Extractables & Leachables Analysis

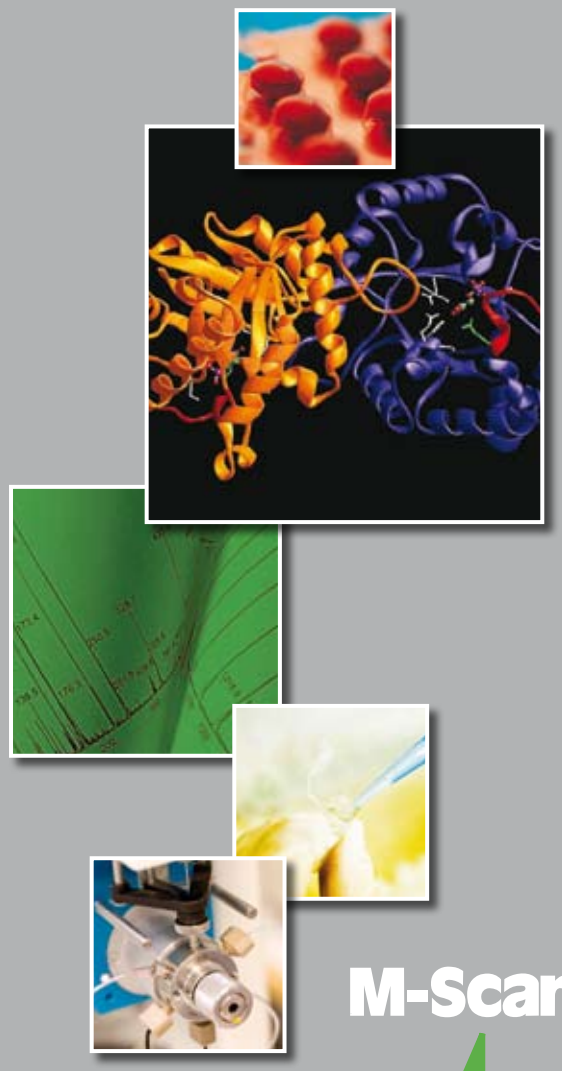
M-Scan has developed mass spectrometry based validated methods for the analysis of plasticisers and leachables from rubber seals, tubing and containers, as well as analysis methods for other extractables:

- Plasticisers are analysed by freeze drying and solvent extraction gas chromatography-mass spectrometry (GC-MS).
- Semi-Volatile Organic Compounds are analysed by solvent extraction GC-MS.
- Detergents:
  - Non-ionic detergents are analysed by positive ion matrix-assisted laser desorption time-of-flight mass spectrometry (MALDI-TOF-MS), or by freeze drying followed by positive ion electrospray mass spectrometry (ES-MS).
  - Anionic and Cationic detergents are analysed by freeze drying followed by negative ion and positive ion ES-MS.
- Oligomeric and Polymeric Species are analysed by freeze drying followed by direct Evolved Gas Analysis-Mass Spectrometry (EGA-MS).
- Residual Solvents are covered by the guidelines in ICH Topic Q3C (See over).
- Adsorbed protein and peptide products adhering to the surface of the container can be analysed by a determination of the amino acid concentration on a known area of the empty container.
- TOC is a quick, accurate and inexpensive screening protocol for contamination validation and for determining the efficiency of cleaning protocols to CFR Title 21 CFR 211.67:
  - It can be utilised in conjunction with both CIP (cleaning in place) and COP (cleaning out of place).
  - Measurement options include; Total Carbon - TC (measurement range of 0~3000mg/L), Inorganic Carbon – IC (0~2500mg/L), Total Organic Carbon – TOC, and Non-Purgeable Organic Carbon – NPOC.
- Samples may be run under full GLP/GMP protocols if required.

Areas of application:

- Pharmaceutical Industry - ICH Topic Q6A requires the determination of the level of extractables and leachables from containers and closure systems. Development and stability data should demonstrate that extractables from container/ closure systems are consistently below levels that are acceptable and safe.
- Cleaning protocols for pharmaceutical manufacturing equipment according to CFR Title 21 Part 211.67.
- Medical Devices.
- Food Industry.

Expert Analytical Services



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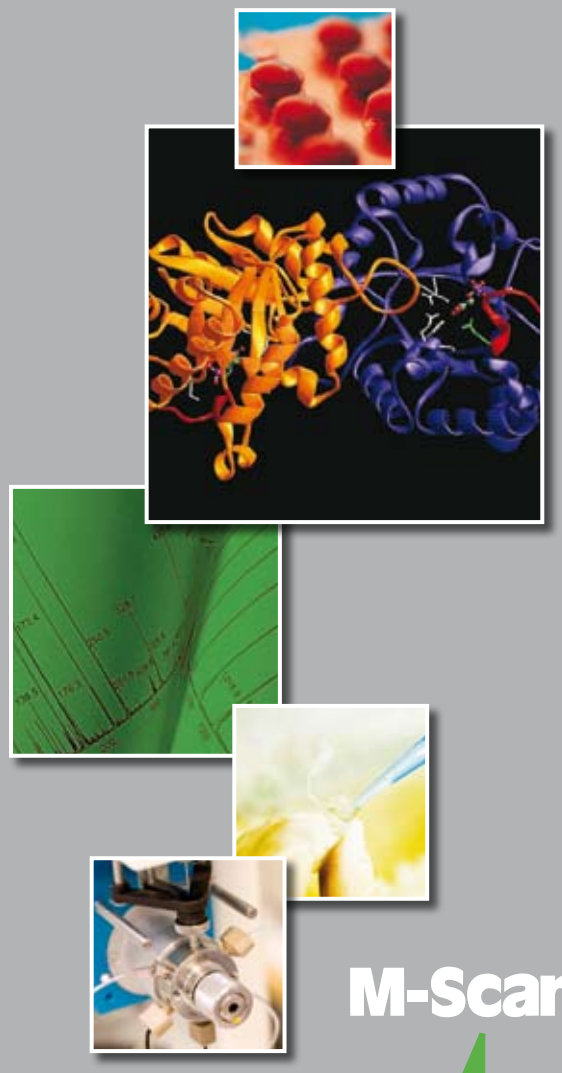
Determination of Solvent Residues in Medicinal Products

In Accordance with ICH Guidelines

The ICH Guidelines for the registration of medicinal products require, under ICH Q3C, 'testing to be performed for residual solvents when production or purification processes are known to result in the presence of such solvents'. The Guidelines set criteria for analytical methods, used to identify and quantify residual solvents, and provide acceptable concentration limits. M-Scan offers analytical expertise in the detailed identification and quantification of residual solvents in medicinal products, using proven robust techniques:

- M-Scan's GC-MS methods for analysis of liquid products offer improved sensitivity and specificity over GC alone.
- Thermal Desorption GC-MS of solid products also offers improved sensitivity over traditional Headspace GC-MS methods.
- Quantitative test or Limit Test of Class 1 solvents (solvents to be avoided).
- Identification and quantification of Class 2, 3 solvents and 'Solvents without adequate Toxicological Data'.
- Quantification of individual solvent residues by reference to an appropriate external standard.
- Expert inspection of mass spectra, mass chromatograms and GC retention data identifies residues when library matching software fails.
- Initial Pilot Study will optimise in-house methods for each new product, enabling subsequent samples to be run by the optimum method and allowing a GLP/GMP protocol to be produced, if required.
- Method validation according to ICH Q2A/Q2B can be performed.
- Samples may be run under full GLP/GMP protocols if required.

Expert Analytical Services



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