INTERNATIONAL STANDARD

ISO 13441-2

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Air-assisted agricultural sprayers — Data sheets —

Part 2:
Technical specifications related to components

Pulvérisateurs agricoles à jet porté — Fiches techniques —

Partie 2: Spécifications techniques relatives aux composants

Reference number
ISO 13441-2:1997(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 13441-2 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 6, *Equipment for crop protection.*

ISO 13441 consists of the following parts, under the general title *Air-assisted agricultural sprayers — Data sheets* :

— *Part 1 : Typical layout*

— *Part 2 : Technical specifications related to components*

Annex A forms an integral part of this part of ISO 13441.

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Air-assisted agricultural sprayers — Data sheets —

Part 2:
Technical specifications related to components

1 Scope

This part of ISO 13441 establishes the technical specifications of data sheet presentation, for the preparation of documents giving information about dimensions, materials, characteristics and design of air-assisted agricultural sprayers used for the application of crop protection products in arboriculture, viticulture and hop cultivation. Use of data sheets prepared according to this part of ISO 13441 will facilitate discussion between the manufacturers of sprayers and the manufacturers of component parts and accessories.

This part of ISO 13441 does not cover mass and dimensions of the sprayer, nor information relating to the basic machine required by the manufacturer. Such information is given in ISO 13441-1.

This part of ISO 13441 is applicable during the preparation of data sheets by manufacturers or importers of air-assisted agricultural sprayers, whether mounted, trailed or self-propelled.

The list of codes to be used for the codified descriptors is given in annex A.

2 General specifications

2.1 Manufacturer

Name and address of manufacturer/distributor/importer: .....

.....

.....

.....

.....

2.2 Type and year of manufacture

Type:

Mounted	Trailed (p.t.o. driven)
Self-propelled	Trailed (driven by engine)

General design of spraying and auxiliary devices (code 502): .....

Capacity: l

Year of manufacture: .....

Model: .....

Direct indication of the year of manufacture (explanation of code): .....

.....

Location of marking (code 101): .....

.....

2.3 Trade-name(s)

.....

3 Tank specifications

	Principal tank	Rinsing tank	Clean water tank
3.1 Material (code 102)			
3.2 Volume			
Nominal volume:	l	l	l
Real volume:	l	l	l

3.3 Dimensions

	Principal tank	Rinsing tank	Clean water tank
Length:	mm	mm	mm
Width:	mm	mm	mm
Height (to the upper edge of filling hole):	mm	mm	mm

3.4 Level indicator

Type (code 303):			
Indicating range:	from ..... l to l	from ..... l to l	from ..... l to l
Graduation:	l	l	l
Location (code 304):			

3.5 Filling hole

Location (code 306):			
Diameter:	mm	mm	mm
Filling sieve			
material (code 102):			
diameter:	mm	mm	mm
depth:	mm	mm	mm
filtration surface:	mm^2	mm^2	mm^2
mesh width:	mm	mm	mm
Cap design (code 305):			

3.6 Agitator

Type (code 307):			
Design (code 308):			
Location (code 310):			

3.7 Drainage device

	Principal tank	Rinsing tank	Clean water tank
Type (code 312):			
Design (code 313):			
Location (code 314):			

3.8 Filling device for principal tank

Type (code 315):		
Design (code 316):		
Location (code 317):		
Volumetric flow rate with water:	l/min	
Shut-off valve:	YES	NO
location:		
Crop protection product induction unit:	YES	NO
design (code 318):		
location (code 319):		

3.9 Dosing devices for crop protection products

Type (code 320):	
Design (code 321):	
Location (code 319):	
Measuring range:	
Measuring accuracy:	

4 Pump specifications

4.1 Main pump

Manufacturer:	
Design (code 402):	
Trade-name:	
Model:	
Location (code 403):	
Drive (code 404):	
Connection:	
Nominal pressure:	MPa
Nominal speed:	r/min
Volumetric flow rate	
non-pressurised:	l/min
at nominal pressure:	l/min
Pressure pulsation damper:	YES NO
design (code 407):	
material (code 102):	

4.2 Other pumps

Function (code 405):	
Manufacturer:	
Design (code 402):	
Designation:	
Location (code 403):	
Drive (code 404):	
Connection:	

Nominal pressure: ..... MPa

Nominal speed: ..... r/min

Volumetric flow rate

non-pressurised: ..... l/min

at nominal pressure: ..... l/min

Pressure pulsation damper: ..... YES NO

design (code 407): .....

material (code 102): .....

