
**Diagrams for the chemical and
petrochemical industry —**

**Part 2:
Graphical symbols**

*Schémas de procédé pour l'industrie chimique et pétrochimique —
Partie 2: Symboles graphiques*





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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 10628-2 was prepared by Technical Committee ISO/TC 10, *Technical product documentation*, Subcommittee SC 10, *Process plant documentation*.

This first edition of ISO 10628-2, along with ISO 10628-1 (under preparation), cancels and replaces ISO 10628:1997, which has been technically revised.

ISO 10628 consists of the following parts, under the general title *Diagrams for the chemical and petrochemical industry*:

— *Part 2: Graphical symbols*

The following part is under preparation:

— *Part 1: Specification of diagrams*

Diagrams for the chemical and petrochemical industry —

Part 2: Graphical symbols

1 Scope

This part of ISO 10628 defines graphical symbols for the preparation of diagrams for the chemical and petrochemical industry. It is a collective application standard of the ISO 14617 series.

This part of ISO 10628 does not apply to graphical symbols for electrotechnical diagrams; for these, see IEC 60617.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 10209, *Technical product documentation — Vocabulary — Terms relating to technical drawings, product definition and related documentation*

ISO 14617 (all parts), *Graphical symbols for diagrams*

ISO 15519-1, *Specification for diagrams for process industry — Part 1: General rules*

ISO 81714 (all parts), *Design of graphical symbols for use in the technical documentation of products*

IEC 81714 (all parts), *Design of graphical symbols for use in the technical documentation of products*

3 Terms and definitions

For the purposes of this document, the definitions given in the ISO 14617 series and ISO 10209 apply.

4 Structure of graphical symbols

The graphical symbols are grouped according to functional and/or design features. See Table 1.

Table 1 — Subject groups

Group number	Subject group
1	Vessels and tanks
2	Columns with internals
3	Heat exchangers
4	Steam generators, furnaces, recooling device
5	Cooling tower
6	Filters, liquid filters, gas filters
7	Screening devices, sieves and rakes
8	Separators
9	Centrifuges
10	Drier

Table 1 (continued)

Group number	Subject group
11	Crushing/Grinding machines
12	Mixers/Kneaders
13	Shaping machines – processing in vertical direction
14	Shaping machines – processing in horizontal direction
15	Liquid pumps
16	Compressors, vacuum pumps
17	Blowers, fans
18	Lifting, conveying and transport equipment
19	Proportioners, feeders and distribution facilities
20	Engines
21	Valves
22	Check valves
23	Valves and fittings with safety function
24	Fittings
25	Graphical symbols for piping
26	Apparatus elements
27	Internals
28	Agitators, stirrers
29	Internal characteristics and built-in-components

5 Graphical symbols

Graphical symbols for diagrams used in chemical and petrochemical industry are presented in Table 2, which is divided into four columns, as follows:

1	Item no.	Consecutive numbering within each subject group according to Table 1
2	Reg. no.	Registration numbers structured as follows: nnn Registration number for ISO 14617 graphical symbols. Cnnnn Preliminary registration number for a new graphical symbol, which will be implemented in ISO 14617. The preliminary registration number will be replaced with the final ISO 14617 registration number at first periodical review of ISO 10628-2. X2nnn Registration number for ISO 14617 symbol examples. X8nnn Registration number for ISO 10628-2 symbol examples.
3	Graphical symbol	Graphical symbols shown with a 2,5 mm dotted grid behind. Preferred locations of connections at graphical symbols are indicated by “—”. This is not a part of the graphical symbol.
4	Description	The preferred descriptors for the graphical symbol.

Rules for modification of proportions and orientation of graphical symbols are given in ISO 81714 and IEC 81714.

If a graphical symbol is not accessible in ISO 10628-2, then ISO 14617 should be consulted for the needed graphical symbol.

If the needed graphical symbol is not available in ISO 14617, then the symbol shall be created by combining ISO 14617 symbols of basic nature with symbols given supplementary information according to rules given in ISO 14617, ISO 81714 and IEC 81714.

