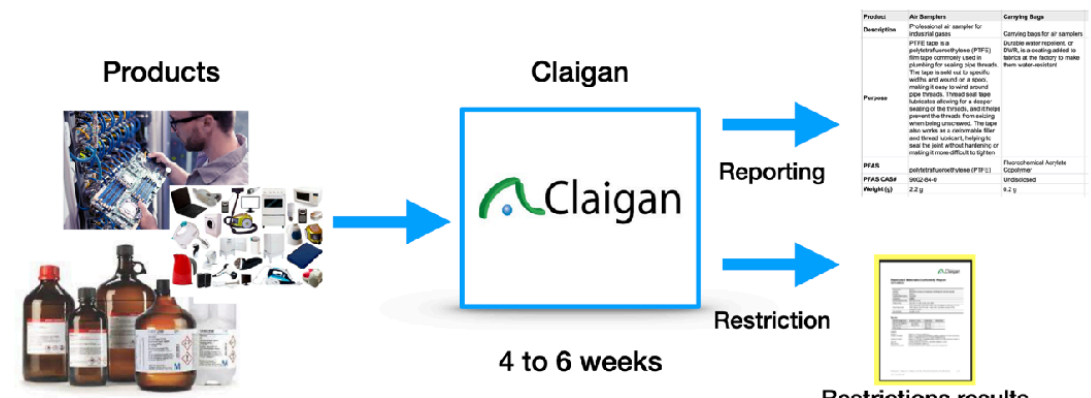
- **Phases**

- *Summary of Results*

- Summary of results to report
 - Including descriptions, uses, weights, and chemical info
- Report on restrictions testing results

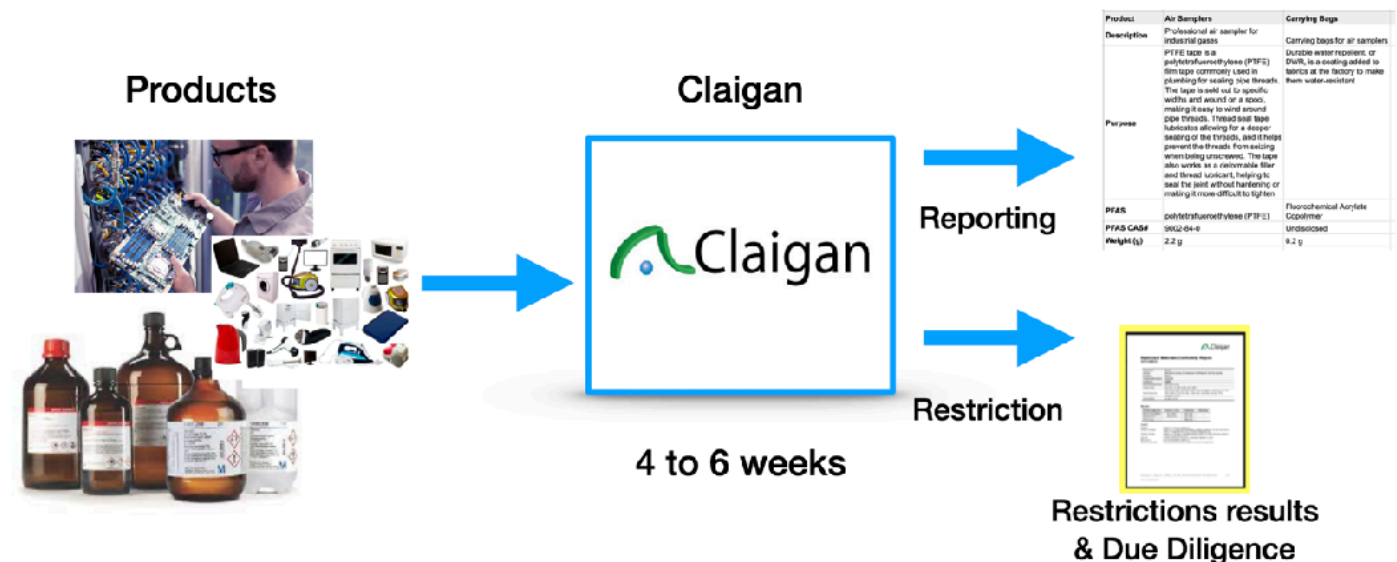
- **Purpose**

- Provide specific data to report
- Provide report on product and restricted chemicals
 - Identify components with restricted chemicals
 - Provide due diligence



