

# Resistance measurement and material qualification of acrylonitrile butadiene rubber

## - Version NBR-ESD -

### Preamble

This document informs about the determination of the contact resistance of the material NBR-ESD. It describes the theoretical procedure of measurements and determination of the resistance value of raw material in the form of test plates and further processed material for different suction pad geometries of the Schmalz GmbH. Continuous quality assurance and production monitoring are subject to the routines documented in DIN EN ISO9001 and are not part of this document. The measurements are based on the standard

DIN EN 61340-2-3 / *Electrostatics - Part 2-3: Methods of test for determining the resistance and resistivity of solid materials used to avoid electrostatic charge accumulation (IEC 61340-2-3:2016)*

These measurements are in-house tests.

### Information

The resistance range of the NBR-ESD material provided by Schmalz is basically determined in two different ways:

1. Determination of the contact resistance on a standardized material test plate (26.08.03.00262)
2. Determination of the contact resistance of the vacuum suction pads under vacuum

Both test methods are non-destructive and are carried out with the aid of fixtures and test equipment which is subject to the test equipment test according to DIN EN ISO9001.

The electrostatic behavior of materials is influenced by ambient conditions such as relative humidity and temperature. Tests are carried out under room temperature and approx. 50% humidity.

### Certificate

The tests carried out by Schmalz have shown that

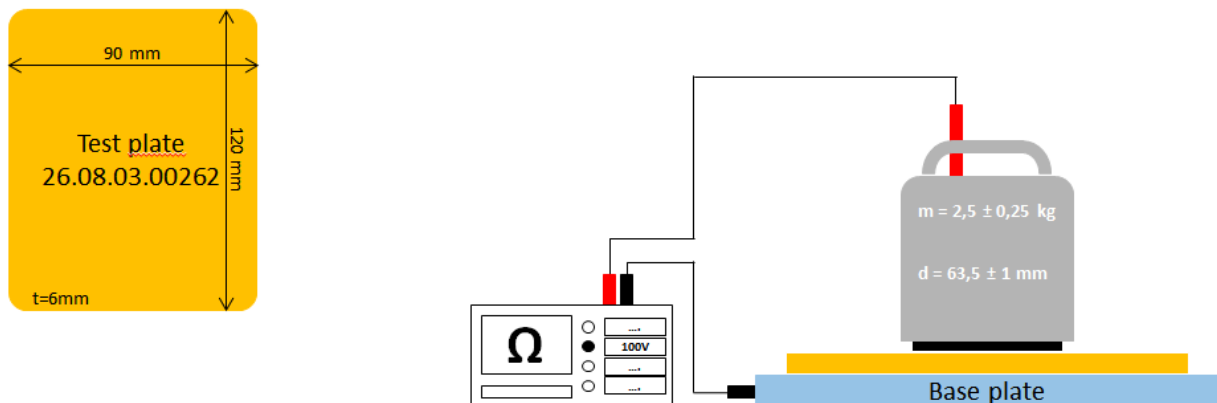
***the resistance range of the NBR-ESD material between  $1 \times 10^6 \Omega$  and  $1 \times 10^9 \Omega$***

can be determined independently of cup size and geometry. Testing the raw material on the basis of the test plate gives the same results. A change in resistance due to wear is not to be expected. External influences shall be taken into account.

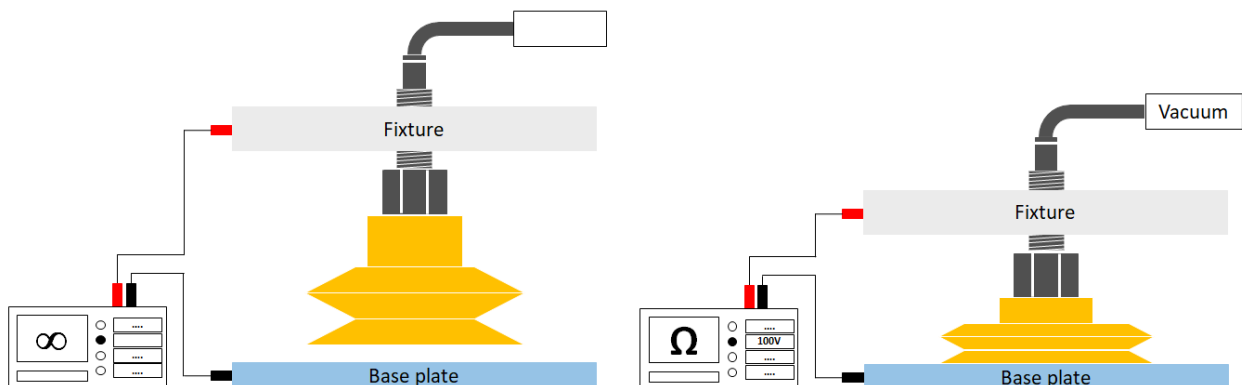
Conductive soot is not an ingredient of the material recipe.

## Measurement setup and testing




### DETERMINATION OF THE CONTACT RESISTANCE ON A STANDARDIZED MATERIAL TEST PLATE (26.08.03.00262)



### DETERMINATION OF THE LEAKAGE RESISTANCE OF THE VACUUM SUCTION PADS UNDER VACUUM



#### Test-Details

Testing Unit   Device	Type: Gossen Metrawatt METRISO BASE Test equipment testing according to DIN EN ISO9001   quality processes	
Testing Unit (Test plate)	Wendeelektrode Modell 890 (IEC 61340-2-3   IEC 61340-4-1)	
Testing Unit (Vacuum-suction cups)	Jig and fixture construction   Manufacturer J. Schmalz GmbH   Article-no. 27.04.07.07010F	
Ambient- and test-conditions	Temperature 19-21°C   Humidity 50%   Testvoltage 100 V   Underpressure -600mbar for suction cups	