DIN EN ISO 8311:2014-03 (E)

Refrigerated hydrocarbon and non-petroleum based liquefied gaseous fuels - Calibration of membrane tanks and independent prismatic tanks in ships - Manual and internal electro-optical distance-ranging methods (ISO 8311:2013)

Contents

Page

Foreword 3

Introduction 4

1 Scope 5

2 Normative references 5

3 Terms and definitions 5

4 Precautions 7
4.1 General 7
4.2 Ship's condition during calibration 7
4.3 Tank distortion 7
4.4 Comparison with drawings 8
4.5 Measurements by measuring tape 8
4.6 Measurements by electro-optical distance-ranging (EODR) instrument 8
4.7 Condition of membrane 9
4.8 Safety precautions for work in membrane tanks 9

5 Equipment 9

6 Determination of measuring points 10

7 Calibration by manual method 10
7.1 General 10
7.2 Tank length measurement 11
7.3 Tank width measurement 13
7.4 Tank height measurement 16
7.5 Measurement of bottom undulation and gauge reference height 18
7.6 Correction for temperature 19

8 Calibration by electro-optical distance-ranging (EODR) method 20
8.1 General 20
8.2 Setting up of EODR instrument 20
8.3 Calibration procedure 21

9 Additional measurements 23
9.1 Location of level gauge 23
9.2 Deadwood 23

10 Calculation 23
10.1 General 23
10.2 Calculation of tank volume 24
10.3 Effect of bottom undulation 24
10.4 Area of chamfer portion 24
10.5 Trim corrections 25
10.6 List corrections 25
10.7 Combined trim and list corrections 25

10.8 Correction for tank shell expansion or contraction 25

11 Report and tables 26

12 Recalibration 27

Annex A (informative) Uncertainty associated with tank calibration 28

Annex B (informative) Example of tank capacity table (Tank No. 3) 40

Annex C (informative) Example of trim correction table (Tank No. 1) 42

Annex D (informative) Example of list correction table (Tank No. 1) 44

Bibliography 46