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Namakalna tehnika - Namakalne naprave z vrtljivimi in boļ nimi krili - 3. del: Terminologija in razvrģļ anje

Irrigation techniques - Centre pivot and moving lateral systems - Part 3: Terminology and classification

Bewässerungsverfahren - Kreis- und Linearberegnungsmaschinen - Teil 3: Terminologie und Klassifizierung

Techniques d'irrigation - Installations avec pivots et rampes frontales - Partie 3: Terminologie et classification

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Irrigation techniques - Centre pivot and moving lateral systems - Part 3: Terminology and classification

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This European Standard was approved by CEN on 8 July 1999.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 334 "Irrigation techniques", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2000, and conflicting national standards shall be withdrawn at the latest by February 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Within its programme of work, Technical Committee CEN/TC 334 "Irrigation techniques" charged working group CEN/TC 334/WG 2 "Centre pivot and moving laterals" to prepare the following standard :

- EN 12325-3, *Irrigation techniques - Centre pivot and moving laterals systems - Part 3 : Terminology and classification*

The other standards concerning the irrigation techniques are :

- EN 12325-1, *Irrigation techniques - Centre pivot and moving laterals systems - Part 1 : Presentation of the technical characteristics*
- EN 12325-2, *Irrigation techniques - Centre pivot and moving laterals systems - Part 2 : Minimum performances and technical characteristics*
- prEN ISO 11545, *Agricultural irrigation equipment – Centre-pivot and moving lateral irrigation machines with sprayers or sprinkler nozzles – Determination of uniformity of water distribution (ISO/DIS 11545:1999)*

1 Scope

This European Standard defines and specifies the different outstanding terms and classifications in the field of centre pivots and moving laterals systems, necessary for the understanding of EN 12325-1 and EN 12325-2.

This standard is applicable to fixed and movable pivots, as well as to the different categories of moving laterals.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 12325-1, *Irrigation techniques - Centre pivot and moving laterals systems - Part 1 : Presentation of the technical characteristics.*

EN 12325-2, *Irrigation techniques - Centre pivot and moving laterals systems - Part 2 : Minimum performances and technical characteristics.*

prEN ISO 11545:1999, *Agricultural irrigation equipment – Centre-pivot and moving lateral irrigation machines with sprayer or sprinkler nozzles – Determination of uniformity of water distribution (ISO/DIS 11545:1999).*

ISO 31-0:1992, *Quantities and units – Part 0 : General principles.*

3 Quantities and units

The units used in the different parts of the EN 12325 are :

Table 1 – Quantities and units

Quantities	International units used according to ISO 31-0:1992
Length	meter (m), millimetre (mm)
Mass	kilogram (kg), ton (t)
Time	second (s), minute (min), hour (h)
Electrical current	ampere (A)
Flat angle	radian (rad), degree (°)
Frequency	hertz (Hz), kilo-hertz (kHz)
Force	Newton (N)
Torque	Newton meter (Nm)
Pressure	Pascal (Pa), kilo-Pascal (kPa), mega-Pascal (Mpa)
Power	watt (W), kilo-watt (kW)
Voltage	volt (V)
Volume	litre (l), cubic meter (m^3)
Flow	litre per second (l/s), cubic meter per second (m^3/s), cubic meter per hour (m^3/h)
Area	square meter (m^2), hectare (ha)
Speed	meter per second (m/s), meter per hour (m/h)

4 Terms relating to classification

4.1 Sprinkling lateral

General concepts for centre pivots, moving laterals, movable pivots and mixed-pivot laterals designating one of the four systems defined below.

4.2 Centre pivot (fixed)

Irrigation machine constituted of a long length pipe supported by towers equipped with wheels driven by motors, including a fixed or pivot point at which water and energy arrive.

4.3 Moving lateral

Sprinkling lateral built on the same principal as centre pivots, the displacement of which is lateral (translation motion). The control tower receives or pumps the water and receives or produces its own energy.

4.4 Movable pivot (self propelled, towable)

Also built on the principle of a centre pivot, it is a machine characterised by its capability to move without watering, in translation motion or longitudinally from a sprinkling position to the other. Each position is equipped with a water and energy supply device.

4.5 Mixed pivot lateral

Machine able to cumulate the two functions of a centre pivot and a moving lateral, and thus to irrigate either in rotation or in translation motion.

