

# ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

## ISO RECOMMENDATION R 710 / III

GRAPHICAL SYMBOLS FOR USE ON DETAILED MAPS,  
PLANS AND GEOLOGICAL CROSS SECTIONS

PART III : REPRESENTATION OF MAGMATIC ROCKS

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## BRIEF HISTORY

The ISO Recommendation R 710/III, *Graphical symbols for use on detailed maps, plans and geological cross sections – Part III : Representation of magmatic rocks*, was drawn up by Technical Committee ISO/TC 82, *Mining*, the Secretariat of which is held by the Deutscher Normenausschuss (DNA).

Work on this question led to the adoption of a Draft ISO Recommendation.

In September 1967, this Draft ISO Recommendation (No. 1293) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	India	Sweden
Belgium	Iran	Turkey
Czechoslovakia	Israel	U.A.R.
France	Italy	United Kingdom
Germany	Netherlands	U.S.S.R.
Greece	Spain	

Five Member Bodies opposed the approval of the Draft :

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Chile  
Hungary  
Ireland  
New Zealand  
South Africa, Rep. of

This Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in March 1970, to accept it as Part III of ISO Recommendation R 710.

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ISO/R 710-3:1970

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**GRAPHICAL SYMBOLS FOR USE ON DETAILED MAPS,  
PLANS AND GEOLOGICAL CROSS SECTIONS**

**PART III : REPRESENTATION OF MAGMATIC ROCKS**

**1. SCOPE**

This ISO Recommendation is intended to unify symbols and ornaments for the representation of magmatic rocks on maps, especially large-scale maps, plans and detailed geological cross-sections.

The symbols may be divided in two groups :

- (1) Main types;
- (2) Varia.

They are reproduced in two Tables derived from a logical system which makes it possible to complete them easily in case of need.

**2. MAIN TYPES**

**2.1 Principles of representation** (see Table 1, page 6)

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 group 7 and group 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 Fig. 1 and 2).

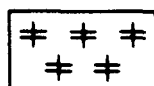


FIG. 1 - Coarse-grained syenite

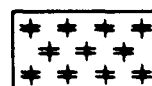


FIG. 2 - Fine-grained syenite

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

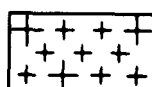


FIG. 3 - Porphyritic granite or granite porphyry

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		

2.2.1 *Plutonic and volcanic rocks.* The symbols representing plutonic rocks are derived from a cross (+) or a letter 'Y' (see Fig. 4).



FIG. 4 - Plutonic rocks

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

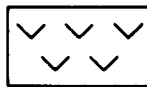


FIG. 5 - Volcanic rocks

These basic symbols are varied in the same way according to the silica content of the rocks (see Table 1, page 6).

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.

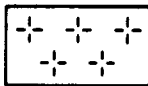


FIG. 6 - Alkali granite



FIG. 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.

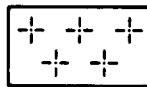


FIG. 8 - Highly acid granite

2.2.4 *Feldspathoidal rocks.* The symbols are always asymmetrical, as, for example, in Figure 9.

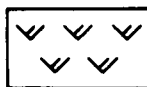


FIG. 9 - Phonolite

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 should be 1 : 3.

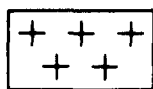


FIG. 10 - Granite

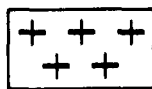


FIG. 11 - Diorite

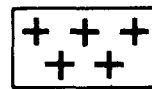


FIG. 12 - Gabbro

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

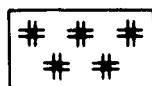
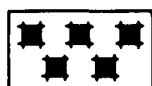


FIG. 13 - Ultrabasites

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

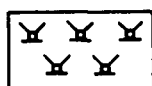


FIG. 14 - Silicious porphyrite (ancient)

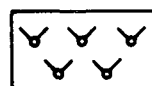


FIG. 15 - Dacite (recent)

### 3. VARIA

#### 3.1 Principles of representation (see Table 2, page 9)


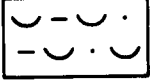

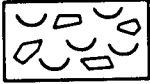

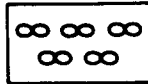
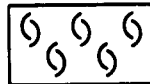
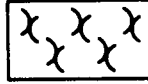
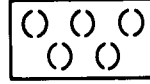

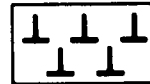

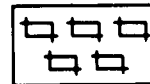




Table 2 "Varia" is a complement to Table 1 "Main types" (see section 2). It contains symbols for magmatic rocks which are hardly suitable for the system used in the case of main types.

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 symbols No. 101 to 105.

3.2.1.1 **TUFF** (symbol 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 Fig. 16), in rows for stratified tuff (see Fig. 17) and in alternating rows for consolidated tuff (see Fig. 18).

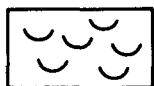


FIG. 16 - Unconsolidated tuff

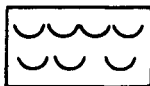


FIG. 17 - Stratified tuff

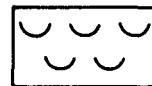


FIG. 18 - Consolidated tuff

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

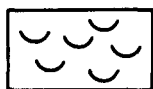


FIG. 19 - Acid tuff

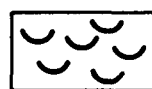


FIG. 20 - Basic tuff

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

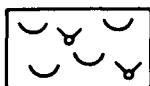


FIG. 21 - Dacitic tuff (unconsolidated)

3.2.1.2 **TUFFITE** (symbol 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 Fig. 22 and 23).

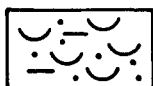


FIG. 22 - Sandy tuffite (unconsolidated)

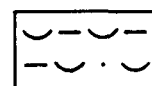


FIG. 23 - Argillaceous (muddy) tuffite (consolidated)

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

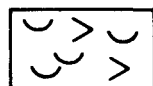


FIG. 24 - Block tuff (unconsolidated)

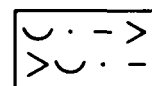


FIG. 25 - Block tuffite (consolidated)

3.2.1.3 **CRYSTAL TUFF** (symbol 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** (symbol No. 104). The ornament for volcanic breccia is composed from the basic symbols for tuff and detritus.

3.2.1.5 **IGNIMBRITE** (symbol 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.