

ISO 20419:2018 (E)

Treated wastewater reuse for irrigation — Guidelines for the adaptation of irrigation systems and practices to treated wastewater

Contents

	Foreword
	Introduction
1	Scope
2	Normative references
3	Terms and definitions
3.1	Treated wastewater (TWW)
3.2	Filtration
4	TWW quality monitoring for micro-irrigation
4.1	General
4.2	TWW quality monitoring devices
4.2.1	Flushing counter for automated filters
4.2.2	pH level sensor
4.2.3	Clogging capacity meter
4.2.4	Chlorine demand sensor
4.3	TWW quality monitoring procedure
5	TWW reservoirs
5.1	General
5.2	TWW reservoir safety
5.3	TWW reservoir design
5.4	Type of TWW stored in the reservoir
5.5	Quality of TWW stored in the reservoir
5.6	Reservoir processes affecting TWW quality and derived reservoir operation
5.7	Reservoir engineering data and design
5.8	Biological treatment in reservoirs
6	Filtration systems
6.1	General
6.2	Filtration battery manifold structure
6.3	Filtration technology — Filtration media
6.4	Flow/filter area ratio
6.5	Filtration stations location in accordance with flow direction
6.6	Filtration grade
6.7	Manual filter cleaning
7	Pumping stations
7.1	General
7.1.1	Bottom pumping chamber
7.1.2	Floating suction head
7.2	Reservoir stratification prevention
8	Adaptation of emitters to TWW
8.1	General
8.2	Emitters classification
8.3	Drippers
8.3.1	General
8.3.2	On-surface dripper and sub-surface dripper
8.4	Durability and longevity of dripper

8.5	Functional features of the dripper
8.5.1	General
8.5.2	Functional features
8.5.2.1	Water inlet of the dripper
8.5.2.2	Labyrinth flow path
8.5.2.3	Water outlet of the dripper
8.5.2.4	Dripper's sensitivity to changes in discharge
8.6	Sprinkler/centre pivot/frontal pivot
8.6.1	General
8.6.2	Overhead sprinkler
8.6.3	Mini sprinklers
8.6.4	Micro sprinklers and sprayers
8.6.4.1	Discharge range
8.6.4.2	Water distribution
8.6.4.3	Drop suspension
8.6.5	Center pivot sprinklers/sprayers
9	Design parameters for TWW irrigation
9.1	General
9.2	Design parameters for TWW irrigation systems (drippers, sprinkler irrigation machines)
10	Physical treatment
10.1	General
10.2	Flushing mains, sub-mains and tubes
10.3	Collector pipes
11	Chemical treatment
Annex A	(informative) Definition of TWW quality and treatment recommendations for micro-sprinkler irrigation or drip irrigation
Annex B	(informative) TWW quality parameters and test methods
Annex C	(informative) pH effect on Chlorine concentration
Annex D	(informative) Clogging capacity meter
D.1	General
D.2	Gauge structure
D.3	Operating instructions
D.4	Troubleshooting
Annex E	(informative) Sprinklers spacing according to wind conditions
Annex F	(informative) Water stratification in reservoirs
F.1	Epilimnion
F.2	Metalimnion (Thermocline)
F.3	Hypolimnion
F.4	Significance of stratification
F.5	Layers mixing
Annex G	(informative) Reservoir inspection and maintenance specification
G.1	Inspection times
G.2	Inspection specification
G.2.1	Spring inspection
G.2.2	Fall inspection
Annex H	(informative) Chemical treatments in a reservoir
Annex I	(informative) Application of filtration systems to protect drip irrigation systems and spraying systems using TWW: the Israeli experience
I.1	General
I.2	Filters and filtration degrees
I.3	Screen filter
I.4	Disc filter
I.5	Gravel filter (depth filtration)