
**Grafične oznake na detajlnih kartah, tlorisih in na geoloških prerezih - 3. del:
Prikaz magmatskih kamnin**

Graphical symbols for use on detailed maps, plans and geological cross-sections -- Part 3: Representation of magmatic rocks

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Symboles graphiques à utiliser sur les cartes, les plans et les coupes géologiques détaillés -- Partie 3: Représentation des roches magmatiques

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01.080.30	Grafični simboli za uporabo v risbah, diagramih, načrtih, zemljevidih v strojništvu in gradbeništvu ter v ustrezni tehnični proizvodni dokumentaciji	Graphical symbols for use on mechanical engineering and construction drawings, diagrams, plans, maps and in relevant technical product documentation
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Graphical symbols for use on detailed maps, plans and geological cross-sections — Part III : Representation of magmatic rocks

*Symboles graphiques à utiliser sur les cartes, les plans et les coupes géologiques détaillés —
Partie III : Représentation des roches magmatiques*

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 82 has reviewed ISO Recommendation R 710/III and found it suitable for transformation. International Standard ISO 710/III therefore replaces ISO Recommendation R 710/III-1970.

ISO Recommendation R 710/III was approved by the Member Bodies of the following countries :

Australia	Greece	Spain
Belgium	India	Sweden
Czechoslovakia	Iran	Turkey
Egypt, Arab Rep. of	Israel	United Kingdom
France	Italy	U.S.S.R.
Germany	Netherlands	

The Member Bodies of the following countries expressed disapproval of the Recommendation on technical grounds :

Chile	New Zealand*
Hungary	South Africa, Rep. of*
Ireland*	

The Member Body of the following country disapproved the transformation of ISO/R 710/III into an International Standard :

Poland

Other documents in this series on graphical symbols for use on detailed maps, plans and geological cross-sections include :

Part I : *General rules of representation.*

Part II : *Representation of sedimentary rocks.*

Part IV : *Representation of metamorphic rocks.* (In preparation.)

Part V : *Representation of minerals.* (In preparation.)

* Subsequently, these Member Bodies approved the Recommendation.

Graphical symbols for use on detailed maps, plans and geological cross-sections – Part III : Representation of magmatic rocks

1 SCOPE AND FIELD OF APPLICATION

This International Standard provides a series of symbols and ornaments for the representation of magmatic rocks on detailed maps, especially large-scale maps, plans and geological cross-sections.

The symbols may be divided in two groups :

- 1) main types;
- 2) varia.

They are reproduced in two tables which, being derived from a logical system, may be completed easily in case of need.

2 MAIN TYPES

2.1 Principles of representation (see table 1)

The table of the main types comprises plutonic and volcanic rocks.

2.1.1 In the first column are given the plutonic rocks subdivided into eight groups, essentially according to their silica content. For each of the groups 1 to 6 two basic symbols are indicated beside column 1, under the letters *a* and *b*, while only one basic symbol is assigned to each of groups 7 and 8. Two basic symbols have been kept for the first six groups to allow, where it seems desirable, on the same sheet, the representation of rocks of similar petrographic composition but of different age, for example.

When a more detailed subdivision of the main types is required, the symbols assigned to various groups are slightly modified (see column 2 for groups 3, 4, 6 and 7). If the differentiation is to be taken still further, suitable additional symbols are to be used.

2.1.2 The dyke rocks which correspond to plutonic rocks are to be represented by the same symbols as the plutonic rocks. Special symbols for those dyke rocks are unnecessary; it is sufficient to put the respective plutonic rock symbols between the two lines which delimit the dyke. Sill rocks are represented in the same way.

2.1.3 Column 3 is reserved for volcanic rocks. The subdivision corresponds to that of the plutonic rocks.

2.2 Individual symbols

A distinction in the grain size of rocks can be shown by the smaller or greater size of the individual symbols, for example, the difference between coarse-grained syenite and fine-grained syenite can be indicated by the difference in size of the same symbol (see figures 1 and 2).



FIGURE 1 – Coarse-grained syenite



FIGURE 2 – Fine-grained syenite

To indicate porphyritic texture the ordinary symbol is replaced at intervals by a larger symbol (see figure 3).

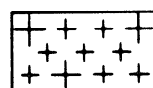


FIGURE 3 – Porphyritic granite or granite porphyry

2.2.1 Plutonic and volcanic rocks

The symbols representing plutonic rocks are derived from a cross (+) or a letter "Y" (see figure 4).

