THE MINISTRY OF ENVIRONMENTAL PROTECTION, PHYSICAL PLANNING AND CONSTRUCTION

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Pursuant to Article 19 of the Act on Physical Planning and Construction (Official Gazette 76/07), the Minister of Environmental Protection, Physical Planning and Construction hereby issues the

TECHNICAL REGULATION

ON HEATING AND COOLING SYSTEMS IN BUILDINGS

I GENERAL PROVISIONS

Article 1

This Technical Regulation (hereinafter referred to as: the Regulation), within compliance with the essential requirements for buildings, prescribes the technical characteristics of heating and cooling systems in buildings (hereinafter referred to as: the systems), as well as the requirements for design, construction, usability, maintenance and other system requirements.

Article 2

The design, construction, maintenance and manner of buildings' use shall be such as to comply with the requirements prescribed pursuant to this Regulation.

Article 3

(1) This Regulation shall not apply to:
– cleanrooms (such as operating halls, areas for testing medicinal products),
– laboratories,
– single-purpose shelters, and
– garages.
(2) Buildings and areas that require a higher level of comfort and for which it is necessary to, along with heating and cooling systems, implement systems that ensure chemical and mechanical air cleanliness, prescribed noise level and monitoring of the degree of relative humidity pursuant to special regulations, shall be the following:
– congress halls,
– concert halls,
– theatres,
– cinemas,
– museums,
– business buildings without the option of opening windows,
– hotels with the capacity of 100 or more guest rooms,

– sports halls, except those in schools,
– enclosed swimming pools.
(3) The provision of paragraph 2 of this Article shall also refer to other buildings and areas for which a higher level of comfort is prescribed by a special regulation adopted pursuant to the Act on Physical Planning and Construction.

Article 4

The particular terms used in this Regulation have the following meaning:
– *heating system* – means the system used for heating a building, several rooms or just one room in a building,
– *cooling system* – means the system used for cooling a building, several rooms or just one room in a building,
– *VRV – systems* – are variable refrigerant volume systems,
– *SPLIT – systems* – are cooling or cooling/heating systems with one external unit and one or more internal units.

Article 5

Regarding the heating and cooling in buildings, compliance with the essential requirements for a building shall be achieved with an adequate system which has the technical characteristics and meets the requirements prescribed by this Regulation.

Article 6

(1) Media that are used and define a heating system are:
– solid fuels,
– water,
– ethylenglycol – water,
– oil,
– gas,
– electricity,
– environmentally acceptable hydrocarbons.
(2) Considering the structure and installation of heating bodies, heating systems are classified into:
– radiator heating systems,
– panel heating systems,
– system of pipe registers,
– floor heating systems,
– valve convector systems with parapet, ceiling and under-ceiling installation – two-pipe and four-pipe,
– SPLIT – systems,
– VRV – systems,
– fan-heating systems including air curtains,
– fireplaces,
– solid fuel heaters.
(3) Pipe registers for installation may be:
– floor,
– ceiling,
– wall.

(4) Water heating systems are classified into:
– low-temperature heating with initial duct temperature t ≤ 40°C
– warm water heating t ≤ 90°C
– hot water heating t > 90°C
(5) Media that are used and define a cooling system are:
– water,
– ethylenglycol – water,
– environmentally acceptable hydrocarbons.
(5) Considering the structure and installation of the cooling bodies, cooling systems are classified into:
– valve convector systems with parapet, ceiling and under-ceiling installation,
– systems of pipe registers – cool ceilings.
(6) Water cooling systems are classified into:
–supercooled water cooling t = 12/16°C,
–supercooled water cooling t = 16/20°C.
(7) Ethylenglycol – water mixture cooling systems are classified into:
– cooling with mixture temperature t = 12/16°C,
– cooling with mixture temperature t = 16/20°C.
(8) Cooling systems with environmentally acceptable hydrocarbons are classified into:
– SPLIT – systems,
– VRV – systems.
(9) Systems with environmentally acceptable hydrocarbons may have a reversible heating/cooling function (SPLIT and VRV – systems).
(10) VRV – systems may, except the heating/cooling process, allow simultaneous heating and cooling of different spaces in a building.

Article 7

(1) A construction or other product may be installed into the systems or a building if it complies with the requirements of special regulations and if it is properly labelled and has an issued certificate on conformity pursuant to a special regulation.
(2) Construction or other products used to construct the systems shall be mutually adjusted in a manner that, after the construction of the systems, ensures compliance with the requirements prescribed pursuant to this Regulation.

Article 8

The systems shall have the technical characteristics and comply with the other requirements prescribed by this Regulation.

