

Security Advice: MTC Protection Covers (Patent No. EP1391404)

About MTC Protection Covers

euroTECH's MTC Protection Covers have been developed for the purpose of mark-free handling of coated and uncoated glass, and are designed to slip over euroTECH Suction Cup Seals. MTC Protection Covers are produced from an oil and silicone-free polyethylene material.

Reasons for Marks on Glass

Chemicals and diluents used in the manufacture and fabrication of rubber and rubber products result in a material that cannot be guaranteed to be 100% mark free. When rubber comes into contact with glass these chemicals can transfer to the glass surface, evaporate and leave visible marks. Negative chemical reactions can occur on coated glass surfaces. Additionally, the geometry of the Suction Cup rubber lip may cause friction damage during glass transport.

Advantage of MTC Protection Covers

Rubber marks may be prevented by the proper usage of euroTECH MTC Protection Covers, provided they are clean and in good condition.

Some reference values of euroTECH seals in NBR black. Tested on a glass sheet in vertical orientation (60% vacuum, without safety factor, constant traction speed):

Suction cup type	Diameter	Load Capacity without MTC	Load Capacity with MTC
BSP 160 R	160 mm	55,00 kg	23,50 kg
BSP 180 RL	180 mm	69,00 kg	25,00 kg
BSP 200 PK	200 mm	45,00 kg	21,50 kg
BSP 200 RL	200 mm	110,00 kg	18,50 kg
BSP 250 R	250 mm	97,00 kg	45,00 kg
BSP 280 PK	285 mm	237,00 kg	90,00 kg
BSP 290 RL	290 mm	133,00 kg	65,50 kg

Influences of MTCs on Friction

Tests show that the friction coefficient which exists when the rubber seal is in contact with the glass may be greatly reduced when using euroTECH MTC Protection Covers. As a result, a glass plate could potentially begin to slide due to the reduced friction coefficient. It is difficult to make a statement regarding exact amounts of loss of friction, as many factors can weigh in on the equation (geometry and support surface of the rubber seal, inner plane rubber support, rubber support with inner groove rubber or nap rubber support, etc.).

Safety Advices for the Use of MTCs

Note: The glass surface must also be factored when considering vacuum handling. euroTECH recommends suction testing, watching for glass plate movement or slippage which could result in serious injury, damage to machinery and/or loss of product. The sliding of a glass plate may be prevented by installing additional suction plates or larger suction plates which result in greater gripping power.

Test Summary: Benefit of MTC Protection Covers (Patent No. EP1391404)

Scope of the Tests*

Investigation of marks on the glass surface after handling with suction cups as well as potential measures to avoid or remove marks on the glass surface.

Used euroTECH Vacuum Components

Flat Suction Cup type BSP 120 RL with seals in NBR Black, NBR Grey and NBR White. Below Suction Cup type BBSC 150 R with seals in NBR Black and NBR Grey.

Test Results without Protection Covers

Identical results were produced independent of material and geometry. The marks are more intensive on the fire side than on the tin side. A special cleaning of the suction cups using Isopropyl or Flux pane cleaner prior to handling produce no visible differences. Once made, the removal of marks is only possible by cleaning the glass plate immediately with a 5% RBS solution. Afterwards cleaning with water, isopropyl or acetone could not remove the marks completely (the marks are only visible after vaporization). A later removal of the marks is only possible by polishing the entire surface with Radova or Ceroxid.



Test Results with MTC Protection Covers

Suction cups with euroTECH MTC Protection Covers did not leave any detectable marks, provided they were clean and in good condition.

Conclusion

While rubber marks from suction cup seals could only be avoided by an intensive after-treatment of the glass surface, the usage of euroTECH MTC Protection Covers did not leave any detectable marks.

*) Tests conducted at a large glass manufacturer using their own laboratory

euROTECH Vertriebs GmbH

Dammstr. 1

72351 Geislingen

GERMANY

Tel.: +49 7433 90468-0

Fax: +49 7433 90468-13

E-Mail: info@euro-tech-vacuum.de

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