5 Specifications for spraying and auxiliary devices

Operating principle (code 501): .....

General design (code 502): .....

5.1 Spraying device

Number of independent sectors: .....

Total number of nozzles: .....

Nozzle tips

trade-name: .....

model: .....

design (code 711): .....

manufacturer: .....

number: .....

location (code 714): .....

optimum spraying pressure: ..... MPa

spraying pressure range: ..... from ..... MPa to ..... MPa

speed of recommended rotation (centrifugal nozzles): ..... r/min

Nozzle body

designation:	
design (code 715):	
movement (code 716):	
regulation of spraying angle:	
material (code 102):	
swivel nut thread:	

Anti-drip device

designation:	
design (code 720):	
material (code 102):	
opening pressure:	MPa
closing pressure:	MPa

Individual shut-off device

design (code 721):	
function:	
control (code 103):	

Inter-nozzle supply line

design:	
material (code 102):	
inside diameter:	mm
outside diameter:	mm
maximum operating pressure (indicated by marking):	MPa

5.2 Air assistance device

5.2.1 Main fan(s)

Design (code 503):		
Inside diameter at rotor position:	mm	
Blade material (code 102):		
Adjustment of blade attack angle:	YES	NO
Number of positions:		
Inside deflectors before rotor:	YES	NO
Inside deflectors after rotor:	YES	NO
Fan drive mechanism (code 504):		
Centrifugal clutch:	YES	NO
Gear box in transmission:	YES	NO
Multiplication ratios:		
Neutral point:	YES	NO
Total air throughput (maximum):	m^3/h	
Adjustment of flow rate in proportion to feed speed:	YES	NO

5.2.2 Air flow direction deflectors

Design (code 505):	
Material:	
Movement (code 506):	
Folding away for transport (code 508):	

5.2.3 Additional fan(s)

Number:	

Design (code 507): .....

Blade material (code 102): .....

Drive mechanism: .....

Total air throughput (maximum): ..... m^3/h

Adjustment of operating height: ..... YES NO

Folding away for transport (code 508): .....

5.2.4 Air lines for each nozzle

Total number of lines: .....

Direction adjustment: ..... YES NO

5.2.5 Recuperation or reflection panels

Design (code 509): .....

6 Specifications for liquid line(s)

6.1 Suction lines

Number: .....

Material (code 102): .....

Design (code 801): .....

Inside diameter: ..... mm

Length(s): ..... m

Maximum operating pressure (indicated by marking): ..... MPa

6.2 Pressure lines

6.2.1 From pump to central

Number: .....

Material (code 102): .....

Design (code 801): .....

Inside diameter:	mm
Length(s):	m
Marked pressure:	MPa

6.2.2 Pressurised line(s) to spraying devices

Number:	
Material (code 102):	
Design (code 801):	
Inside diameter(s):	mm
Length(s):	m
Marked pressure:	MPa

6.2.3 Agitator line(s)

Number:	
Material (code 102):	
Design (code 801):	
Inside diameter(s):	mm
Length(s):	m
Marked pressure:	MPa

6.3 Return flow lines

Number:	
Material (code 102):	
Design (code 801):	
Inside diameter(s):	mm
Length(s):	m
Marked pressure:	MPa

6.4 Other lines

Number: .....

Location: .....

Material (code 102): .....

Design (code 801): .....

Inside diameter(s): ..... mm

Length(s): ..... m

7 Filter specifications

7.1 Filling filter

Material (code 102): .....

Inside diameter: ..... mm

Length: ..... mm

Filtering surface: ..... mm^2

Mesh width: ..... mm

7.2 Filter on the suction line

Number: .....

Design (code 803): .....

Location (code 804): .....

Filter element

material (code 102): .....

inside diameter: ..... mm

length: ..... mm

filtering surface: ..... mm^2

mesh width: ..... mm

7.3 Filter on the pressurized side

7.3.1 In lines

Number: .....

Function (code 802): .....

Design (code 803): .....

Location (code 804): .....

Filter element

material (code 102): .....

diameter: ..... mm

length: ..... mm

filtering surface: ..... mm^2

mesh width: ..... mm

7.3.2 In fittings

Number: .....

Function (code 802): .....

Design (code 803): .....

Location (code 804): .....

Filter element

material (code 102): .....

diameter: ..... mm

length: ..... mm

filtering surface: ..... mm^2

mesh width: ..... mm

7.3.3 In nozzle support

Number: .....

Design (code 803): .....

Location (code 804): .....