II TECHNICAL CHARACTERISTICS OF THE SYSTEMS

Article 9

(1) Technical characteristics of heating and cooling systems shall be such as to sustain all effects of usual use of a building during the lifetime of the building in which they have been installed under the prescribed or designed system construction and maintenance in the following manner:
– in the case of fire, to prevent spreading of fire within the building or onto neighbouring buildings;

– that the building meets the prescribed temperature conditions and the systems prevent threats to the environment from releasing hazardous gases, vapours and other harmful substances, as well as the pollution of water, air and soil,
– to avoid potential injury of the building's users which could occur due to burns, mechanical impacts or electric shock,
– that the level of noise, which is the result of the system operation, is at the level prescribed by a special regulation that poses no threat to health and ensures night time peace and satisfactory conditions for rest and work, and prevents noise from spreading between individual spaces in the building or onto neighbouring buildings,
– to prevent transfer of the system vibrations to the building,
– to ensure rational energy use in correspondence with specific climatic data by making the energy consumption during the use of heating and cooling systems equal to the value prescribed by a special regulation or lower, while simultaneously providing satisfactory temperature conditions to the persons residing in the building as prescribed pursuant to a special regulation.
(2) The technical characteristics referred to in paragraph 1 of this Article shall be accomplished by the design and construction of the systems in line with the provisions of this Regulation.
(3) Preservation of the technical characteristics referred to in paragraph 1 of this Article shall be accomplished by the maintenance of the systems in line with the provisions of this Regulation.

Article 10

If the systems have the technical characteristics prescribed in Article 9 paragraph 1 of this Regulation, it shall be considered that a building meets the essential requirements relating to: fire protection; hygiene, health and environmental protection; safety in use; protection against noise, energy economy and heat retention concerning the building heating and cooling processes.

Article 11

Technical characteristics of the systems shall be such as to, in addition to complying with the requirements referred to in this Regulation, also meet the requirements of special regulations concerning compliance with other essential requirements for buildings.

Article 12

After reconstruction of a building that may affect the existing systems that form an integral part of the building, the systems must have the technical characteristics prescribed in Article 9 paragraph 1 and Article 11 of this Regulation.

III. SYSTEM DESIGN

Article 13

(1) For the purpose of construction and operational lifetime of systems, system design shall anticipate all effects on the systems that arise from the method and sequence of the construction, building use requirements and foreseeable environmental effects on the systems and the building.

(2) In line with this Regulation, the design of the systems shall demonstrate that a building will, during the construction and the designed operational lifetime, meet the essential requirements for fire protection; hygiene, health and environmental protection; safety in use; protection against noise, energy economy and heat retention of a building in relation to achieving the relevant temperatures and noise level in building spaces related to the heating or cooling process.
(3) Unless otherwise provided by a special regulation, operational lifetime of the systems referred to in paragraph 1 of this Article shall be at least 25 years.
(4) When additional protection of the systems is required in order to comply with the requirements referred to in this Regulation, such protection shall be considered as an integral part of the technical solution of the systems.

Article 14

(1) The compliance with the essential requirements for noise protection, energy economy and heat retention of a building shall be demonstrated in the main design by thermal, hydraulic and, when necessary, acoustic calculations, calculations of technical characteristics of the systems, proof of energy adequacy of the designed system, selection of adequate components and parts of the system and their position, and the selection of an adequate automatic regulation and control system.
(2) The calculations referred to in paragraph 1 of this Article shall be carried out by applying standardised and suitable calculation procedures while taking into account all relevant parameters.
(3) The calculations shall secure adequate behaviour of the systems during the construction and use of a building considering the reliability of input data and accuracy of the construction of the systems.
(4) The compliance with the essential requirement for fire protection shall be demonstrated in the main design by determining adequate technical characteristics, properties and positioning of the system components and parts in accordance with the prescribed fire protection level.
(5) The compliance with the essential requirement for safety in use and hygiene, health and environmental protection shall be demonstrated in the main design by selecting adequate calculation parameters of physical sizes, determining adequate technical characteristics of the system, components and parts of the system, description of the function and description of implementation of the measures prescribed by special regulations.

Article 15

(1) In system design, Croatian standards and acknowledged rules of technology that refer to the relevant calculation procedures listed in Annex A to this Regulation shall be applied.
(2) The application of other system design rules which differ from the rules set by Croatian standards and acknowledged rules of technology which refer to the relevant calculation procedures listed in Annex A to this Regulation shall also be permitted, provided it is demonstrated that the application of those rules complies with the requirements of this Regulation at least at the level set by those standards.
(3) Annex A referred to in paragraph 1 of this Article shall prescribe the system design procedure in more detail.
(4) By way of derogation from paragraphs 1 and 2 of this Article, calculation of the annual energy requirement for heating and annual energy requirement for cooling of a building shall be carried out in line with a special regulation.

Article 16

(1) The air temperature in heated or cooled spaces shall comply with the values prescribed by a special regulation.
(2) Unless otherwise provided by a special regulation, the prescribed noise level in heated or cooled spaces shall not exceed the values prescribed by the standards referred to in Annex A.