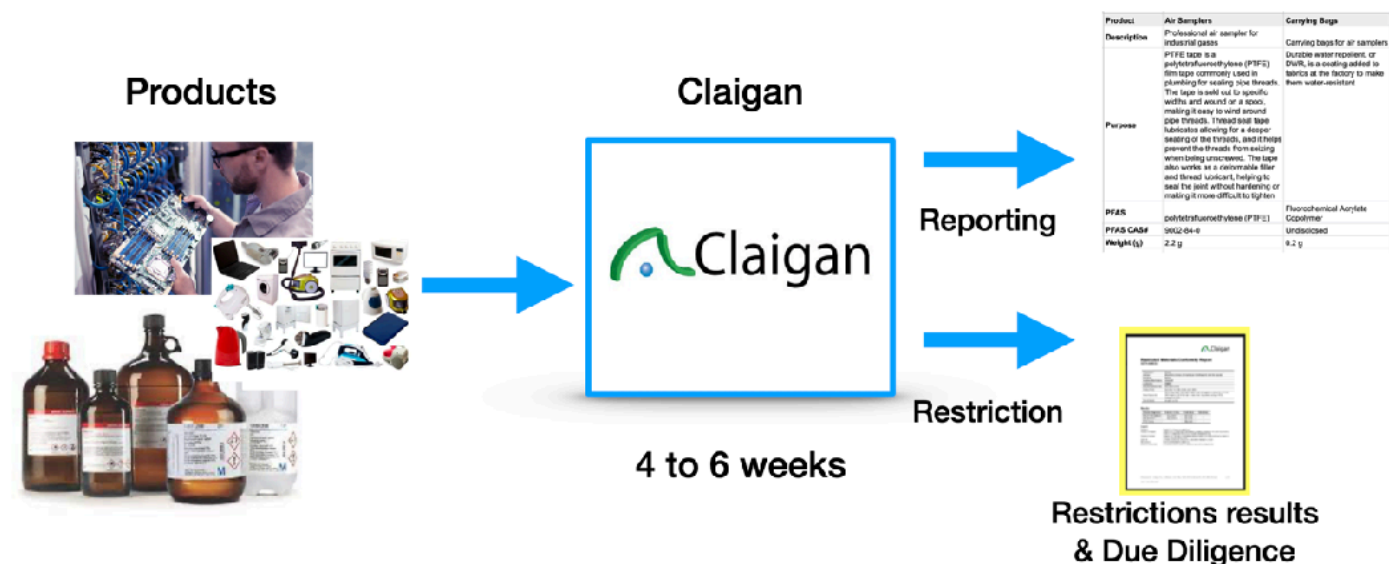
PFAS Compliance Process Articles (New Products)

- **New designs**
 - Combine with testing for all global requirements
 - Same consistent timelines
 - Same concise report
 - Cost advantages
 - Or
 - Use the same process as current products



PFAS Compliance Process Chemicals

- **Chemical products**
 - Review SDS for fluoros
 - Takes a decent knowledge
 - Test for restricted chemicals for appropriate fluoros



PFAS Compliance Process

Products



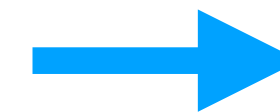
Claigan



4 to 6 weeks



Reporting



Restriction

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PFAS	polytetrafluoroethylene (PTFE)	Fluorochemical Acrylate Copolymer
PFAS CAS#	9002-84-0	Undisclosed
Weight (g)	2.2 g	0.2 g



Restrictions results & Due Diligence

Next Claigan Webinar

Jan 17 2023 REACH SVHC Update

- Nine (9) substances are approved to be SVHC
- REACH SVHC Update
 - reaction mass of 2,2,3,3,5,5,6,6-octafluoro-4-(1,1,1,2,3,3,3-heptafluoropropan-2-yl)morpholine and 2,2,3,3,5,5,6,6-octafluoro-4-(heptafluoropropyl)morpholine
 - Perfluoroheptanoic acid and its salts
 - Isobutyl 4-hydroxybenzoate (isobutylparaben)
 - Barium diboron tetraoxide
 - 4,4'-sulphonyldiphenol
 - **Bis(2-ethylhexyl) tetrabromophthalate (BTPH)***
 - **1,1'-[ethane-1,2-diylbisoxo]bis[2,4,6-tribromobenzene] (BTBPE)***
 - **2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol (TBBPA)***
 - **Melamine***



- * These four will affect the SCIP declaration of virtually all electronics
- Webinar expected to be held on Feb 1st

PFAS Compliance Process

Products



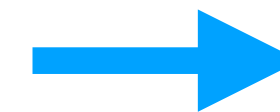
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4 to 6 weeks



Reporting



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Q&A