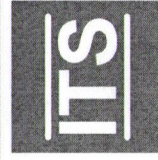


Desiccant; Indicating Silica Gel for Transformer Breather

Technical Terms of Delivery



IRAN TRANSFO STANDARD
Research & Development Department

Compiled:
A. Bagheri

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H. Nemati

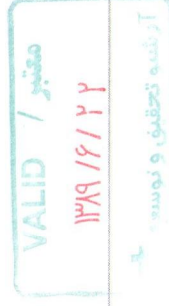
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FOREWORD

The Iran Transfo Standard (ITS) is a group of documents for standardization of Iran-Transfo Company requirements. Their preparation is entrusted to technical committees; any committee interested in the subject dealt with may participate in this preparatory work.

Preparation of this standard has been incepted in R&D Department with close collaboration of Mr. nazari, Mr. parvizi and Mrs. Bakhtiyari from QC Dept. Eventually discussed in Chemical committee and by approve of following members issued:

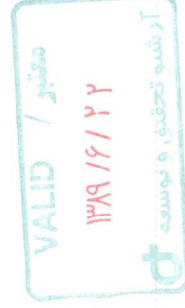
✓ Nemati	✓ Bakhtiyari	✓ Mirzaei	✓ Najafi
✓ Bagheri	✓ Ghasemloo	✓ Mohammadi (Elmira)	
✓ Bakeri	✓ Rahmati	✓ Mohammadi (Mohsen)	

All users should ensure that they have the latest edition of this publication, by referring to:
<http://www.research.iran-transfo.com>.



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4 Tests

- Sampling, and preparation and storage of test samples acc. to BS 3482 : Part 1
- Determination of moisture content acc. to BS 3482 : Part 2
- Determination of pH acc. to BS 3482 : Part 3
- Determination of adsorptive capacity acc. to BS 3482 : Part 6
- Determination of particle size acc. to BS 3482 : Part 7
- Determination of bulk density acc. to BS 3482 : Part 10
- Determination of friability and dust content acc. to BS 3482 : Part 11

5 Packaging

The material shall be supplied in sound, clean and dry containers, which are airtight and capable of being resealed so as to avoid absorption of moisture from the atmosphere.

NOTE: The following packaging materials are recommended:

- for bulk material:
 - steel drums with sealing gaskets;
 - fibreboard drums or boxes with closeable liners of aluminium foil laminate or polyethylene.
- for small packages: metal tubes with screw caps.

6 Labeling

Container and packaging shall be marked at least with the following information:

- The color change of silica gel after moisture absorption
- The number and date of this ITS-Standard, i.e. ITS-MC29-01: 2010-09¹;
- The statement 'Not to be opened until required for use'
- Order No.
- Date of manufacturing.
- Gross and net weight.

7 Normative References

The following documents have been used for preparation of this standard:

BS 2540:1991

Specification for granular desiccant silica gel

BS 3482:1991

Methods of test for desiccants.



¹ Labeling ITS-MC29-01: 2010-09 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party of conformity, which may also be desirable.

1 Scope

These technical terms of delivery specifies requirements for silica gel for use as a Desiccant. This material is suitable for use in dehydrating breather of oil filled transformers and reactors equipped with oil conservator.

The silica gel should absorb and dry out the moisture of the breathed air into the conservator.

2 Designation

Desiccant - silica gel, with moisture indicator and Particle shape Spherical

ITS-MC29-01 – Silica gel – S

Desiccant - silica gel, with moisture indicator and Particle shape Non-Spherical

ITS-MC29-01 – Silica gel – NS

3 Specifications

3.1 Compound

The indicator shall be environmental friendly and doesn't contain any heavy metals such as cobalt.

3.2 Characteristics

3.2.1 Indicator

The color change of indicator shall be sensible. For example, the following color changes can be acceptable:

Colour when dry	Colour when wet
Orange /Yellow	Green, Dark green

3.2.2 UV Resistant

Since the silica gel is exposed to sunlight and UV during the lifetime of transformer, indicator shall be stable against sunlight and UV.

3.3 Technical data

Descriptions		Specification
Absorption capacity at 25 °C	@ 10% RH	>= 6 wt%
	@ 20% RH	>= 9 wt%
	@ 50% RH	>= 22 wt%
	@ 80% RH	>= 30 wt%
Color Variation	@ 20% RH	Orange-Light Orange
	@ 50% RH	Light Orange- Light Green
	@ 90% RH	Dark Green
Bulk density		0.67 – 0.82 g/cm ³
Size qualification ratio		At least 97%
Moisture content at delivery condition		≤ 2%
Loss on drying		≤ 2%
Particle size	Non-Spherical (Beads)	3 to 6 mm
	Spherical (Granule)	2 to 5 mm