Article 17

(1) The contents of the main design of the building in the part relating to the technical solution of the system and the conditions for its construction and maintenance shall include:
– mechanical engineering design and
– electrical engineering design,
and, where required:
– architectural design,
which need to be mutually adjusted and adjusted with the designs related to the technical solutions of other systems in the building.
(2) The mechanical engineering design of the system, which is an integral part of the main design of the building, shall contain in particular:
1. in the terms of reference:
– primary purpose of the building,
– information on available energy sources only for heating, only for cooling, or for heating/cooling,
– requirements only for heating, only for cooling, or for heating/cooling,
– other requirements which may influence the selection of the design solution.
2. in the technical description:
– description of the system operation, method of installation and use, and description of the energy management process in terms of energy economy,
– impact of the system on the environment (noise, vibrations, pollution, heat return),
– description of the solutions for installation, attachment and suspension on the load-bearing construction of the building,
– conditions for the system maintenance, including the conditions for the disposal of parts of the system after their replacement or partial removal, that must be included in the statement on the performed works and conditions for building maintenance,
– procedures and methods of quality control of the construction and functioning of the system, and test reports.
3. in the calculations (depending on the system):
– thermodynamic calculation of thermal loads of the building (summer/winter),
– calculation of technical characteristics of the system components and parts with the selection procedure,
– calculation and selection of the expansion system,
– calculation of thermal expansions with the plan of sliding and firm points of the hydraulic (pipe) distribution of energy-generating products,
– hydraulic calculation of pipe distribution for the heating or cooling medium,
– where required, acoustic calculation of the system including the impact on the building and the environment and the solution for preventing the transfer of the system vibrations to the building structure,
– balance of the thermal, cooling and electrical energy,
– calculation of the annual thermal energy requirement for heating of the building,
– calculation of the annual thermal energy requirement for cooling of the building.

4. in the control and quality assurance programme:
– the characteristics prescribed for products which are installed into the systems,
– tests and procedures of demonstrating usability of the system components and parts and the system as a whole (pressure and functional trials),
– welding and joining technology including methods for testing welded joints in high buildings,
– conditions for construction and other conditions which must be fulfilled during the construction of the system,
– technological procedure of the construction and installation of components and parts of the system,
– report on balancing the energy distribution by system elements (balancing of the system),
– requirements concerning the frequency of periodic inspections during the system maintenance, review and description of necessary control testing procedures and required results in order to exhibit conformity with the designed characteristics,
– procedure of testing efficiency of the designed and constructed systems.
5. in drawings:
– situation of the building into which the system is installed, prepared on an adequate special geodetic template,
– plans, cross-sections, assemblies and views,
– displays with the exact position of the system and system elements in and outside of the building,
– functional schemes of the system,
– functional scheme of the automatic regulation and control system.
(3) The architectural design in the part relating to the technical solution of the system shall contain in particular:
1. in drawings:
– position of the passages for pipe distribution of energy media in the building,
– position of all system components located on the façade and outside of the building, and the system components located on the roof of the building,
– total height of the building including the system components located on the roof.
(4) In the part of the design relating to the technical solution of the automatic regulation and control system, mechanical engineering design or electrical engineering design shall contain in particular:
1. in the technical description:
– description of the automatic regulation and control system solution,
– description of the management and position of equipment in the building,
– description of the heating or cooling system management in case of fire,
– solution of monitoring the energy distribution and consumption by technological units addressed through the central monitoring system,
– programme for central monitoring of the automatic regulation and control system for the purpose of energy management,
– programme for monitoring the function and deterioration of the system components,
– control of temperature parameters winter/summer.
2. in the control and quality assurance programme:
– characteristics prescribed for products which are installed into the automatic regulation system,
– technological procedure of constructing and installing individual components and elements of the automatic regulation system,
– procedure for trial tests of the automatic regulation system,
– requirements concerning the frequency of periodic inspections during the automatic

regulation system maintenance, review and description of necessary control procedures and testing protocols.
3. in drawings:
– functional schemes of the system including the scheme of the automatic regulation system,
– inter-functional interface of the automatic regulation system components,
– position of the automatic regulation system equipment in the building.

Article 18

(1) The terms of reference referred to in Article 17 paragraph 2 of this Regulation shall be prepared by the investor and signed by the investor and the design engineer.
(2) For technologically demanding buildings identified by a special regulation adopted in line with the Act on Physical Planning and Construction, the mechanical engineering design of the system shall, along with the terms of reference, always contain data from the studies used to determine technological requirements for the building and which served for the drafting of that design.

Article 19

If, in order to comply with the conditions referred to in Article 17 of this Regulation, the system design prescribes the application of the standard referred to in Annex to this Regulation in the manner set by this Annex, it shall be considered that the system complies with the prescribed requirements.

