

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