
**Coated abrasives — Determination
and designation of grain size
distribution —**

**Part 2:
Macrogrit sizes P12 to P220**

iTeh STANDARD PREVIEW
*Abrasifs appliqués — Détermination et désignation de la distribution
granulométrique —
(standards.iteh.ai)
Partie 2: Macrograins P12 à P220*

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 5, *Grinding wheels and abrasives*.

This second edition cancels and replaces ISO 6344-2:1998 and ISO 6344-1:1998, which have been technically revised.

The main changes compared to ISO 6344-2:1998 and ISO 6344-1:1998 are as follows:

- the title and the scope have been changed editorially;
- relevant content of ISO 6344-1:1998 has been updated and transferred to this document and ISO 6344-3;
- references to ISO 6344-1:1998 have been deleted;
- [Clause 3](#) "Terms and definitions" has been updated;
- a new [Clause 4](#) for macrogrit sizes has been added;
- [Table 1](#) (former Table 2) "Grain size distribution of macrogrit sizes P12 to P220" has been moved to the new [Clause 4](#);
- former [Table 1](#) with a summary of nominal sizes of openings of test sieves has been deleted;
- [Clause 5](#) (former [Clause 4](#)) "Test method of macrogrit sizes P12 to P220" has been revised in its content and order;
- [5.6](#) (former [5.3](#)) "Evaluation" has been revised by giving a normative description of the procedure for the determination of a sieving analysis and evaluation of the results;
- former [Clause 8](#) has been moved to a new [Annex A](#) "Template for recording results of sieving analysis of macrogrit P sizes";
- [Clause 8](#) (former [Clause 7](#)) "Marking" has been revised.

A list of all parts in the ISO 6344 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Coated abrasives — Determination and designation of grain size distribution —

Part 2: Macrogrit sizes P12 to P220

1 Scope

This document specifies a method for determining and testing the grain size distribution of electrofused aluminium oxide and silicon carbide macrogrit sizes P12 to P220 for coated abrasive products.

It is applicable to grits used in the manufacture of coated abrasive products and to grits extracted from coated abrasive products for test purposes.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 3310-1, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

ISO 9138, *Abrasive grains — Sampling and splitting*

ISO 9284, *Abrasive grains — Test-sieving machines*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

macrogrit

abrasive grit having a diameter of 3,35 mm to 0,053 mm whose *grain size distribution* (3.2) is determined by sieving

3.2

grain size distribution

particle size distribution

PSD

percentage of grains of different sizes composing the *macrogrit* (3.1) or microgrit

4 Grain size distribution of macrogrit sizes P12 to P220

Macrogrit sizes (P12 to P220) are measured by a sieving analysis, using a set of sieves as specified in [Table 1](#). The test portion matches the P size in [Table 1](#) when the calculated relative amount fits into the limit values.

The testing of macrogrit sizes shall be carried out by a comparative sieving of Macro-P-Mastergrits (5.1.1) and the test portion on the same nest of sieves according to [Clause 5](#).

The grain size distribution of grits shall meet the following criteria:

- a) all material shall pass test sieve i.e. the residue $Q_1=0$;
- b) the residue Q_2 shall not exceed the maximum value specified for test sieve 2;
- c) the sum Q_3 of the residues on test sieves 1, 2 and 3 and the sum Q_4 of the residues on test sieves 1, 2, 3 and 4 shall be within the specified tolerances;
- d) the sum Q_5 of the residues on test sieves 1, 2, 3, 4 and 5 shall not be less than the specified minimum value;
- e) the remainder in the bottom pan shall not exceed the specified maximum value, ΔQ_{\max} .