Article 20

The requirements and characteristics of the system components and parts shall be harmonised with the technological and other functional requirements and with other characteristics of the building.

Article 21

(1) Except the conditions prescribed by the provisions of Articles 13 to 20 of this Regulation, a building reconstruction project which affects the technical characteristics of the system shall contain a review of the existing state and information on the established current technical characteristics of the system.
(2) The current technical characteristics of the system shall be established by inspection of the building documentation, tests, control calculations and evaluation of the design engineer by means of investigation of the building.
(3) Where reconstruction of an existing building changes the functional requirements of the existing system, the project providing the technical solution for the building relating to the system shall, in addition to the contents referred to in Article 17 of this Regulation, also contain a detailed description and technical characteristics of the existing state of the building system or the existing construction section in relation to the designed reconstruction of the system.
(4) By way of derogation from paragraph 1 of this Article, for particular types of buildings, if this is prescribed by a special regulation adopted pursuant to the Act on Physical Planning and Construction, a study of the existing state shall be compiled and used as the background for the development of the main design.

IV CONSTRUCTION AND USABILITY OF THE SYSTEMS

Article 22

(1) Construction of buildings into which the systems are installed shall be such that the systems have adequate technical characteristics and comply with the other requirements prescribed by this Regulation, in line with the technical solution of the building and the designed conditions for construction, and so as to ensure the preservation of those characteristics and usability of the building during its lifetime.
(2) During the construction of the systems, the contractor shall be obliged to comply with the design and technical instructions for installation and use of products and the provisions of this Regulation.

Article 23

When taking over a product, the contractor of the system shall be obliged to establish:
– whether the product is delivered with a label in line with a special regulation and whether the information in the accompanying product documentation corresponds to the information on the product label,
– whether the product has been delivered with technical instructions for installation and use in the Croatian language,
– whether the characteristics, including the product's shelf life, and data significant for its installation, use and effect on the characteristics and durability of the system comply with the characteristics and data prescribed by the main design.

Article 24

The established facts referred to in Article 23 shall be recorded pursuant to the special regulation on keeping a construction diary, whereas the accompanying product documentation shall be filed along with the evidence on the product conformity which the contractor must have at the construction site.

Article 25

(1) It shall be prohibited to install a product which:
– is delivered without a label pursuant to a special regulation,
– is delivered without technical instructions for installation and use in the Croatian language,
– does not have the characteristics required by the system design, or whose shelf life has expired, or whose data significant for its installation, use and effect on the characteristics and durability of the system do not comply with the characteristics and data prescribed by the main design.
(2) Installation of products or continuation of works shall be approved by the supervising engineer by an entry in the construction diary pursuant to the special regulation on keeping a construction diary.

Article 26

(1) Construction of the systems shall be such that the systems have the technical characteristics and meet the requirements prescribed by the design and this Regulation.
(2) The conditions for constructing the systems shall be established by the control and quality

assurance programme which is an integral part of the main design of the building, at least in line with the provisions of Annex B to this Regulation.
(3) Insofar as the technical solution of the system or the conditions under which works are performed and other circumstances which may affect the technical characteristics of the systems are such that they are not included in the provisions of Annex B to this Regulation, the control and quality assurance programme shall establish special conditions for construction which meet the requirement referred to in paragraph 1 of this Article.
(4) Annex B referred to in paragraphs 2 and 3 of this Article shall determine the construction and maintenance of the systems in more detail.

Article 27

(1) The systems shall be deemed to have the designed technical characteristics and to be usable provided that:
– the products are installed into the systems in the prescribed manner and have the certificate on conformity issued in line with a special regulation,
– the products installed into the systems have the technical characteristics set by the heating/cooling design,
– the conditions for construction and other circumstances which may affect the technical characteristics of the systems are in compliance with the design requirements,
– the measurements have confirmed the designed space temperature values, for measurements set by the main design of the building,
– the measurements have confirmed that the systems do not generate noise above the designed noise level, for measurements set by the main design of the building,
and provided that the facts referred to in subparagraphs 1 to 5 of this paragraph are supported by records and/or documentation.
(2) The usability of the systems shall be deemed to be demonstrated if the requirements referred to in paragraph 1 of this Article and Article 26 of this Regulation have been met.

Article 28

If it is established that the system does not have the designed technical characteristics, the system shall be harmonised with the requirements set by the design.

V MAINTENANCE OF THE SYSTEMS

Article 29

(1) Maintenance of a system shall, during the lifetime of the system, ensure preservation of its technical characteristics and compliance with the requirements set by the building design and this Regulation.
(2) Maintenance of the system which has been constructed or is being constructed in accordance with prior relevant regulations shall, during the lifetime of the system, ensure preservation of its technical characteristics and compliance with the requirements set by the building design and the regulations in accordance with which that system was designed and constructed.

