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**Mechanical pencils —**

**Part 2 :**  
**Black leads — Classification and dimensions**

*Porte-mine —*

*Partie 2: Mines graphite — Classification et dimensions*



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International Standard ISO 9177-2 was prepared by Technical Committee ISO/TC 10, *Technical drawings*.

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# Mechanical pencils —

## Part 2 :

## Black leads — Classification and dimensions

### 1 Scope and field of application

This part of ISO 9177 specifies a classification and dimensions for black leads used for mechanical pencils.

Two types of black leads are available :

- polymer leads (designated by the letter "P")
- ceramic leads (designated by the letter "C")

### 2 References

ISO 128, *Technical drawings — General principles of presentation*.

ISO 9177-1, *Mechanical pencils — Part 1 : Classification, dimensions, performance requirements and testing*.

### 3 Definitions

For the purposes of this part of ISO 9177, the definition given in ISO 9177-1 and the following definitions apply.

**3.1 black lead** : Solid writing material which consists of carbon (e.g. graphite) and a binding agent. The lead generates black lines which are erasable.

**3.1.1 polymer lead** : Black lead in which the binding agent is an organic polymer.

**3.1.2 ceramic lead** : Black lead in which the binding agent is clay.

**3.2 hardness degree** : Classification indicating increasing hardness from 6B to 9H and increasing line density from 9H to 6B. The median hardness degree is HB.

NOTE — A scientific definition of hardness degree is not yet available.

### 4 Classification

Leads shall be classified according to the hardness degree (see table 1), to the nominal diameter (see clause 5) and to the type of black lead (i.e. polymer or ceramic).

Table 1 — Classification according to hardness degree

Nominal diameter mm	Hardness degree (see 3.2)
0,35 0,5 0,7 1	6H, 5H, 4H, 3H, 2H, H, F, HB, B, 2B
2	9H, 8H, 7H, 6H, 5H, 4H, 3H, 2H, H, F, HB, B, 2B, 3B, 4B, 5B, 6B

### 5 Dimensions

#### 5.1 Diameters

Lead diameters shall be as specified in table 2.

NOTE — This table 2 is identical to table 2 in ISO 9177-1.

Table 2 — Diameters

Dimensions in millimetres

Line thickness according to ISO 128	Lead diameter	
	Nominal diameter	Actual diameter and tolerance of the mechanical pencil lead
0,25 <sup>1)</sup>	—	—
0,35	0,35 <sup>2)</sup>	0,35 +0,04 +0,02
0,5	0,5	0,5 +0,08 +0,05
0,7	0,7	0,7 +0,03 -0,01
1	1 <sup>2)</sup>	1 -0,08 -0,12
1,4 <sup>1)</sup>	—	—
2	2	2 ±0,05

1) At present the corresponding leads are not available.

2) Current practice is to label or mark mechanical pencils and boxes 0,3 and 0,9 as applicable. The user should note that leads with new standardized designations apply perfectly well to pencils with the old designations and vice versa; i.e. 0,35 and 1 correspond respectively to 0,3 and 0,9.