

ISO 13705:2006-11 (E)

Petroleum, petrochemical and natural gas industries - Fired heaters for general refinery service

Contents		Page
Foreword		v
Introduction		vi
1	Scope	1
2	Normative references	1
3	Terms and definitions	4
4	General	11
4.1	Pressure design code	11
4.2	Regulations	11
4.3	Heater nomenclature	11
5	Proposals	15
5.1	Purchaser's responsibilities	15
5.2	Vendor's responsibilities	15
5.3	Documentation	15
5.4	Final records	17
6	Design considerations	17
6.1	Process design	17
6.2	Combustion design	18
6.3	Mechanical design	18
7	Tubes	19
7.1	General	19
7.2	Extended surface	20
7.3	Materials	21
8	Headers	21
8.1	General	21
8.2	Plug headers	22
8.3	Return bends	23
8.4	Materials	23
9	Piping, terminals and manifolds	24
9.1	General	24
9.2	Allowable movement and loads	25
9.3	Materials	27
10	Tube supports	27
10.1	General	27
10.2	Loads and allowable stress	28
10.3	Materials	29
11	Refractories and insulation	30
11.1	General	30
11.2	Brick and tile construction	31
11.3	Castable construction	32

11.4	Ceramic-fibre construction	32
11.5	Multi-component lining construction	34
11.6	Materials	34
12	Structures and appurtenances	35
12.1	General	35
12.2	Structures	35
12.3	Header boxes, doors and ports	36
12.4	Ladders, platforms and stairways	36
12.5	Materials	37
13	Stacks, ducts and breeching	38
13.1	General	38
13.2	Design considerations	38
13.3	Design methods	39
13.4	Static design	40
13.5	Wind-induced vibration design	41
13.6	Materials	42
14	Burners and auxiliary equipment	42
14.1	Burners	42
14.2	Sootblowers	47
14.3	Fans and drivers	47
14.4	Dampers and damper controls for stacks and ducts	47
15	Instrument and auxiliary connections	48
15.1	Flue gas and air	48
15.2	Process fluid temperature	49
15.3	Auxiliary connections	49
15.4	Tube-skin thermocouples	50
15.5	Access to connections	50
16	Shop fabrication and field erection	50
16.1	General	50
16.2	Structural-steel fabrication	51
16.3	Coil fabrication	52
16.4	Painting and galvanizing	53
16.5	Refractories and insulation	53
16.6	Preparation for shipment	54
16.7	Field erection	55
17	Inspection, examination and testing	55
17.1	General	55
17.2	Weld examination	55
17.3	Castings examination	56
17.4	Examination of other components	57
17.5	Testing	58
	Annex A (informative) Equipment data sheets	60
	Annex B (informative) Purchaser's checklist	89
	Annex C (informative) Proposed shop-assembly conditions	93
	Annex D (normative) Stress curves for use in the design of tube-support elements	95
	Annex E (normative) Centrifugal fans for fired-heater systems	111
	Annex F (normative) Air preheat systems for fired-process heaters	128
	Annex G (informative) Measurement of efficiency of fired-process heaters	186

Annex H (informative) Stack design253
Bibliography263