

# ISO 21675:2019-10 (E)

## Water quality - Determination of perfluoroalkyl and polyfluoroalkyl substances (PFAS) in water - Method using solid phase extraction and liquid chromatography-tandem mass spectrometry (LC-MS/MS)

---

### Contents

	Page
Foreword .....	v
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions .....	1
4 Principle .....	2
5 Interferences .....	3
5.1 Interferences with sampling and extraction .....	3
5.2 Interferences with LC-MS/MS .....	4
6 Reagents .....	4
7 Apparatus .....	7
8 Sampling .....	8
9 Procedure .....	8
9.1 Solid-phase extraction .....	8
9.1.1 General .....	8
9.1.2 Sample preparation .....	8
9.1.3 Conditioning of the solid-phase extraction material .....	9
9.1.4 Sample extraction .....	9
9.1.5 Elution .....	9
9.2 LC-MS/MS operating conditions .....	10
9.3 Blank determination .....	12
9.4 Identification .....	12
10 Calibration .....	13
10.1 General requirements .....	13
10.2 Calibration using an external standard .....	13
10.3 Calibration using an internal standard .....	14
11 Calculation .....	15
11.1 Use of a calibration curve to determine concentration .....	15
11.2 Calculation of concentration using calibration with external standards .....	15
11.3 Calculation of concentration using calibration with internal standards .....	16
11.4 Treatment of results outside the calibration range .....	16
12 Determination of analyte recovery .....	16
12.1 Recovery .....	16
12.2 Recovery of internal standards .....	17
13 Expression of results .....	18
14 Test report .....	18

<b>Annex A (informative) Examples of suitable sorbents .....</b>	<b>19</b>
<b>Annex B (informative) Examples of suitable LC columns .....</b>	<b>20</b>
<b>Annex C (informative) Examples of suitable LC-MS/MS conditions .....</b>	<b>21</b>
<b>Annex D (normative) Filtration and extraction of suspended matter in the sample .....</b>	<b>25</b>
<b>Annex E (informative) Examples of chromatographic separation of individual linear and branched PFAS isomers .....</b>	<b>27</b>
<b>Annex F (informative) Rapid method by direct injection .....</b>	<b>31</b>
<b>Annex G (informative) Rapid method by online solid phase extraction LC-MS/MS .....</b>	<b>32</b>
<b>Annex H (informative) Performance data by DIN 38407-42 for selected PFAS .....</b>	<b>35</b>
<b>Annex I (informative) Performance data .....</b>	<b>37</b>
<b>Bibliography .....</b>	<b>43</b>