Article 30

(1) System maintenance shall imply:
– regular system inspections, at intervals and in the manner set by the design, and a written statement by the contractor on the works performed and on the building maintenance conditions,
– extraordinary system inspections after an extraordinary event or upon inspection supervision.
(2) The compliance with the prescribed system maintenance conditions shall be documented and carried out in accordance with the building design and monitoring of the function and deterioration of the system components and:
– reports concerning inspections and tests of the system,
– records of maintenance works.

Article 31

(1) When performing system maintenance and servicing, it shall be permitted to install only construction and other products which meet the requirements set by the design according to which the system was constructed, or those which have more favourable characteristics.
(2) When performing system maintenance, it shall be permitted to use only those construction and other products which meet the prescribed requirements and for which a certificate of conformity pursuant to a special regulation has been issued.
(3) Maintenance of the system in a building or in any other manner shall not jeopardize the designed technical characteristics of the system or affect other technical characteristics of the building.

Article 32

The provisions of this Regulation relating to the construction of the systems shall apply accordingly to the performance of works on the system maintenance.

VI TRANSITIONAL AND FINAL PROVISIONS

Article 33

(1) Annex A and Annex B with their corresponding contents shall be a constituent part of this Regulation.
(2) The minister authorised to adopt this Regulation by a special decision shall, apart from the standards set in the Annexes referred to in paragraph 1 of this Article, identify the standards to which the standards in those Annexes refer as well as other standards, acknowledged rules of technology and rules of profession that are significant for the application of this Regulation. This decision shall be published on the official web pages of the Ministry of Environmental Protection, Physical Planning and Construction.

Article 34

(1) On 31 March 2009, the recognised rules of technology in the part relating to the systems shall cease to have effect, unless otherwise provided by this Regulation.
(2) The main design in which the technical solution of the system has been supplied pursuant to the recognised rules of technology referred to in paragraph 1 of this Article shall be deemed to be a valid document for:
– the commencement of works on buildings with the (gross) construction area of no more than 400 m2 and buildings intended only for agricultural activities with the (gross) construction

area of no more than 600 m2, for which the investor has a valid decision on the construction conditions, if the investor reports the commencement of works no later than 30 September 2009,
– issuing of an approval of the main design or a building permit if the request for issuing that approval or permit together with the main design is submitted no later than 30 September 2009.

Article 35

If technical specifications – Croatian standards or standards to which those standards refer – are not available for the designing of the systems in line with Title III of this Regulation, the provisions of the corresponding recognised rules of technology shall apply which are not contrary to the Act on Physical Planning and Construction (Official Gazette 76/07), this Regulation and the standards to which this Regulation refers, and the establishment of which is the responsibility of the design engineer pursuant to the Act on Physical Planning and Construction.

Article 36

This Regulation shall enter into force on 31 March 2009.

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Zagreb, 22 September 2008

Minister
Marina Matulović Dropulić, m.p.

ANNEX A

SYSTEM DESIGN

A.1. Scope of application

A.1.1. Pursuant to Article 15 of this Regulation, this Annex prescribes the rules for system design.

A.2. Designing and calculation

A.2.1. The Croatian standards referred to in item A.4.1 and the standards to which those standards refer, and the recognised rules of technology referred to in item A.4.2, shall be applied as the basis for the system calculation.

A.3. Technical characteristics of the systems' parts

A.3.1. Technical characteristics of construction products which are integral parts of the systems shall be specified in the design pursuant to the provisions of a special regulation regulating those products.
A.3.2. Technical characteristics of other products which are integral parts of the systems shall

be specified in the design pursuant to the provisions of special regulations regulating those products.

