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Coated abrasives — Determination and designation of grain size distribution —

Part 2:
Macrogrit sizes P12 to 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 the following URL: 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 the first edition (ISO 6344-2:1998), which has been technically revised.

The main changes compared to the previous edition are as follows:

— Title has been changed editorially;

— Relevant content of the withdrawn ISO 6344-1:1998 has been updated and transferred to this part and ISO 6344-3;

— References to the withdrawn ISO 6344-1:1998 have been deleted;

— Clause 3 “Terms and definitions” has been updated;

— 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.

— Clause 5 (former Clause 4) “Test equipment and auxiliary device” has been revised in its content and order;

— Subclause 6.3 (former subclause 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.

— The former Clause 8 has been moved to a new Annex A (informative);

— 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.

Coated abrasives — Determination and designation of grain size distribution —

Part 2:
Macrogrit sizes P12 to P220

1 Scope

This part of ISO 6344 defines terms and definitions and specifies a method for determining and testing the grain size distribution of electro-fused aluminium oxide and silicon carbide macrogrit sizes P12 to P220 for coated abrasive products.

It applies 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 terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
macrogrit
abrasive grit having a diameter of 3,35 mm to 0,053 mm whose grain size distribution is determined by sieving

3.2
grain size distribution
particle size distribution
PSD
percentage of grains of different sizes composing the macrogrit or microgrit

4 Grain size distribution of macrogrit sizes

Macrogrit sizes are measured by a sieving analysis, which is based on a defined set of sieves. The macrogrit matches all P sizes (P12 to P220) when the calculated relative amount fits into the limits (see Table 1).

The testing of macrogrit sizes shall be carried out by a comparative sieving of Macro-P-Mastergrits[1)] and the test portion on the same nest of sieves according Clause 5.

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

— all material should pass test sieve i.e. the residue Q_1=0;

— the residue Q_2 does not exceed the maximum value specified for test sieve 2,

— 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 are within the specified tolerances,

— the sum Q_5 of the residues on test sieves 1, 2, 3, 4 and 5 is not less than the specified minimum value,

— the remainder in the bottom pan should not exceed the specified maximum value ΔQ_{max}.

1) 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 part of ISO 6344 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.

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 w_1		Residue on test sieve 1 Q_1	Aperture size sieve 2 w_2		Residue on test sieves 1 and 2 Q_2 max.	Aperture size sieve 3 w_3		Residue on test sieves 1, 2 and 3 Q_3	Aperture size sieve 4 w_4		Residue on test sieves 1, 2, 3 and 4 Q_4	Aperture size sieve 5 w_5		Residue on test sieves 1, 2, 3, 4 and 5 Q_5 min.	ΔQ max.
	mm	µm	%	mm	µm	%	mm	µm	%	mm	µm	%	mm	µm	%	%
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	1,18	—	75 ± 9	1,00	—	96	4
P20	1,70	—	0	1,18	—	7	1,00	—	42 ± 8	—	850	86 ± 6	—	710	96	4
P24	1,40	—	0	1,00	—	1	—	850	14 ± 4	—	710	61 ± 9	—	600	92	8
P30	1,18	—	0	—	850	1	—	710	14 ± 4	—	600	61 ± 9	—	500	92	8
P36	1,00	—	0	—	710	1	—	600	14 ± 4	—	500	61 ± 9	—	425	92	8
P40	—	710	0	—	500	7	—	425	42 ± 8	—	355	86 ± 6	—	300	96	4
P50	—	600	0	—	425	3	—	355	26 ± 6	—	300	75 ± 9	—	250	96	4
P60	—	500	0	—	355	1	—	300	14 ± 4	—	250	61 ± 9	—	212	92	8
P80	—	355	0	—	250	3	—	212	26 ± 6	—	180	75 ± 9	—	150	96	4
P100	—	300	0	—	212	1	—	180	14 ± 4	—	150	61 ± 9	—	125	92	8
P120	—	212	0	—	150	7	—	125	42 ± 8	—	106	86 ± 6	—	90	96	4
P150	—	180	0	—	125	3	—	106	26 ± 6	—	90	75 ± 9	—	75	96	4
P180	—	150	0	—	106	2	—	90	15 ± 5	—	75	62 ± 12	—	63	90	10
P220	—	125	0	—	90	2	—	75	15 ± 5	—	63	62 ± 12	—	53	90	10

5 Test equipment and auxiliary device

5.1 Test sieving machine

The test shall only be carried out with test sieving machines giving reproducible and comparable results, e.g. RO-TAP test sieving machines in accordance with ISO 9284.

5.2 Time switch

A time switch shall be used to control the test sieving machine for a period of 5 min. The permissible accuracy shall be ±5 s.

5.3 Balance

Balances with an accuracy not less than ±0,1 g shall be used.

5.4 Macro-P-Mastergrits

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 certificate indicating 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 in accordance with 4.2.1, 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.

5.5 Utility test sieves

Utility test sieves are test sieves for the internal operational testing of macrogrit sizes for coated abrasive products. The nominal sizes of the openings of test sieves given in Table 2 shall be used. They represent a selection of the test sieves according to ISO 3310-1.

Table 2 — Nominal sizes of openings of test sieves

Nominal sizes of openings of test sieves	
mm	µm
3,35	
2,36	
2,00	
1,70	
1,40	
1,18	
1,00	

Table 2 *(continued)*

Nominal sizes of openings of test sieves	
mm	µm
	850
	710
	600
	500
	425
	355
	300
	250
	212
	180
	150
	125
	106
	90
	75
	63
	53

The checking of the serviceability of the test sieves is described in Clause 5.

5.6 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 standard. They must achieve reproducible test results in the test with Macro-P-Mastergrits.

The utility test sieve to be tested shall be mounted into the respective nest of sieves as the 3rd sieve. The 1st sieve and the 2nd sieve shall be checked sieves. The sum of the residues on the 1st, 2nd and 3rd sieve each shall not deviate from the certified Macro-P-Mastergrit value by more than 1,5 times the tolerance according to Table 1.

Sieves which cannot be inserted as 3rd sieve when assembled in the nest of test sieves according to Table 1, shall be tested as 4th sieve. In this case it shall be ensured that the 1st, 2nd and 3rd sieves are checked sieves. The sum of the residues on test sieves 1, 2, 3 and 4 each shall be within 1,5 times the tolerance according to Table 1 for the certified Macro-P-Mastergrit value.

After this test, a sieve is considered as not suitable if the sum of the residues on the 1st, 2nd, and 3rd or on the 1st, 2nd, 3rd and 4th sieve respectively exceeds the permissible deviations of Table 1 by more than half the value. The sum of the residues of the Macro-P-Mastergrit on the 1st, 2nd and 3rd sieve or on the 1st, 2nd, 3rd and 4th sieve as certified is applicable as the reference value.

The sieves marked with 3,35 mm, 2,36 mm and 53 µm shall be tested according to ISO 3310-1.