Filter element

material (code 102): .....

diameter: ..... mm

length: ..... mm

filtering surface: ..... mm^2

mesh width: ..... mm

7.4 Additional filters

Number: .....

Function (code 802): .....

Design (code 803): .....

Location (code 804): .....

Filter element

material (code 102): .....

diameter: ..... mm

length: ..... mm

filtering surface: ..... mm^2

mesh width: ..... mm

8 Specifications for control and measuring devices

8.1 Pressure regulator

Design (code 902): .....

Function (code 901): .....

Location (code 900): .....

Pressure regulating range:	from ..... MPa to ..... MPa
Control (code 103):	

8.2 Central switch

Design:		
Location:		
Control (code 103):		
Suck-back device:	YES	NO

8.3 Pressurized draining device

Design (code 904):	

8.4 Shut-off valves

Number:	
Design (code 903):	
Location:	
Control (code 103):	

8.5 Manometer(s)

Number:	
Location:	
Scale range:	from ..... MPa to ..... MPa
Graduation:	
Diameter:	mm
Scale:	
Casing:	mm
Damping:	

Compensation (code 907): .....

Accuracy class: .....

9 Regulation systems specifications

9.1 System with constant flow rate

Speedometer (code 912): .....

Flow meter (code 913): .....

Regulation valve (code 914): .....

Computer (code 915): .....

Function (code 910): .....

Location (code 911): .....

Control (code 103): .....

Working range

pressure: ..... from ..... MPa to ..... MPa

volumetric flow rate: ..... from ..... l/min to .... l/min

p.t.o. speed: ..... from ..... r/min to .... r/min

speed of travel: ..... from ..... m/s to ..... m/s

maximum deviation from calibrated quantity: ..... from + ... % to – ..... %

9.2 System with variable flow rate

Speedometer (code 912): .....

Flow meter (code 913): .....

Regulation valve (code 914): .....

Computer (code 915): .....

Function (code 910): .....

Location (code 911): .....

Control (code 103): .....

Working range

pressure:	from ..... MPa to ..... MPa
volumetric flow rate:	from ..... l/min to ..... l/min
p.t.o. speed:	from ..... r/min to ..... r/min
speed of travel:	from ..... m/s to ..... m/s
maximum deviation from calibrated quantity:	from + ...% to – ..... %

9.3 Other regulation systems

Speedometer (code 912):	
Flow meter (code 913):	
Regulation valve (code 914):	
Computer (code 915):	
Function (code 910):	
Location (code 911):	
Control (code 103):	

Working range

pressure:	from ..... MPa to ..... MPa
volumetric flow rate:	from ..... l/min to .....l/min
p.t.o. speed:	from ..... r/min to ..... r/min
speed of travel:	from ..... m/s to ..... m/s
maximum deviation from calibrated quantity:	from + ... % to – ..... %

10 Specifications for volumes of residuals

10.1 Volume of residual in the tank

On flat surface: ..... | |

On side-slope

	On side-slope of 8,5°		Maximum angle given by the manufacturer: °	
	in litres	as percentage of nominal tank volume	in litres	as percentage of nominal tank volume
in the contour, direction of travel				
to the left.....	l	%	l	%
to the right	l	%	l	%
in the contour gradient				
ascending	l	%	l	%
descending	l	%	l	%

10.2 Dead volume

On flat surface: ..... | |

On side-slope

	On side-slope of 8,5°		Maximum angle given by the manufacturer: °	
	in litres	as percentage of nominal tank volume	in litres	as percentage of nominal tank volume
in the contour, direction of travel				
to the left.....	l	%	l	%
to the right	l	%	l	%
in the contour gradient				
ascending	l	%	l	%
descending	l	%	l	%

11 Specifications for other special accessories

11.1 Test adapter(s)

Type (code 1001):.....

Location (code 1002):.....

11.2 Electrostatic charge device

Trade-name: .....

Model: .....

Annex A
(normative)

Code list

If the code number "99" is used, a description which is as exact as possible should be given.

When more than one code is used, the code numbers shall be separated by "+".