A.4. Standards and recognised rules of technology

A.4.1. Standards for calculation and design
HRN EN 12098-1:2003 – Controls for heating systems – Part 1: Outside temperature compensated control equipment for hot water heating systems (EN 12098-1:1996)
– Controls for heating systems – Part 2: Optimum start-stop control equipment for hot water heating systems (EN 12098-2:2001)
HRN EN 12098-3:2003 – Controls for heating systems – Part 3: Outside temperature compensated control equipment for electrical heating systems (EN 12098-3:2002)
HRN EN 12098-4:2008 – Controls for heating systems – Part 4: Optimum start-stop control equipment for electrical systems (EN 12098-4:2005)
HRN EN 12828:2003 – Heating systems in buildings – Design for water-based heating systems (EN 12828:2003)
HRN EN 12831:2004 – Heating systems in buildings – Method for calculation of the design heat load (EN 12831:2003)
HRN EN ISO 13789:2000 – Thermal performance of buildings – Transmission heat loss coefficient – Calculation method (ISO 13789:1999; EN ISO 13789:1999)
HRN EN 13829:2002– Thermal performance of buildings -- Determination of air permeability of buildings – Fan pressurization method (ISO 9972:1996, modified; EN 13829:2000)
HRN ENV 13154-1:2004 – Data communication for HVAC application – Field net - Part 1: Objectives (ENV 13154-1:2000)
HRN ENV 13154-2:2004 – Data communication for HVAC application – Field net – Part 2: Protocols (ENV 13154-2:1998)
HRN EN 14337:2008 – Heating systems in buildings – Design and installation of direct electrical room heating systems (EN 14337:2005)
HRS CEN/TS 15379:2008 – Building management – Terminology and scope of services (CEN/TS 15379:2006)
HRN EN ISO 16484-2:2004 – Building automation and control systems (BACS) – Part 2: Hardware (ISO 16484-2:2004; EN ISO 16484-2:2004)
HRN EN 378-1:2004 – Refrigerating systems and heat pumps -- Safety and environmental requirements -- Part 1: Basic requirements, definitions, classification and selection criteria (EN 378-1:2000)
HRN EN 378-2:2004 – Refrigerating systems and heat pumps – Safety and environmental requirements – Part 2: Design, construction, testing, marking and documentation (EN 378-2:2000)
HRN EN 378-3:2004 – Refrigerating systems and heat pumps – Safety and environmental requirements – Part 3: Installation site and personal protection (EN 378-3:2000)
HRN EN 378-4:2004 – Refrigerating systems and heat pumps – Safety and environmental requirements – Part 4: Operation, maintenance, repair and recovery (EN 378-4:2000)
HRN EN 1861:2004 – Refrigerating systems and heat pumps – System flow diagrams and piping and instrument diagrams – Layout and symbols (EN 1861:1998)
HRN EN 12263:2004 – Refrigerating systems and heat pumps – Safety switching devices for limiting the pressure – Requirements and tests (EN 12263:1998)
HRN EN 12284:2004 – Refrigerating systems and heat pumps – Valves – Requirements, testing and marking (EN 12284:2003)
HRN EN 13136:2004 – Refrigerating systems and heat pumps – Pressure relief devices and

their associated piping – Methods for calculation (EN 13136:2001)
HRN EN 14511-1:2006 – Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling – Part 1: Terms and definitions (EN 14511-1:2004)
HRN EN 442-1:20XX – Radiators and convectors – Part 1: Technical specifications and requirements (EN 442-1:1995+A1:2003)
HRN EN 13229/corr. 1:2008 – Inset appliances including open fires fired by solid fuels – Requirements and test methods (EN 13229:2001/AC:2006)
HRN EN 13229:2004 – Inset appliances including open fires fired by solid fuels – Requirements and test methods (EN 13229:2001)
HRN EN 13240:2004 – Room heaters fired by solid fuel – Requirements and test methods (EN 13240:2001)
HRN EN 14037-1:2004 – Ceiling mounted radiant panels supplied with water at temperature below 120°C – Part 1: Technical specifications and requirements (EN 14037-1:2003)
HRN EN 13790:2008 – Energy performance of buildings – Calculation of energy use for space heating and cooling (ISO 13790:2008; EN ISO 13790:2008)
HRN EN 416-1:2004 – Single burner gas-fired overhead radiant tube heaters for non-domestic use – Part 1: Safety (EN 416-1:1999+A1:2000+A2:2001+A3:2002)
HRN EN 777-1:2004 – Multi-burner gas-fired overhead radiant tube heater systems for non-domestic use – Part 1: System D, safety (EN 777-1:1999+A1:2001+A2:2001+A3:2002)
HRN EN 777-2:2004 – Multi-burner gas-fired overhead radiant tube heater systems for non-domestic use – Part 1: System E, safety (EN 777-2:1999+A1:2001+A2:2001+A3:2002)
HRN EN 777-3:2004 – Multi- burner gas-fired overhead radiant tube heater systems for non-domestic use -- Part 1: System F, safety (EN 777-3:1999+A1:2001+A2:2001+A3:2002)
HRN EN 777-4:2004 – Multi-burner gas-fired overhead radiant tube heater systems for non-domestic use – Part 1: System H, safety (EN 777-4:1999+A1:2001+A2:2001+A3:2002)
HRN EN 419-1:2004 – Non-domestic gas-fired overhead luminous radiant heaters – Part 1: Safety (EN 419-1:1999+A1:2000+A2:2001+A3:2002)
HRN EN 437:2004 – Test gases – Test pressures – Appliance categories (EN 437:2003)
HRN EN ISO 3740:2001 – Acoustics – Determination of sound power levels of noise sources – Guidelines for the use of basic standards (ISO 3740:2000; EN ISO 3740:2000)
HRN EN ISO 11200:1998 – Acoustics – Noise emitted by machinery and equipment – Guidelines for the use of basic standards for the determination of emission sound pressure levels at a work station and at other specified positions (ISO 11200:1995+Cor 1:1997; EN ISO 11200:1995+AC:1997)
HRN EN ISO 11201:1998 – Acoustics – Noise emitted by machinery and equipment – Measurement of emission sound pressure levels at a work station and at other specified positions – Engineering method in an essentially free field over a reflecting plane (ISO 11201:1995+Cor 1:1997; EN ISO 11201:1995+AC:1997)

