# Validation Services

## Extractables and Leachables Testing

MilliporeSigma is the U.S. and Canada Life Science business of Merck KGaA, Darmstadt, Germany.

Millipore®

Preparation, Separation, Filtration & Monitoring Products

# Extractables and Leachables Validation Services

## An easier way to confirm product contact materials are safe for drug production.

Filters, containers and other plastic and elastomeric materials are used throughout biomanufacturing. When in direct contact with a biopharmaceutical product, they can leach chemical compounds which may present a safety risk to patients. It is your responsibility as a drug manufacturer to utilize a well-characterized chemical profile of the single-use system to effectively conduct a business and patient safety assessment.

Our Validation Services can provide the support you need to assess the potential impact of extractables and leachables.

**Extractables**

Compounds that can be extracted from plastic or elastomeric materials in various solvents under aggressive conditions

**Leachables**

Compounds that can leach from plastic or elastomeric materials into drug product under normal use conditions

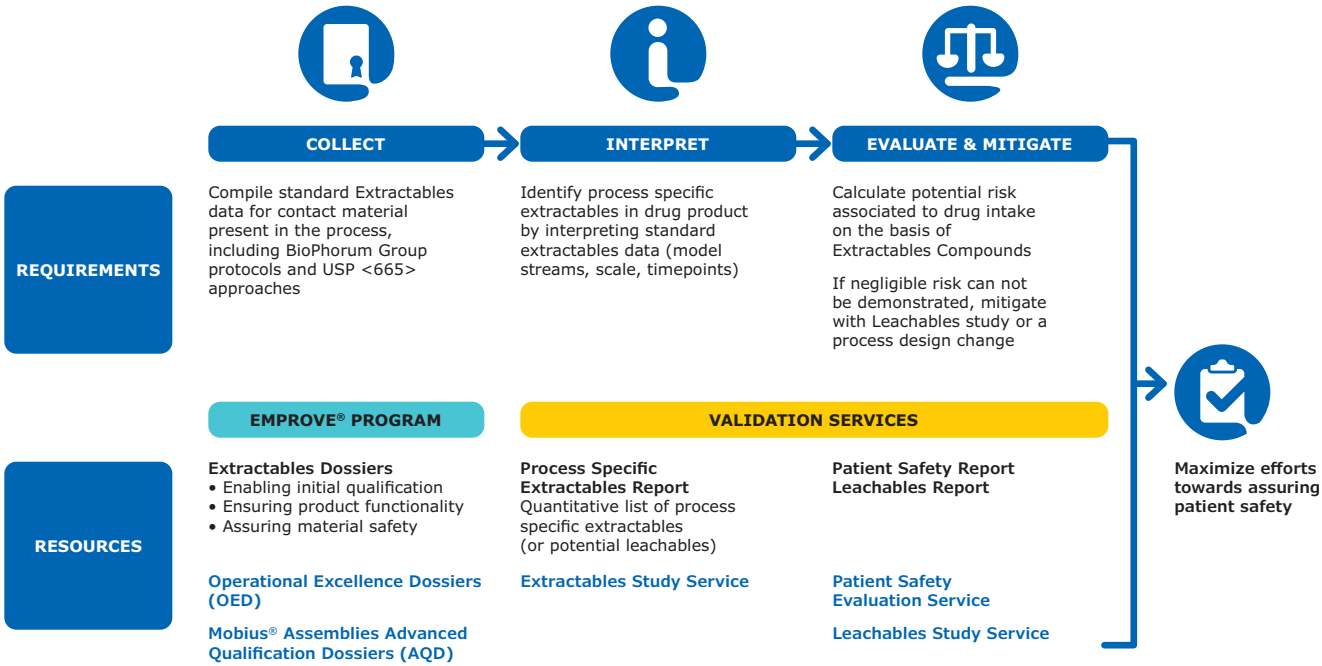
**Patient Safety Evaluation**

# Access to Standard Extractables Data

## Emprove® Single-Use & Filtration Dossiers

The Emprove® Program covers 400 raw and starting materials, and multiple product families including filters and single-use components. Each product portfolio is supported with Emprove® Dossiers which provide comprehensive documentation and testing information. For extractables, the testing is aligned with the Biophorum industry protocol and the USP <665> compendial standard. This information can help you manage risk and improve your manufacturing processes.