101 General — Location of marking

	Implement part		Location
0		no marking	
1	on chassis	1	front left
2	on tank	2	front middle
3	on auxiliary parts	3	front right
99	other	4	rear left
		5	rear middle
		6	rear right
		7	left
		8	right
		99	elsewhere

102 Material

1	aluminium
2	special steel
3	special steel covered by synthetic material
4	fibreglass
5	rubber
6	rubber with textile insert
7	hard rubber
8	stainless steel
9	glass-fibre reinforced synthetic material
10	brass
11	buna N rubber
12	polyamide (Nylon, Perlon)
13	polyester
14	polyethylene

15 polyethylene with textile insert
16 polyethylene with spiral (for hoses)
17 polyoxymethylene
18 polyvinylchloride
19 polyvinylchloride with textile insert
20 polyvinylchloride with spiral line (for hoses)
21 cellular material
22 steel
23 steel covered by polyester
24 rustless steel
25 galvanized steel
26 Viton
99 other

103 Control

0 no control
1 mechanically driven by hand
2 mechanically driven by p.t.o.
3 hydraulically driven
4 pneumatically driven
5 electrically driven
6 electromotively driven
7 electropneumatically driven
8 electrohydraulically driven
9 electromagnetically driven
99 other

303 Tank — Level indicator — Type

0	no level indicator
1	simple scale, transparent background
2	simple scale, non-transparent background
3	scale on viewing glass
4	stand pipe with scale
5	stand pipe with scale and float
6	scale with float
7	round scale with pointer and float in tank
8	straight scale with increasing graduation downwards and float in tank
9	electronic indication
99	other

304 Tank — Level indicator — Location

0	no level indicator		
1	on external face	1	at front
2	in the tractor cab	2	on right
99	elsewhere	3	at rear
		4	inside, at left
		5	in middle
		6	on left
		7	inside, on right
		8	open choice

305 Tank — Filling hole — Design of lid

	Lock system		Aeration		Seal
0	no lock	0	no aeration	0	no seal
1	lid border with claws	1	with aeration	1	packing ring
2	hinged lid			2	O-ring seal
3	screw cap			3	sealing round cord
4	lid to be inserted			4	sealing lip
5	lid with a bow-shaped lock			5	labyrinth seal
6	turn-lock fastener			99	other
99	other				

306 Tank — Filling hole — Location

0	no filling hole
1	central
2	on left
3	on right
4	in front
5	at rear
99	elsewhere

307 Tank — Agitator — Type

0	no agitator
1	return flow
2	pressure agitator
3	with one nozzle tube
4	with two nozzle tubes
5	with one injector
6	with two injectors
7	turbine
8	propeller
9	wobble disc
99	other

308 Tank — Agitator — Design

0	no handling
1	no switch-off
2	switch-off possible
3	adjustable
99	other

310 Tank — Agitator — Location

0	no agitator
1	centrally above tank bottom
2	laterally on left above tank bottom
3	laterally on right above tank bottom
4	laterally on both sides above tank bottom
5	laterally on both sides and centrally above tank bottom
99	elsewhere

312 Tank — Drainage device — Type

1	separate outlet valve
2	in combination with suction device
99	other

313 Tank — Drainage device — Design

1	ball valve
2	valve
3	male fitting
4	disconnecting of suction hose
5	removal of filter mesh
99	other

314 Tank — Drainage device — Location

1	on left
2	on right
3	in front
4	at rear
5	at suction filter
6	at pump
7	at tank sump
99	elsewhere

315 Tank — Filling device — Type

0 no filling device
1 with connection to water hose
2 with main pump of sprayer
3 with filling pump
99 other

316 Tank — Filling device — Design

0 no filling device
1 suction hose with filter mesh
2 suction hose with filter mesh and non-return valve
3 hose connection with integral device producing a free jet (prevention of backflow)
99 other

317 Tank — Filling device — Location

0 no filling device
1 at filter valve
2 at suction valve
3 at pump
4 at filling hole
5 adjacent to filling hole
99 elsewhere

318 Tank — Filtration device — Design

0 no filtration device
1 filling sieve
2 filling shower
3 injector
4 injector with device for tank cleaning
99 other

319 Tank — Filtration device, dosing device — Location

0 no filtration device
1 on right of tank
2 on left of tank
3 filling hole
4 on right of chassis
5 on left of chassis
99 elsewhere

320 Tank — Dosing device — Type

0 no dosing apparatus
1 intermittent
2 continuous (direct to tank)
99 other

321 Tank — Dosing device — Design

0 no dosing apparatus
1 injector with product measuring
2 pump with product measuring
3 injector with electric volumeter
4 pump with electric volumeter
5 pump with no product measuring (dosing pump)
6 dosing pump with volume indicator
7 hydraulically by main stream
99 other