A.4.2. Acknowledged rules of technology
Note: the listed standards apply in relation to the selection and dimensioning of the expansion systems
HRN M.E6.203 – Safety requirements for hot water heating installations with distribution water temperature above 110°C and working pressure of up to 0.5 bar
HRN M.E7.201 – Safety technical equipment of hot water heating installations with distribution water temperature of up to 110°C
HRN M.E7.202 – Safety technical equipment of hot water heating installations with distribution water temperature of up to 110°C, up to 360 kW efficiency, with thermostatic control.

ANNEX B

CONSTRUCTION AND MAINTENANCE OF THE SYSTEMS

B.1. Scope of application

B.1.1. Pursuant to Article 26 of this Regulation, this Annex prescribes the technical and other requirements and conditions for system construction, the supervising actions, control procedures and maintenance of the systems, unless otherwise provided by this Regulation.
B.1.2. The technical and other requirements and conditions referred to in item B.1.1 of this Annex shall be determined by, and the construction and maintenance of the systems and control procedures shall be carried out in accordance with the standards referred to in item B.4 of this Annex, with the standards to which those standards refer, with the provisions of this Annex, and with provisions of a special regulation.

B.2. Construction, installation, usability, supervising actions and control procedures at the construction site

B.2.1. Construction and installation
B.2.1.1. The systems in buildings shall be constructed at the construction site according to the designed technical solution, along with the installation of construction and other products which meet the requirements pursuant to the provisions of special regulations regulating those products, according to the technical instructions for construction, installation and use, the standards referred to in item B.4.1, the standards to which those standards refer and the provisions of this Annex.
B.2.1.2. Handling, storage and protection of construction and other products from which the systems are constructed shall be carried out according to the requirements of the technical specifications of construction and other products of the systems, the building design, the provisions of this Annex, and provisions of special regulations.
B.2.1.3. The system contractor shall be obliged to, prior to starting the construction of the system, check if the construction and other products of the system meet the requirements of the building design and whether, during handling and storage of these products, they sustained damage, deformation or other changes which may affect the technical characteristics of the system.
B.2.1.4. Immediately before starting the construction of the system, the supervising engineer shall:
a) check if there is a certificate on conformity in accordance with special regulations for construction and other products installed into the systems and whether the described characteristics comply with the building design requirements,
b) check whether construction and other products are installed in accordance with the building design and/or technical instructions for installation and use of the system, with Annex A to this Regulation, and provisions of special regulations,
c) document the findings of all performed checks by making an entry into the construction diary.
B.2.1.5. After the system construction, the supervising engineer shall check the documentation demonstrating the accuracy of the constructed system according to the building design and document the findings of this check by making an entry into the construction diary.

B.2.1.6. The system contractor shall be obliged to protect the system in a manner as to prevent any damage to the system prior to the beginning of its use or the takeover of the system by the user.
B.2.1.7. Other contractors shall pay attention not to damage the protection referred to in item B.2.1.6, for the purpose of assuring the quality of proper installation and operation of the system during its takeover.
B.2.1.8. The main supervising engineer and supervising engineers shall identify any observed damages and the procedure for their removal.
B.2.2. Usability of the system
B.2.2.1. When demonstrating the usability of the system, the following shall be taken into consideration:
a) entries in the construction diary relating to the characteristics and other information on the construction and other products installed into the system,
b) results of supervising actions and control procedures which must be carried out pursuant to this Annex before installing the construction and other products into the system,
c) proofs of usability (test results, records of the implemented procedures, etc.) which were ensured by the contractor during the system construction,
d) results of the tests determined by the building design or tests carried out in the case of doubt,
e) conditions for construction and other circumstances which, in accordance with the construction diary and other documentation which the contractor must have at the construction site and documentation which the manufacturer of a construction or other product must possess, may affect the technical characteristics of the system.
B.2.2.2. Testing of the system shall be carried out in accordance with the requirements referred to in the main building design which may not be less than the requirements prescribed by item B.3 of this Annex.
B.2.2.3. Testing of the system shall be carried out by appropriate application of the standards referred to in item B.4.2 and the standards to which those standards refer, and the provisions of this Annex and special regulations.

