INTERNATIONAL STANDARD

ISO 9177-2

First edition
1989-03-15

Mechanical pencils —

Part 2 :
Black leads — Classification and dimensions

Porte-mine —

Partie 2: Mines graphite — Classification et dimensions

Reference number
ISO 9177-2 : 1989 (E)

This document is a preview generated by EVS

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 approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

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

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

© ISO 1989
All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Mechanical pencils —

Part 2 :
Black leads — Classification and dimensions

This document is a preview generated by EVS

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 [1]	—	—
0,35	**0,35** [2]	$0,35^{+0,04}_{+0,02}$
0,5	**0,5**	$0,5^{+0,08}_{+0,05}$
0,7	**0,7**	$0,7^{+0,03}_{-0,01}$
1	**1** [2]	$1^{-0,08}_{-0,12}$
1,4 [1]	—	—
2	**2**	$2 \pm 0,05$

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.