Table 2 — Graphical symbols for diagrams

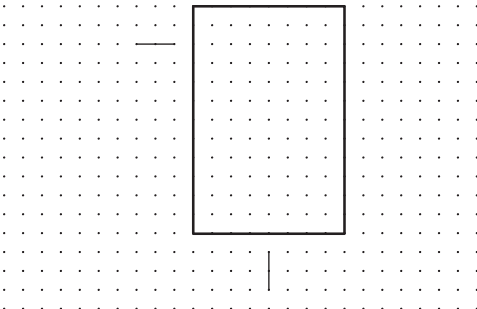
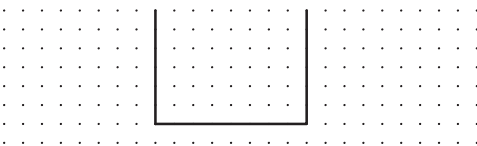
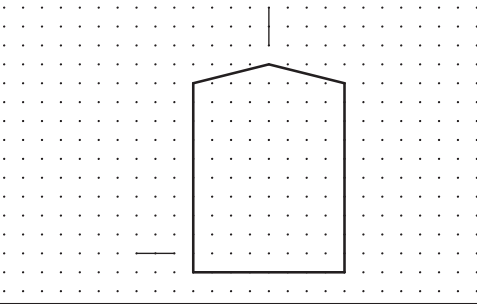
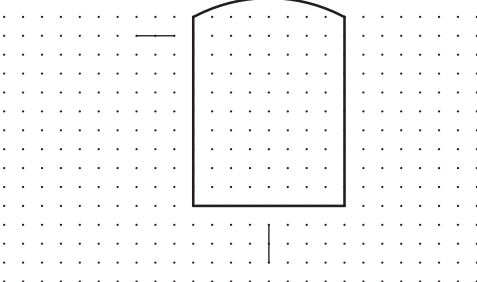
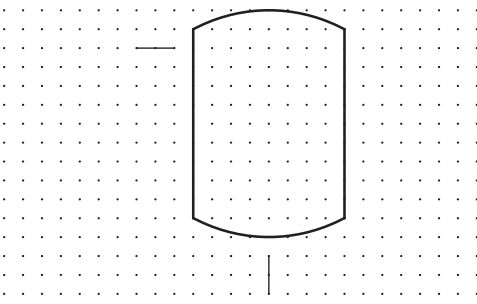
Item no.	Reg. no.	Graphical symbol	Description
1		VESSELS AND TANKS	
1.1	301		Tank, vessel
1.2	2061		Container, tank, cistern
1.3	X2063		Tank with conical roof and flat bottom
1.4	X8200		Tank with dished roof
1.5	2062		Tank, vessel with dished ends

Table 2 (continued)

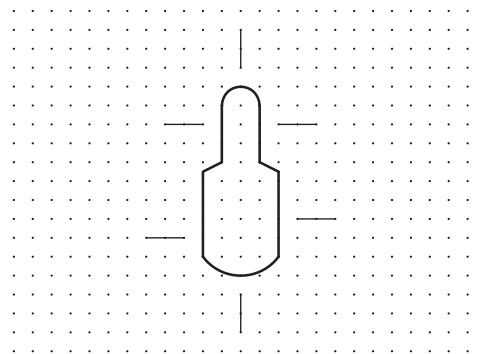
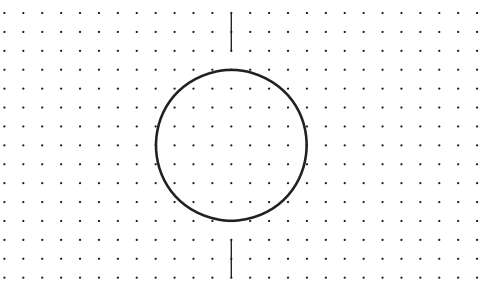
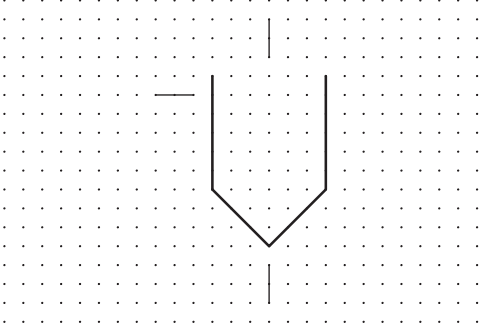
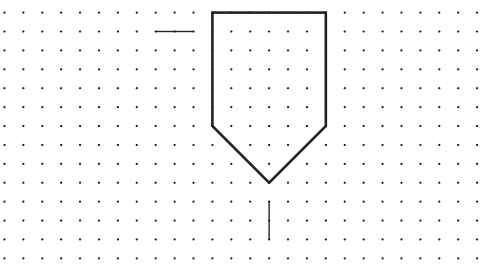
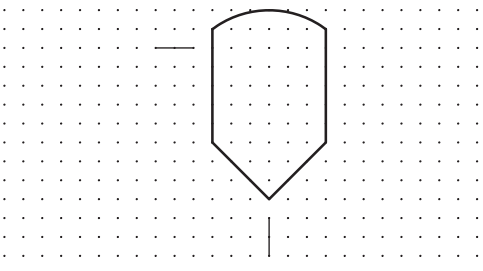
Item no.	Reg. no.	Graphical symbol	Description
1.6	X8201		Vessel with two different diameters
1.7	2063		Spherical vessel
1.8	2064		Bunker with conical bottom
1.9	X2062		Closed tank with conical bottom
1.10	X8008		Vessel with dished roof and conical bottom