402 Pump — Design

	Type
0	no pump
1	reciprocating pump/in-line
2	reciprocating pump/star-shaped
3	reciprocating pump/opposed type
4	piston pump/in-line
5	piston pump/star-shaped
6	piston pump/opposed type
7	diaphragm pump/opposed type
8	diaphragm pump/star-shaped
9	diaphragm pump/opposed type
10	centrifugal pump
11	roller pump
12	vane-cell pump
13	peristaltic pump
99	other

	Number of pistons/chambers
0	no piston/chambers
n	n = number of pistons/chambers

403 Pump — Location

0	no pump
1	at front of tractor (pump directly driven by p.t.o.)
2	at rear of tractor (pump directly driven by p.t.o.)
3	in front of tank, mounted on rigid holding device
4	in front of tank, mounted on adjustable holding device
5	under tank, mounted on rigid holding device
6	under tank, mounted on adjustable holding device
7	behind tank, mounted on rigid holding device
8	behind tank, mounted on adjustable holding device
99	elsewhere

404 Pump — Drive

0 no pump
1 p.t.o. (pump directly driven by p.t.o.)
2 p.t.o. and chain drive
3 p.t.o. in conjunction with p.t.o. drive shaft
4 p.t.o. in conjunction with p.t.o. drive shaft and chain drive
5 p.t.o. in conjunction with p.t.o. drive shaft and V-belt
6 hydraulic motor
99 other

405 Pump — Function

0 no pump
1 additional main pump
2 agitator driving mechanism
3 driving mechanism of filling device
4 driving mechanism of filling device and agitator
5 filtration of agrochemical products
99 other

407 Pump — Pressure pulsation damper — Design

0 no pressure pulsation damping
1 air dome
2 air dome and diaphragm on suction side
3 integrated accumulator with diaphragm
4 integrated accumulator with diaphragm on suction side
5 separate accumulator with diaphragm
6 separate accumulator with diaphragm on suction side
99 other

501 Spraying and auxiliary devices — Operating principle

0 no air assistance (non-air-assisted)
1 air assistance (air-assisted)

502 General design

0 spray booms
1 main fan(s)
2 main fan and upper deflectors
3 main fan and additional fan(s)
4 main fan and ventilation lines for each nozzle
5 recuperation or reflection panels on one side
6 recuperation or reflection panels on two sides
7 recuperation or reflection panels in the centre (as on a straddling vineyard tractor)
99 other

503 Main fan(s) — Design

0 no main fan(s)
1 axial rear suction fan
2 axial intermediary suction fan
3 axial front suction fan
4 axial rear suction fan with additional outlets carrying the lower expelled air
5 radial rear suction fan
6 two radial rear suction fans
7 two or more cross-flow fans
99 other

504 Drive of additional main fan(s)

0 no main fan(s)
1 p.t.o.
2 p.t.o. and chain drive
3 p.t.o. and drive shaft
4 p.t.o. in conjunction with p.t.o. drive shaft and chain drive
5 p.t.o. in conjunction with p.t.o. drive shaft and V-belt
6 hydraulic motor
99 other

505 Airflow direction deflectors — Design

0 no deflectors
1 Y deflectors
2 T deflectors
3 I deflectors
4 adjustable deflectors (adjustable flaps)
5 adjustable and removable deflectors
99 other

506 Deflectors — Movement

0 no movement
1 oscillating, driven by hydraulic motor
2 oscillating, driven by electric motor
3 oscillating, driven by V-belt
4 oscillating, chain driven
99 other

507 Additional fan(s) — Design

0 no additional fan(s)
1 axial fan
2 two or more axial fans
3 radial fan
4 two or more radial fans
5 two or more cross-flow fans
99 other

508 Deflectors and additional fan(s) — Folding away for transport

0 non-variable, no movement
1 manual
2 hydraulic device
99 other

509 Recuperation or reflection panels

0 no panels
1 group of panels on one side
2 two groups of panels on the two sides
3 panels in the central position (as on a straddling vineyard tractor)
99 other

711 Spraying devices — Nozzle tips — Design

1 fan nozzle
2 twin fan nozzle
3 full cone nozzle
4 hollow cone nozzle
5 solid jet nozzle
6 deflector nozzle
7 pneumatic nozzle
8 centrifugal nozzle
99 other

714 Spraying device — Nozzle tips — Location

1 before airflow
2 inside airflow
3 after airflow
4 combination of above
5 inside individual air lines
6 elsewhere

715 Spraying device — Nozzle body — Design

1 single non-variable nozzle
2 single adjustable nozzle
3 two interchangeable nozzles
4 set of two nozzles
5 set of three nozzles
6 set of four nozzles
99 other