

Identification File of Type ZE64G23 for use in oil

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MEIDENSHA CORPORATION

Identification File

1. Category

Zinc oxide block described in this file is applied to the arrester for use in oil.

2. Structure

(a) General

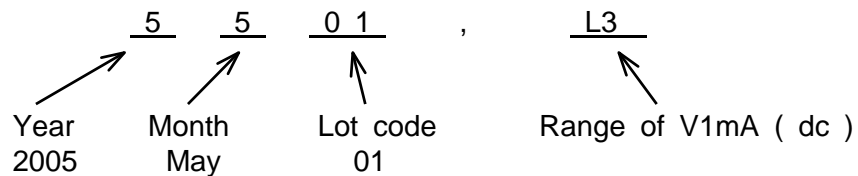
The side surface of block is covered with high resistance layers.
The both contact surfaces are spray coated with aluminum.

(b) Dimension and reference number

Reference Number	Dimension (mm)		Volume (cm ³)	Weight (g)
	Diameter	Thickness		
ZE64G23	64.5 ± 1.0	22.5 ± 1.0	73.6 ± 5.6	407 ± 36

(c) Indication

Following figures are indicated on each block.



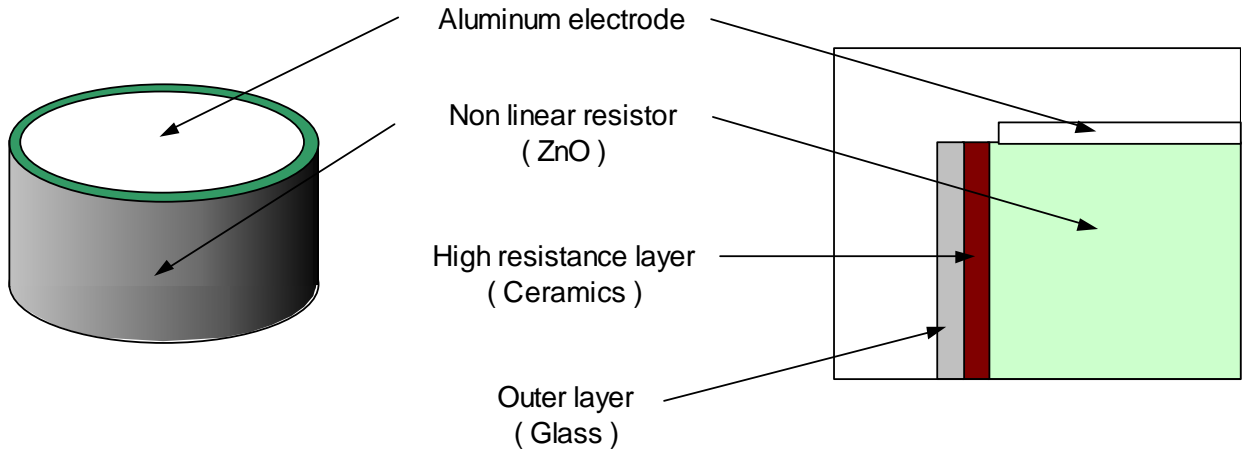
(Note)

1. The month of October, November and December are indicated as X, Y, and Z respectively.
2. Range of V1mA (dc) is shown as follows.

Range of V1mA (dc)

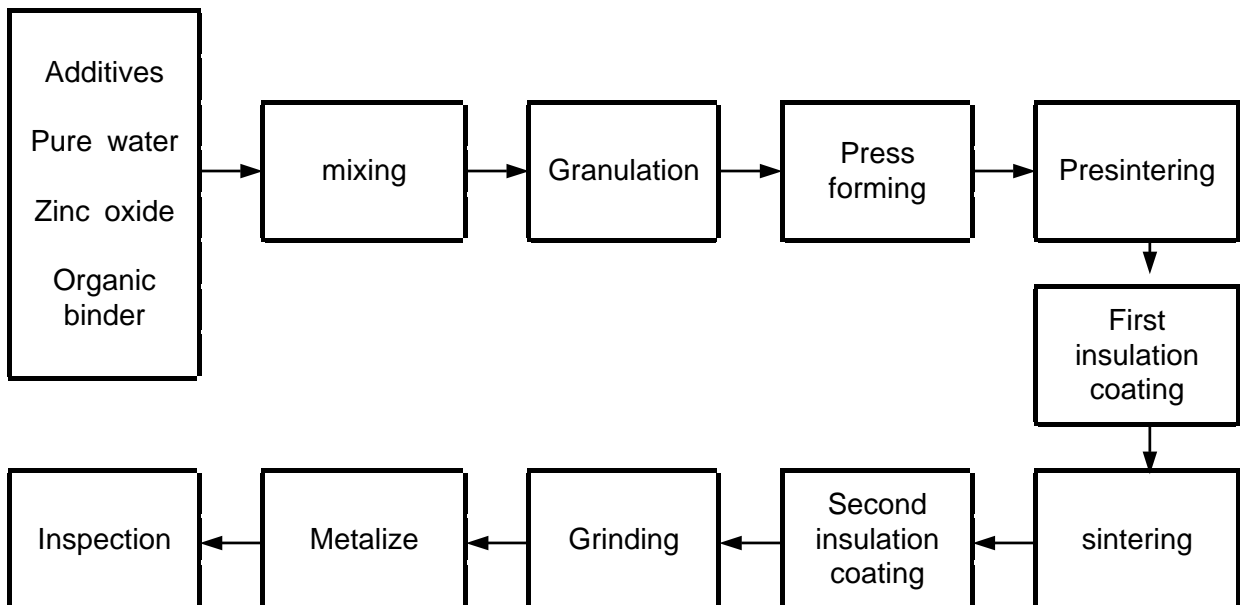
Type	V1mA (dc) (kV)	Range
ZE64G23	4.28 ~ 4.32	L4
	4.33 ~ 4.37	L3
	4.38 ~ 4.42	L2