Table 2 (continued)

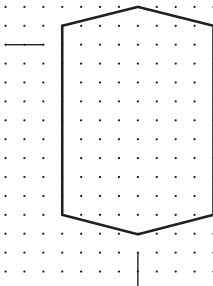
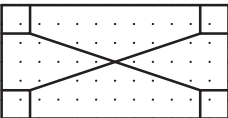
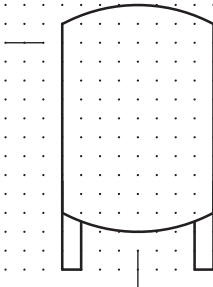
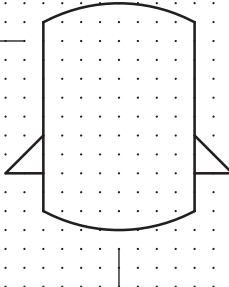
Item no.	Reg. no.	Graphical symbol	Description
1.11	X8009		Vessel with conical roof and bottom
1.12	C0001		Container for solids, liquids, gases
1.13	2067		Barrel, drum
1.14	C0002		Gas cylinder
1.15	2068		Bag
1.16	X8002		Vessel with dished ends and support legs
1.17	X8003		Vessel with dished ends and support brackets

Table 2 (continued)

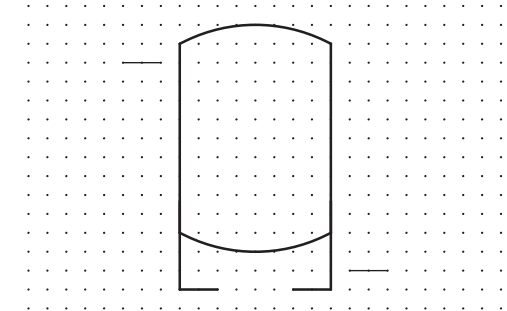
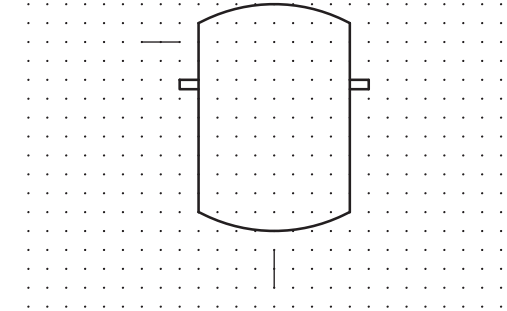
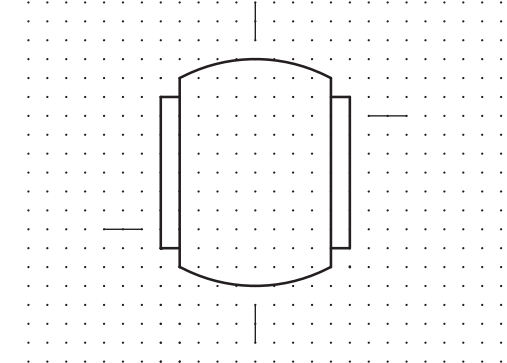
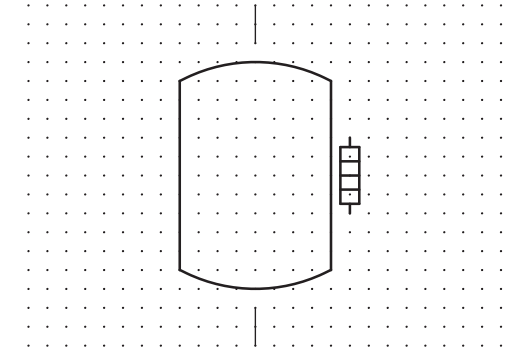
Item no.	Reg. no.	Graphical symbol	Description
1.18	X8004		Vessel with dished ends and support skirt
1.19	X8005		Vessel with dished ends and support ring
1.20	X2069		Vessel with dished ends and heating/cooling jacket
1.21	X2070		Vessel with dished ends and electrical heating

