ISO 5149-2:2026-11 (E)

Refrigerating systems and heat pumps - Safety and environmental requirements - Part 2: Design, construction, testing, marking and documentation

Contents

Page

Foreword v

Introduction vi

1 Scope 1

2 Normative references 1

3 Terms and definitions 2

4 General requirements 3

5 Requirements for components and piping 3
5.1 General 3
5.2 Specific requirements for particular components 4
5.2.1 Piping joints 4
5.2.2 Fixed refrigerant detection systems 4
5.3 Materials 5
5.3.1 Cast iron and malleable iron 5
5.3.2 Steel, cast steel, carbon steel and low-alloy steel 5
5.3.3 High-alloy steel 6
5.3.4 Stainless steel 6
5.3.5 Copper and copper alloys 6
5.3.6 Aluminium and aluminium alloys 6
5.3.7 Magnesium and magnesium alloys 6
5.3.8 Zinc and zinc alloys 6
5.3.9 Soldering alloys 6
5.3.10 Brazing alloys 6
5.3.11 Tin and lead-tin alloys 6
5.3.12 Gasket and packing materials 7
5.3.13 Glass 7
5.3.14 Asbestos 7
5.3.15 Plastics and elastomers 7
5.4 Testing 7
5.4.1 General 7
5.4.2 Strength-pressure test 7
5.4.3 Tightness test 8
5.5 Marking and documentation 9
5.5.1 Marking 9
5.5.2 Documentation 9
5.5.3 Fusible plugs 9

6 Requirements for assemblies 10
6.1 General 10
6.2 Design and construction 10
6.2.1 General 10
6.2.2 Pressure requirements 10
6.2.3 Piping and fittings 12
6.2.4 Shut-off devices 17
6.2.5 Setting of protection devices 17
6.2.6 Safety switching devices for limiting the pressure 18

6.2.7 Size calculations for pressure relief devices 18
6.2.8 Discharge piping from pressure relief devices 19
6.2.9 Application of the protection devices 19
6.2.10 Indicating and measuring instruments (monitoring) 23
6.2.11 Electrical requirements 24
6.2.12 Protection against extreme temperature surfaces 24
6.2.13 Protection against moving parts 24
6.2.14 Safe handling of equipment 24
6.2.15 Standstill conditions during transportation 24

6.2.16 Protection against explosion hazards 24
6.2.17 Requirements for class IV ventilated enclosures 26
6.3 Testing 26
6.3.1 Tests 26
6.3.2 Strength-pressure test 27
6.3.3 Tightness test 27
6.3.4 Test of the complete installation before putting it into operation 29
6.4 Marking and documentation 30
6.4.1 General 30
6.4.2 Marking 30
6.4.3 Documentation 31

Annex A (informative) Checklist for external visual inspection of the refrigerating system 34

Annex B (normative) Additional requirements for refrigerating systems and heat pumps with ammonia (NH3) 35

Annex C (normative) Determination of category for assemblies 37

Annex D (normative) Requirements for intrinsic safety test 42

Annex E (informative) Examples of arrangements of pressure relief devices in refrigerating systems 44

Annex F (informative) Stress corrosion cracking 49

Annex G (informative) Potential hazards for refrigerating systems 52

Bibliography 54