5 Terms relating to structure

5.1 Span

Unit constituted by a tower and the main distribution pipe which is linked to it.

NOTE Two types of structure can be found : bow string type structure and rectilinear girder type structure.

5.2 Distribution pipe

Pipe through which water is flowing. It is characterised by its outside diameter, wall thickness and length.

NOTE It serves as a girder for the machine structure.

5.3 Truss members

Elements of structure supporting the pipe efforts and distributing them in the truss-rods.

NOTE The truss members work in tension and in compression. They are constituted of 3 to 7 elements at any reinforcement point. They form a triangle in a perpendicular plan to the pipe, to insure the global stability (reversing) of the structure.

5.4 Truss-rod

Metallic element working in tension and linking the different truss members points together.

5.5 Tower

Supporting device to which the span pipe is clutched and the next span leant.

NOTE It is shaped as a triangle, perpendicular to the pipe. It is equipped with a motor and wheels or any other system ensuring grip to the soil and movement.

It also supports a tower box containing alignment and safety devices.

5.6 Overhang

Part of pipe situated at the outer end of the machine. It is supported by the last tower and maintained by shrouds.

5.7 Pivot point

Fixed point from which the rotation of the whole machine is performed. It is characterised by a structure fixed on a concrete flagstone leaving the machine free to rotate.

NOTE Here feeding of water and energy are performed.

5.8 Vertical pipe

Vertical part of the water supplying pipe, constituted of an element fixed to the flagstone and a moving element fixed to the sprinkling lateral.

NOTE Water tightness is performed by a (several) sleeve joint(s).

5.9 Span coupling

Device ensuring hydraulic and mechanical coupling between adjacent spans, or between the pivot point and the first span.

5.10 Control tower

In the case of a movable system, it is the tower which initiates the movement of the whole sprinkling lateral.

NOTE It can be situated in the centre of the lateral or at one of the ends, and be equipped with 2 or 4 wheels, some of them could be driving and possibly steering.

5.11 Guiding tower

Always for movable machines, it guides the lateral thanks to an alignment device, (buried cable, ditch cable...) allowing it to be kept in a preestablished direction.

NOTE This function is often performed by the control tower.

6 Terms relating to movements

6.1 Kinetic chain

Constituted of a motor and gear reducers, generally fixed on the lower cross-bar of the tower, performing the moving function, its movement being transmitted to the wheels gear boxes.

6.2 Speed control device

Device controlling the average moving speed of the machine. It controls the functioning time of the last tower of the machine (centre pivot) or of the guiding tower (movable machines) during a cycle time of one minute generally.

6.3 Alignment device

Device located in the tower box. Each one is constituted of two parts, each one being linked to one of the neighbouring spans.

NOTE Micro-switches or any other devices perform the stopping and starting of the tower's gear motor, and safety functions in case of misalignment.

7 Terms relating to electrical equipment

7.1 Main control panel

Electrical panel including all the controls of the machine, situated at the pivot point or on the control tower.

NOTE It is separated into two circuits : the control circuit using low voltage, and the supplying circuit using voltages lower than 500 V.

7.2 Collector ring

Device distributing electrical power to centre pivots functioning in complete circle, allowing electric power to be supplied whatever its movement is.

7.3 Servo-controls and safety devices

All the safety controls and servo-controls (piloting of a dosing pump, stopping of pumping station in case of problem, etc.) of the machine are centralized in the main control panel.

8 Terms relating to hydraulic equipment

8.1 Head losses

Sum of in pipe energy losses who appears as a decrease in the pressure available when the distance from the supply point increases.

8.2 Sprinklers

Sprinklers are watering devices, fixed or rotating.

NOTE 1 Each sprinkler is characterised by a maximum and minimum working pressures, an emission angle, its proper nozzles series (diameter, type), giving its own range of wetted radius and flow.

NOTE 2 A sprinkler can also be characterised by its connection device type to the main pipe, the possibility of using a regulating device (pressure, flow), the possibility of coupling them to some accessories (upping tubes, hose pipes, etc.).

8.3 End sprinkler

Large sprinkler or a gun type sprinkler with a great wetted radius.

NOTE When the residual pressure is insufficient at the end of the main pipe, a booster pump to give the necessary additional energy can be used.