(d) Construction
The block consists of following parts



3. Manufacturing process

Zinc oxide, additives of Bi_2O_3 , Co_3O_4 , MnO_2 , Cr_2O_3 , Sb_2O_3 , etc. and pure water are mixed and granulated. After granulation, press forming and sintering were performed. The manufacturing flow is as follows.



4. Manufacturing control

The quality system meets the requirements laid down in the International Standard ISO 9001.

5. Shop and acceptance test

5.1 Test procedure

(a) Dimension and appearance test

This test shall be carried out in the in-process inspection.

(b) Reference voltage test

Reference voltage defined as terminal voltage across ZnO block when d.c. 1mA begins to flow.

This test shall be carried out promptly in order to avoid heat generation of blocks and this test shall be made at a block temperature of 20 to 25 .

(c) Residual voltage test

Residual voltage at current impulse with 8/20us, 10kA shall be measured.

(d) Discharge current withstand capability

(i) High current impulse

The current impulse with 4/10us, 100kA shall be applied to the block for 2 times.

The interval between impulses shall be long enough for the block to be cooled down to the ambient temperature.

(ii) Rectangular current impulse

The 2ms rectangular current impulse with 1,000A shall be applied to the block for 20 times . These divided into 4 groups of 5 impulses. The interval between impulses shall be 50 to 60 seconds and the interval between groups shall be long enough for the block to be cooled down to the ambient temperature.

5.2 Sampling procedure

Sampling procedure shall be carried out in accordance with MIL - STD - 105E.

Test item	Number of samples	Remarks
Reference voltage and external appearance	all blocks	In process inspection
Residual voltage ratio at a specified current value	5 blocks / lot	MIL-STD-105E , S-2 Double sampling plan AQL = 6.5 %
High current impulse withstand	5 blocks / lot	MIL-STD-105E , S-2 Double sampling plan AQL = 6.5 %
Rectangular current impulse withstand	5 blocks / lot	MIL-STD-105E , S-2 Double sampling plan AQL = 6.5 %
Dimension check	50 blocks / lot	MIL-STD-105E , S-4 Single sampling plan AQL = 1.0 %

The double sampling plan shall be as follows.

First sampling test

Good	No good	Evaluation
5	0	Acceptable
4	1	Re-sampling
0 - 3	2 - 5	Not acceptable

Re-sampling test (total)

Good	No good	Evaluation
9	1	Acceptable
4 - 8	2 - 6	Not acceptable

The single sampling plan shall be as follows.

Sampling test

Good	No good	Evaluation
49 - 50	0 - 1	Acceptable
0 - 48	2 - 50	Not acceptable

(Note)

1. Reference voltage test and external appearance check shall be carried out on each ZnO block in the in process inspection.
2. The number of samples shall be based on 5,000 blocks.

6. Electrical characteristics

(a) Rated discharge current	10 kAcrest
(b) MCOV in oil up to 110	1.6 kVrms
(c) Reference voltage (at 25)	
V1mA (ac)	4.13 ~ 4.42 kVcrest
[V1mA (dc)	4.28 ~ 4.42 kVcrest]
(d) Power consumption at MCOV (at 90)	
Average	0.27 w
Max.	0.41 w
Power consumption (average) - Temperature characteristic	Refer to Fig.1
(e) Resistive current at MCOV (at 90)	
Average	0.27 mAcrest
Max.	0.41 mAcrest
Resistive current (average) - Temperature characteristic	Refer to Fig.2
(f) Total leakage current at MCOV (at 90)	
Average	0.67 mArms
Max.	1.00 mArms
Total leakage current (average) - Temperature characteristic	Refer to Fig.3
(g) Life cycle	
Accelerated ageing test result	Refer to Fig.4
(h) Residual voltage ratio at 10 kA	
Average	1.65 (-)
Max.	1.69 (-)
Residual voltage ratio - discharge current characteristics	Refer to Fig.5
Protective characteristics (Average value)	Refer to Fig.6
(i) High current withstand capability	100 kAcrest – 2 shots
(j) Rectangular current withstand capability	1,000 A – 20 shots
Absorbed energy – discharge current characteristic	Refer to Fig.7
Discharge current – applicable number characteristic	Refer to Fig.8

7. Other information

7.1 Minimum contact pressure of blocks

The minimum contact pressure of blocks shall be 10 kg.

7.2 Working capability

The working capability of blocks are defined by the weight of granulation powder at Meidensha.

The working capability of Meidensha is about 600 tons per year (as of August 1993).