These dossiers enable you to quickly **collect** standard extractables information on our products, enabling you to perform a risk assessment and patient safety evaluation. Our Validation Services team can provide support to **interpret** the data specific to your process, **evaluate** potential impact and help **mitigate** identified risks.



# Unparalleled support

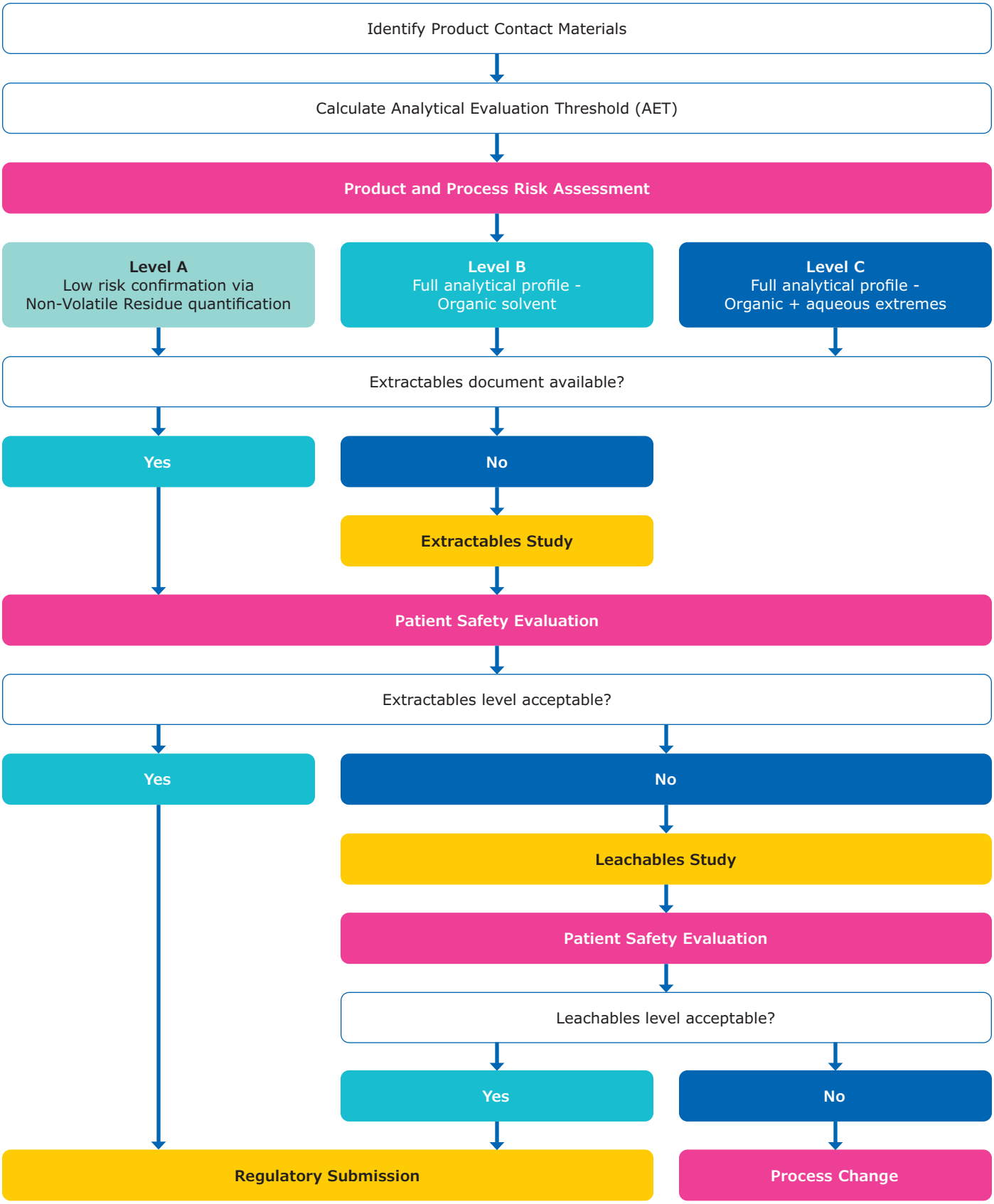
## from our lab to yours

We can guide you through an extractables and leachables risk-based assessment to meet regulatory expectations. These may include:

- Risk Level Assessment & Consultancy
- Extractables Data Package
- Extractables Safety Evaluation Report
- Leachables Study
- Leachables Safety Evaluation Report
- Safety Assessments Provided by Our In-house Toxicologists

To assess the overall risk of your single-use/filtration system, we use our in-depth product knowledge to prepare a customized data package based on your process conditions.

# Industry & Regulatory Guidance for Extractables & Leachables Evaluation



## Our Approach and Services

| | |
|---|---|
| • Review product and manufacturing process to determine level of risk to patient safety | **Risk Level Assessment & Consultancy** |
| • Validation Services Extractables Data Report<br>• Emprove® Program OED Extractables Report | **Extractables Data Packages** |
| • Extractables Data Report<br>• Patient Safety Evaluation Report | **Extractables Safety Evaluation** |
| • Leachables Study<br>• Customized Mitigation Study | **Leachables Data Packages** |
| • Leachables Data Report<br>• Patient Safety Evaluation Report | **Leachables Safety Evaluation** |

# The Risk-Based approach

## Risk Level Assessment & Consultancy

Our experienced project managers will work closely with you to conduct a step-by-step risk assessment:

- Intended use in process
- Compatibility of the material with process fluids
- Exposure temperature, duration
- Contact surface area
- Pre-treatment steps
- Dilution ratio

## Extractables Data Package

Our team will compile the Extractables Data Package for you, leveraging data from:

- The Emprove® Program Operational Excellence Dossiers which provide standard extractables data for contact materials in the process.