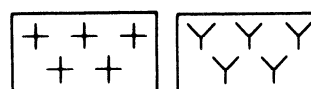


FIGURE 4 – Plutonic rocks

The symbols representing volcanic rocks are derived from a right angle placed on its point (∨) (see figure 5).

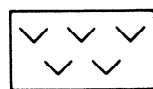


FIGURE 5 – Volcanic rocks

These basic symbols are varied in the same way according to the silica content of the rocks (see table 1).

TABLE 1 – Main types

PLUTONIC ROCKS						VOLCANIC ROCKS			
1	a	b	2		a	b	3		
Rock group	Group Symbol		More differentiated rock types		Symbol		Rock types	Symbol	
1	Alkali-granite						Alkali-rhyolite		
2	Very acid granite						Leucorhyolite		
3	Granite			1	Normal granite			Rhyolite (Liparite)	
				2	Granodiorite			Dacite	
				3	Quartz-diorite			Quartz-andesite	
4	Syenite			1	Alkali-syenite			Alkali trachyte	
				2	Syenite			Trachyte	
				3	Monzonite			Latite	
5	Diorite						Andesite		
6	Gabbro			1	Gabbro			Basalt	
				2	Norite				
				3	Anorthosite				
7	Feldspathoidal plutonic rocks			1	Nepheline-syenite			Phonolite	
				2	Essexite/Theralite			Tephrite	
				3	Ijolite			Feldspathoidal basalt	
8	Ultrabasic rock						Picrite Picrite-basalt		

2.2.2 Alkaline rocks

In the symbols for alkaline rocks, with the exception of feldspathoidal rocks, an open space is always left at the point of intersection of the lines.

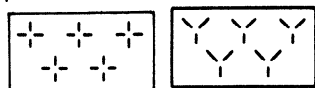


FIGURE 6 – Alkali granite

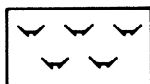


FIGURE 7 – Alkali trachyte

2.2.3 Very acid rocks

To indicate the very acid character of a rock, a point is placed at the centre of the symbol, the lines being interrupted around the point of intersection. This point indicates the high content of quartz. Figure 8 is an example.

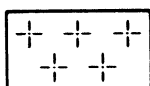


FIGURE 8 – Highly acid granite

2.2.4 Feldspathoidal rocks

The symbols are always asymmetrical, as, for example, in figure 9.



FIGURE 9 – Phonolite

2.2.5 Basic and ultrabasic rocks

With increasing basicity, the lines are thickened so that the darker appearance of the rock is reflected in the symbol. The ratio of the width of thin and thick lines shall be 1 : 3.

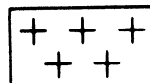


FIGURE 10 – Granite

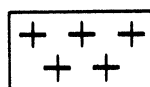


FIGURE 11 – Diorite

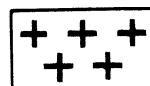


FIGURE 12 – Gabbro

The various types of ultrabasic rocks can be represented by the greater or lesser length of lines in relation to the black square, for example

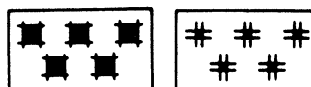


FIGURE 13 – Ultrabasites

2.2.6 Paleo-volcanic and neo-volcanic rocks

Where it seems desirable to distinguish paleo-volcanic rocks from neo-volcanic rocks, the symbol for the former is underlined (see figures 14 and 15).

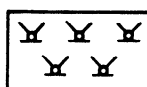


FIGURE 14 – Silicious porphyrite (ancient)

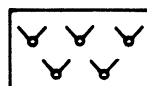


FIGURE 15 – Dacite (recent)

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3 VARIA

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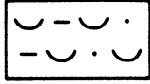
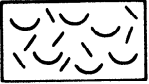
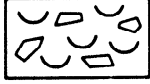


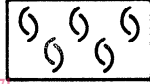
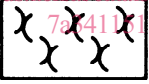
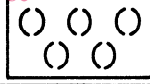
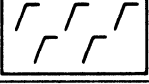
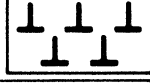

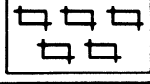

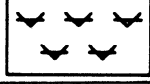


3.1 Principles of representation (see table 2)

Table 2 "Varia" is a complement to table 1 "Main types" (see clause 2). It contains symbols for magmatic rocks which are hardly suitable for the system used in the case of main types.

The table is subdivided into four different groups containing :

- symbols for tuffs;
- symbols for lavas and volcanic glasses;
- symbols for dyke rocks;
- symbols for miscellaneous volcanic rocks.