Table 2 (continued)

Item no.	Reg. no.	Graphical symbol	Description
1.22	X8098		Vessel with dished ends and thermal insulation
1.23	X8007		Vessel with dished bottom and surface indication
1.24	X8010		Spherical vessel on legs
1.25	X8000		Vessel with full-tube heating/cooling coil

Table 2 (continued)

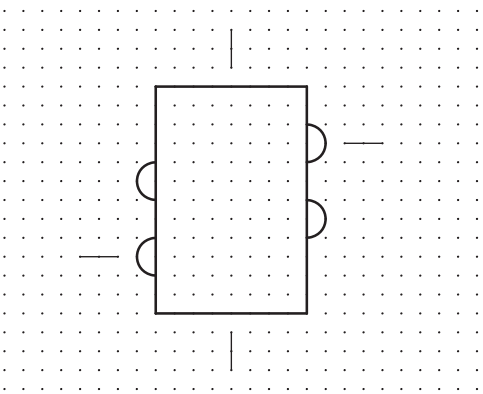
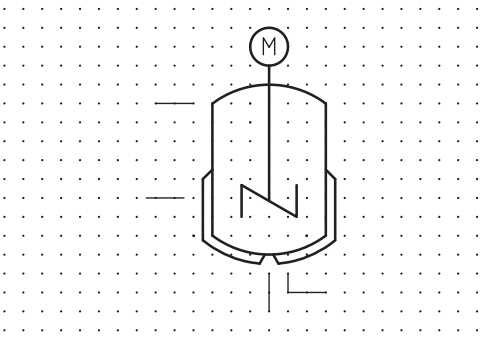
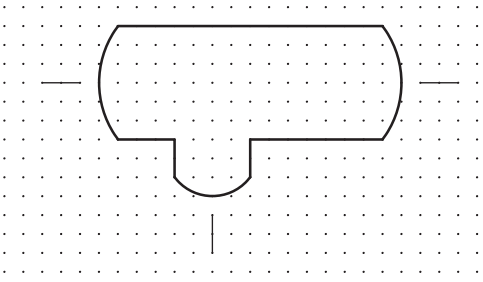
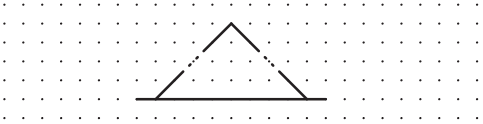
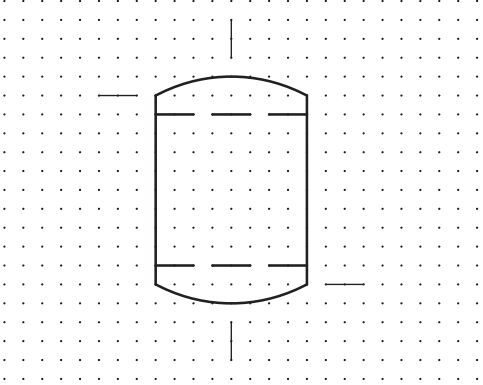
Item no.	Reg. no.	Graphical symbol	Description
1.26	X8001		Vessel with semi-tube heating/cooling coil
1.27	X8006		Jacketed vessel with dished ends and agitator driven by electric motor
1.28	X8202		Vessel with pit
1.29	2065		Open bulk storage
2	COLUMNS WITH INTERNALS		
2.1	X8100		Column (general)

Table 2 (continued)

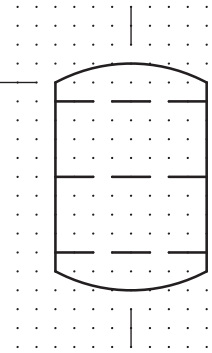
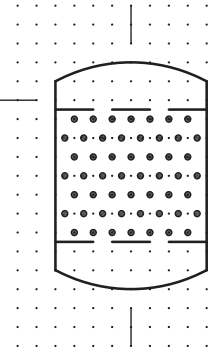
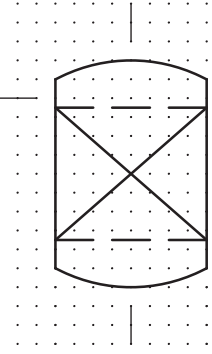
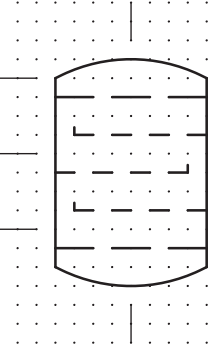
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2.2	X8101		Tray column (general)
2.3	X8014		Column with fluidized bed
2.4	X8015		Column with fixed bed
2.5	X8013		Column with staggered baffle trays