B.3. System maintenance

B.3.1. Actions within the system maintenance shall be carried out pursuant to the provisions of this Annex and the standards to which this Annex refers, and by appropriate implementation of the provisions of Annex A to this Regulation.
B.3.2. Testing of the system during maintenance shall be mandatory for all heating/cooling systems.
B.3.3. The frequency of regular inspections for the purpose of system maintenance shall be carried out in line with the building design requirements, but no less than once a year.
B.3.3.1. The method of carrying out regular inspections shall be determined by the building design and shall include at least:
a) visual inspection,
b) servicing, replacement and cleaning of system parts,
c) control of measurements of the designed temperature and noise parameters, which shall be confirmed by relevant documentation.
B.3.3.2. System inspection shall be carried out in the manner referred to in item B.3.3.1 prior to the initial use of the system and prior to its reuse if the system was not operational for more than 6 months, or unless otherwise provided by a special regulation.
B.3.3.3. Extraordinary system inspection shall be carried out prior to any changes in the system, after each extraordinary event which may affect the technical characteristics of the

system or causes doubt relating to the usability of the system and upon inspection supervision, and it includes system testing by appropriate application of the standards referred to in item B.4.2, the standards to which those standards refer, and the provisions of this Annex and special regulations.

B.3.4. Replacement of system parts shall be carried out in such a manner that those works do not affect the existing technical characteristics of the building.

B.3.4.1. Construction and other products used to replace system parts shall meet the requirements pursuant to the provisions of special regulations regulating those products.

B.3.4.2. Technical instructions for replacing parts of the existing system and the installation of the system parts shall be such that the system after the installation complies with the requirements referred to in this Regulation.

B.3.5. Documentation on the inspections referred to in item B.3.3 and on the installation of system parts referred to in item B.3.4 of this Annex, and any other documentation concerning the system maintenance shall be permanently kept by the building owner.

B.4. Standards

B.4.1. Standards for construction and maintenance of the systems

HRN EN 12170:2004 – Heating systems in buildings -- Procedure for the preparation of documents for operation, maintenance and use – Heating systems requiring a trained operator (EN 12170:2002)

HRN EN 12171:2004 – Heating systems in buildings – Procedure for the preparation of documents for operation, maintenance and use – Heating systems not requiring a trained operator (EN 12171:2002)

HRN EN 12828:2003 – Heating systems in buildings – Design for water-based heating systems (EN 12828:2003)

HRN EN 14336:2005 – Heating systems in buildings – Installation and commissioning of water based heating systems (EN 14336:2004)

HRN EN 14337:2008 – Heating Systems in buildings – Design and installation of direct electrical room heating systems (EN 14337:2005)

HRN EN 378-2:2004 – Refrigerating systems and heat pumps – Safety and environmental requirements – Part 2: Design, construction, testing, marking and documentation (EN 378-2:2000)

HRN EN 378-3:2004 – Refrigerating systems and heat pumps – Safety and environmental requirements – Part 3: Installation site and personal protection (EN 378-3:2000)

HRN EN 378-4:2004 – Refrigerating systems and heat pumps – Safety and environmental requirements – Part 4: Operation, maintenance, repair and recovery (EN 378-4:2000)

HRN EN 1736:2004 – Refrigerating systems and heat pumps – Flexible pipe elements, vibration isolators and expansion joints – Requirements, design and installation (EN 1736:2000)

HRN ENV 12102:2004 – Air conditioners, heat pumps and dehumidifiers with electrically driven compressors – Measurement of airborne noise – Determination of the sound power level (ENV 12102:1996)

HRN EN 12263:2004 – Refrigerating systems and heat pumps – Safety switching devices for limiting the pressure – Requirements and tests (EN 12263:1998)

HRN EN 12284:2004 – Refrigerating systems and heat pumps – Valves – Requirements, testing and marking (EN 12284:2003)

HRN EN 13313:2004 – Refrigerating systems and heat pumps – Competence of personnel (EN 13313:2001)

HRN ENV 12102:2004 – Air conditioners, heat pumps and dehumidifiers with electrically

driven compressors – Measurement of airborne noise – Determination of the sound power level (ENV 12102:1996)

B.4.2. Standards for testing and control of the systems
HRN EN 14336:2005 – Heating systems in buildings -- Installation and commissioning of water based heating systems (EN 14336:2004)
HRN EN 378-2:2004 – Refrigerating systems and heat pumps – Safety and environmental requirements – Part 2: Design, construction, testing, marking and documentation (EN 378-2:2000)
HRN ISO/R 916:2004 – Testing of refrigerating systems (ISO/R 916:1968)
HRN ISO 1996-1:2004 – Acoustics – Description, measurement and assessment of environmental noise – Part 1: Basic quantities and assessment procedures (ISO 1996-1:2003)
HRN ISO 1996-2:2000 – Acoustics – Description and measurement of environmental noise – Part 2: Acquisition of data pertinent to land use (ISO 1996-2:1987+Amd 1:1998)
HRN ISO 1996-3:2000 – Acoustics – Description and measurement of environmental noise – Part 3: Application to noise limits (ISO 1996-3:1987)