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Table 1 — Grain size distribution of macrogrit sizes P12 to P220

Grit designation	Test sieve 1		Test sieve 2		Test sieve 3		Test sieve 4		Test sieve 5		Remainder in bottom pan
	Aperture size sieve 1	Residue on test sieve 1	Aperture size sieve 2	Residue on test sieves 1 and 2	Aperture size sieve 3	Residue on test sieves 1, 2 and 3	Aperture size sieve 4	Residue on test sieves 1, 2, 3 and 4	Aperture size sieve 5	Residue on test sieves 1, 2, 3, 4 and 5	
	w_1 mm μm	Q_1 %	w_2 mm μm	$Q_{2,\text{max}}$ %	w_3 mm μm	Q_3 %	w_4 mm μm	Q_4 %	w_5 mm μm	$Q_{5,\text{min}}$ %	ΔQ_{max} %
P12	3,35	0	2,36	1	2,00	14 ± 4	1,70	61 ± 9	1,40	92	8
P16	2,36	0	1,70	3	1,40	26 ± 6	—	75 ± 9	1,00	96	4
P20	1,70	0	1,18	7	1,00	42 ± 8	—	86 ± 6	—	96	4
P24	1,40	0	1,00	1	—	14 ± 4	850	61 ± 9	—	92	8
P30	1,18	0	—	1	850	14 ± 4	710	61 ± 9	—	92	8
P36	1,00	0	—	1	—	14 ± 4	600	61 ± 9	—	92	8
P40	—	0	—	7	—	42 ± 8	425	86 ± 6	—	96	4
P50	—	0	—	3	—	26 ± 6	355	75 ± 9	—	96	4
P60	—	0	—	1	—	14 ± 4	300	61 ± 9	—	92	8
P80	—	0	—	3	—	26 ± 6	212	75 ± 9	—	96	4
P100	—	0	—	1	—	14 ± 4	180	61 ± 9	—	92	8
P120	—	0	—	7	—	42 ± 8	125	86 ± 6	—	96	4
P150	—	0	—	3	—	26 ± 6	106	75 ± 9	—	96	4
P180	—	0	—	2	—	15 ± 5	90	62 ± 12	—	90	10
P220	—	0	—	2	—	15 ± 5	75	62 ± 12	—	90	10

5 Test method of macrogrit sizes P12 to P220

5.1 Macro-P-Mastergrits

Macro-P-Mastergrits¹⁾ are well-defined reference grits, being associated with test reports of the grain size distribution. The test reports shall be determined in cooperative interlaboratory tests. These cooperative interlaboratory tests shall be supervised by an independent institution like for example the MPA¹⁾. This institution is responsible for defining the values in the test reports.

The apparatus for measuring the values of grain size distribution shall be a test sieving machine according to [5.2.1](#).

The Macro-P-Mastergrits are used for the comparative sieving procedure for testing for coated abrasive products.

The grain size distribution of the Macro-P-Mastergrits is specified in [Table 1](#), with the tolerances for Q_3 and Q_4 being only half of the indicated value in [Table 1](#) (e.g. for P20, the tolerance of Q_3 is ± 4). Each supply of Macro-P-Mastergrits shall be accompanied by a test report giving the sieving analysis and the respective date of test of the Macro-P-Mastergrits.

The Macro-P-Mastergrits are made of fused aluminium oxide. They shall be checked on a test sieving machine according to [5.2.1](#), with their precisely calibrated series of test sieves. These test sieves correspond to the nominal dimensions of the aperture sizes in accordance with the test sieve designation in [Table 1](#). They are optically measured and considered as reference basis for the testing of grain sizes for coated abrasive products.

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5.2 Apparatus

5.2.1 Test sieving machine, shall be in accordance with ISO 9284 giving reproducible and comparable results.

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EXAMPLE RO-TAP® test sieving machines are examples of a suitable product available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of these products.

5.2.2 Time switch, controlling the test sieving machine for a period of 5 min. The permissible accuracy shall be ± 5 s.

5.2.3 Balance, with an accuracy not less than $\pm 0,1$ g shall be used.

5.2.4 Utility test sieves, with openings specified in [Table 1](#). They shall be in accordance with ISO 3310-1.

5.3 Checking of the common use utility test sieves

Common use utility test sieves shall be free from visible defects such as textural flaws (gaps, broken wires etc.), insufficient tension of the fabric, distortions of the frame (out of roundness, leaks and soldering defects) and free from blinding as these will impair the sieving results.

Macro-P-Mastergrits shall be used for checking the serviceability of these test sieves within the meaning of this document. They shall achieve reproducible test results in the test with Macro-P-Mastergrits.

1) Macro-P-Mastergrits can be obtained by: State Materials Testing Institute Darmstadt (Staatliche Materialprüfungsanstalt Darmstadt, MPA), Grafenstraße 2, D-64283 Darmstadt, Germany. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.