Table 2 (continued)

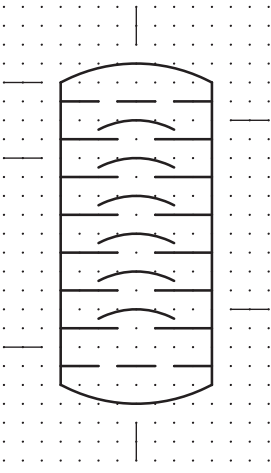
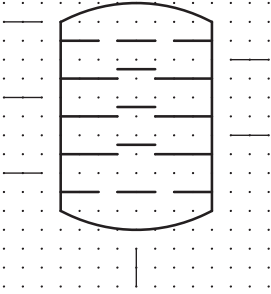
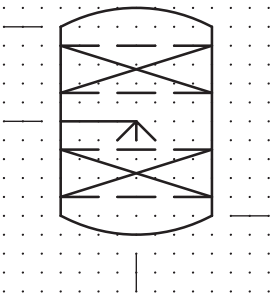
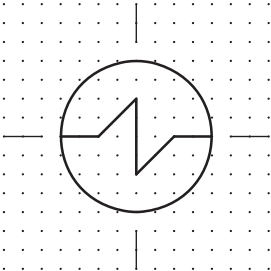
Item no.	Reg. no.	Graphical symbol	Description
2.6	X8011		Column with bubble cap trays
2.7	X8012		Column with valve trays
2.8	X8016		Column with two fixed bed sections and intermediate spray nozzle
3	HEAT EXCHANGERS		
3.1	X8079		Heat exchanger (general), condenser

Table 2 (continued)

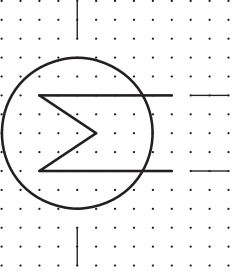
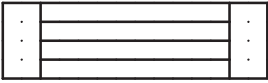
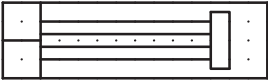
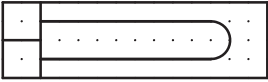
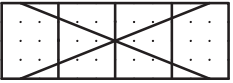
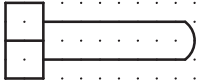
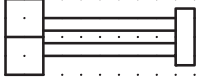
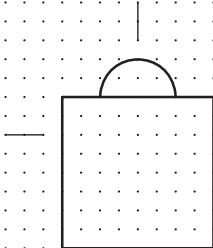
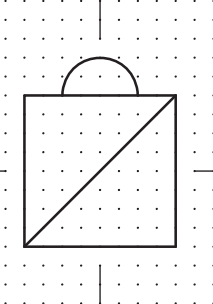
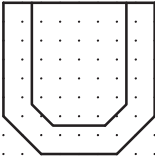
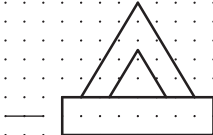
Item no.	Reg. no.	Graphical symbol	Description
3.2	X8017		Heat exchanger (M-shape)
3.3	2511		Heat exchanger with straight tubes (fixed-tube plates)
3.4	2512		Heat exchanger of floating head type
3.5	2513		Heat exchanger with U-shaped tubes
3.6	2516		Heat exchanger of plate type
3.7	2514		Heat exchanger with coil shaped tubes

Table 2 (continued)

Item no.	Reg. no.	Graphical symbol	Description
3.8	2515		Heat exchanger of double-pipe type
3.9	X8018		Heat exchanger with finned tube
3.10	X2505		Heat exchanger with finned tube and fan
3.11	2517		Heat exchanger of spiral type
3.12	X8131		Evaporator, re-boiler
3.13	X8132		Electric heater
3.14	X8133		Thin-film evaporator

Table 2 (continued)

Item no.	Reg. no.	Graphical symbol	Description
3.15	X8136		Tube bundle, heat exchanger with U-shaped tubes
3.16	X8137		Tube bundle, heat exchanger of floating head type
4	STEAM GENERATORS, FURNACES, RECOOLING DEVICE		
4.1	2532		Boiler with dome
4.2	X8103		Steam generator with hot liquid as generating media
4.3	2533		Furnace
4.4	X8107		Firing system, burner (general)