TABLE 2 - Varia

TUFFS					
101	Unconsolidated tuff (volcanic ash)		102	Tuffite (consolidated)	
103	Crystal tuff (unconsolidated)		104	Volcanic breccia (unconsolidated)	
105	Ignimbrite		106		
LAVAS AND VOLCANIC GLASSES					
201	Pumiceous Lava		202	Obsidian	
203	Perlite		204	Pumice	
DYKE ROCKS					
301	Pegmatite		302	Lamprophyre	
303	Quartz vein		304	Carbonatite	
MISCELLANEOUS VOLCANIC ROCKS					
401	Quartz-keratophyre		402	Keratophyre	
403	Diabase		404	Spilitic volcanic rocks	

3.2 Groups of varia

3.2.1 Tuffs

The group of tuffs is indicated by ornaments Nos. 101 to 105.

3.2.1.1 TUFF (No. 101)

The basic symbols for tuff are arranged differently in the ornament in accordance with the texture of the rock: irregularly for unconsolidated tuff (see figure 16), in rows for stratified tuff (see figure 17) and in alternating rows for consolidated tuff (see figure 18).

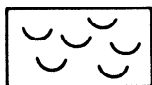


FIGURE 16 – Unconsolidated tuff

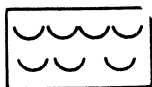


FIGURE 17 – Stratified tuff

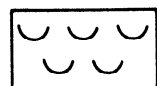


FIGURE 18 – Consolidated tuff

To distinguish between acid and basic tuffs, the symbol is printed lightly or boldly (see figures 19 and 20).

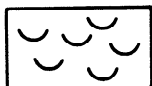


FIGURE 19 – Acid tuff

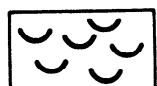


FIGURE 20 – Basic tuff

When the associated volcanic rock is discernible, the rock symbol is inserted here and there (see figure 21).

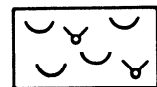


FIGURE 21 – Dacitic tuff (unconsolidated)

3.2.1.2 TUFFITE (No. 102)

In those cases where the sand component predominates in a tuffite, a larger number of points representing sand is inserted in the symbol, and when clay predominates, the number of dashes representing clay is increased (see figures 22 and 23).

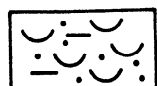


FIGURE 22 – Sandy tuffite (unconsolidated)

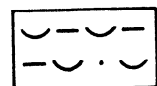


FIGURE 23 – Argillaceous (muddy) tuffite (consolidated)

To represent tuff or tuffite with blocks, symbols are added for volcanic admixtures.

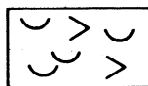


FIGURE 24 – Block tuff (unconsolidated)

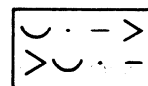


FIGURE 25 – Block tuffite (consolidated)

3.2.1.3 CRYSTAL TUFF (No. 103)

The ornament for crystal tuff is a combination of the symbols for tuff and feldspar. If the porphyritic crystal component is not feldspar, the symbol for feldspar may be replaced by that of the appropriate mineral.

3.2.1.4 VOLCANIC BRECCIA (No. 104)

The ornament for volcanic breccia is composed from the basic symbols for tuff and detritus.

3.2.1.5 IGNIMBRITE (No. 105)

For ignimbrite, which can be regarded as a tuff in the wider sense of the word, a symbol in the form of a double arc open upwards has been reserved.

3.2.2 Lavas and volcanic glasses

The group of lavas and volcanic glasses is indicated by ornaments Nos. 201 to 204.

3.2.2.1 PUMICEOUS LAVA (No. 201)

The symbol proposed for pumiceous lava, in the form of a figure 8 placed horizontally, has been chosen to recall the bubbles in the lava.

3.2.2.2 OBSIDIAN, PERLITE, PUMICE (Nos. 202 to 204)

The symbols for obsidian, perlite and pumice are composed of two elements of identical form combined together differently.

3.2.3 Dyke rocks

The group of dyke rocks is indicated by ornaments Nos. 301 to 304.

3.2.3.1 PEGMATITE (No. 301)

To distinguish between acid and basic pegmatites, the basicity is indicated by the greater thickness of the symbol (see figures 26 and 27).

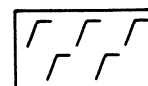


FIGURE 26 – Acid pegmatite

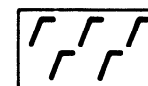


FIGURE 27 – Basic pegmatite