DIN EN ISO 3170:2025-12 (E)

Hydrocarbon Liquids - Manual Sampling (ISO 3170:2025)

Contents

Page

Foreword ..... **vi**

Introduction ..... **vii**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **1**

4 Safety **5**
4.1 General 5
4.2 Safety aspects of equipment 6
4.3 Safety at sampling points 6
4.4 Entry into enclosed (confined) spaces 7
4.5 Electrical safety 8
4.5.1 Static electricity 8
4.5.2 Electronic and electrical equipment 8

5 Sampling **8**
5.1 General 8
5.2 Typical locations from where samples are drawn 9
5.2.1 Tank sampling 9
5.2.2 Line sampling 10
5.3 Restricted opening/vapour trap sampling 10
5.4 Representative samples 10
5.5 Homogeneity 10

6 Equipment **11**
6.1 General 11
6.2 Types of tank samplers 11
6.2.1 General 11
6.2.2 Spot samplers 11
6.2.3 Zone samplers/flow-through samplers 11
6.2.4 Running samplers 11
6.2.5 All-level samplers 12
6.2.6 Bottom samplers 13
6.2.7 Dead bottom samplers 13
6.2.8 Residue samplers (sediment samplers) 13
6.3 Samplers used for open sampling methods in tanks 13
6.3.1 General 13
6.3.2 Sampling can/thief 14
6.3.3 Sampling cage and bottle 14
6.3.4 Dead bottom sampler 16
6.3.5 Zone or core sampler 18
6.4 Samplers used for restricted and closed sampling methods in tanks 21
6.4.1 General 21
6.4.2 Sampler for vapour pressure analysis 23
6.4.3 Vapour control valves 23
6.5 Other sampling devices 23
6.5.1 Tank side samplers 23
6.5.2 Pipeline samplers 23
6.5.3 Drum samplers 24
6.5.4 Sludge/sediment samplers 25

7 Sample container **28**
7.1 General container design 28
7.2 Sample container material and type 28
7.2.1 General 28
7.2.2 Glass bottle 28
7.2.3 Plastic container 29
7.2.4 Metal cans 29
7.3 Container closures 29

8 Procedures **30**
8.1 General sampling practices 30
8.2 General principles of sampling 30
8.3 Tank sampling procedures 31
8.3.1 Shore tank sampling 31
8.3.2 Sampling from ships 35
8.4 Procedure for manual sampling on pipeline 38
8.4.1 General 38
8.4.2 Spot sampling of high vapour pressure liquids 38
8.5 Sampling from railcars 44
8.6 Sampling from road tankers 44
8.7 Sampling from drums or intermediate bulk containers 45
8.7.1 General 45
8.7.2 Tube sampling from drums 45
8.7.3 IBC sampling 45
8.7.4 Pump sampling 46
8.7.5 Batch sampling 46
8.8 Package sampling 46
8.8.1 Statistical aspects of sampling packages 46
8.8.2 Acceptable quality limit 47
8.8.3 Inspection level 47
8.8.4 Sampling plan 47
8.8.5 Procedures for sampling packages 50
8.9 Sampling from dispensers (retail) 50

9 Requirements for specific products **51**
9.1 General 51
9.2 Crude oil 51
9.3 Naphtha, gasoline and other volatile liquid 52
9.4 Aviation fuels 52
9.5 Distillate fuels (excluding jet fuel) 53
9.6 Residual fuel oil (including marine bunker fuels) 54
9.6.1 Fuel oil 54
9.6.2 Marine bunker fuel (residual fuel and marine distillates) 54
9.7 Bitumen 55
9.8 Requirements for sampling for microbiological assay 55
9.8.1 General 55
9.8.2 General recommendations for sampling fuel facilities 55
9.8.3 Tank water phase sample 55
9.8.4 Bulk fuel phase sample 55
9.8.5 Sampling procedure 56
9.8.6 Monitoring regimes for terminals and distribution systems 56

10 Sample handling **57**
10.1 General 57
10.2 Sample transfer 57
10.3 Labelling 57
10.4 Sample transportation 58
10.5 External influences 58
10.5.1 General 58
10.5.2 Temperature 58
10.5.3 Light 59
10.5.4 Time 59
10.5.5 First test requirements 60
10.6 Homogenizing samples 60
10.6.1 General 60

10.6.2 None (no mixing) 60
10.6.3 Shaking 60
10.6.4 Power mixers 60
10.7 Verification of mixing efficiency 62
10.7.1 General 62
10.7.2 Homogeneous liquids 62
10.7.3 Non-homogeneous liquids 62
10.7.4 Mixing efficiency verification test for non-homogeneous oils (injection/recovery test) 62
10.8 Selection of sample mixing method 63
10.9 Compositing samples 64
10.10 Retained samples 64
Bibliography **65**