- A process specific extractables test or, if available, existing extractables data. This includes:
  - Rationale for selected analytics
  - Selection of model solvent(s) based on customer risk level
  - Materials, test procedures, analytical methods (NVR, HPLC-UV/MS, GC-MS, ICP-MS)

## Patient Safety Evaluation with Extractables Data

Using the extractables data package, a toxicologist will help determine the risk of your single-use system to patient safety based on the maximum dosage of potential leachables from extractables data. The outcome will either:

- Confirm the suitability of the single-use system for your manufacturing process, or
- Highlight the need for further evaluation which may result in a mitigation action, process change or leachables study to generate process specific data.

## Leachables Data Package

Before leachables testing, we will conduct feasibility to verify that the target extractable compounds can be identified through the product formulation. Based on feasibility testing either product, placebo or modified product will be used for leachables testing under actual process conditions.

## Patient Safety Evaluation with Leachables Data

To assess the safety of the single-use/filtration system, our toxicologist will use leachables data and patient exposure information. The outcome will either:

- Confirm the suitability of the single-use system for your manufacturing process, or
- Highlight the need for further evaluation which may result in a mitigation action or a need for a process change

### References


- Validation Services for Mobius® Single-Use Systems Technical Brief, MK_TB7884EN
- Biophorum Best Practices Guide for Extractables Testing of Polymeric Single use Components used in Biopharmaceutical Manufacturing, 2020
- USP <665> Plastic Components and Systems Used to Manufacture Pharmaceutical Drug Products and Biopharmaceutical Drug Substances and Products, 2021
- USP <1665> Characterization and Qualification of Plastic Components and Systems Used to Manufacture Pharmaceutical Drug Products and Biopharmaceutical Drug Substances and Products, 2022

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## Discover an Easier Way with Validation Services

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