CONFIRMING THE NATURE AND THE AMOUNT OF DIOXINS
BY GC TRIPLE QUADRUPOLE MASS SPECTROMETRY

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Following Regulation EU 252/2012 it is allowed to perform screening and quantitative measurements for dioxin analysis on low resolution mass spectrometers instead of high resolution mass spectrometry if you can show the compliance with some analytical criteria. The most important ones are:
- Each group requires at least one $^{13}$C-labelled homologue per group of tetra- to octachlorinated PCDD/PCDF.
- Recovery of internal standards has to be between 30% and 140% for screening methods.
- Separation of the isomers 1,2,3,4,7,8 and 1,2,3,6,7,8-HxCDF has to be sufficient (<25% overlay peak to peak).
- The calibration curve has to cover the relevant concentrations starting from the level of detection.

Additionally, with Regulation EU 589/2014 method requirement for confirmation of dioxins, and related compounds have been laid down. This allows the use of low resolution mass spectrometers instead or in parallel to high resolution mass spectrometry for the confirmation of dioxins.
Requirements for the future have been agreed by a working group formed by experts from the national reference laboratories in the EU and the EU reference laboratory in Freiburg, Germany. These analytical criteria have already been described in Organohalogen Compounds 74, 156-159 (2012). The requirements are:
- Unit resolution for both analytical Quadrupoles
- Ion ratio tolerance <15%
- At least two significant precursor with one significant product ion each

Based on data from reference material in different matrices we are going to show, how modern high precision Triple Quadrupole mass spectrometers perform in these tasks. The compliance with all requirements is going to be shown on samples from food, feed and environmental with certified reference material provided by the Institute for Reference Materials and Measurements (IRMM). Pitfalls and possibilities are covered in this overview.