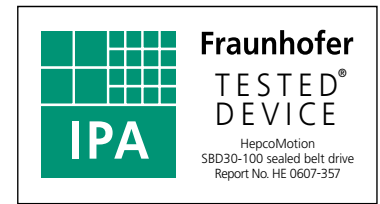


SBD Cleanroom Qualification

The cleanroom version of the **HepcoMotion** SBD product has been designed to meet an increasing demand for clean manufacturing processes and environments. A super-smooth Hepco LBG caged linear ball guide and belt drive are housed inside an anodised aluminium beam and enclosed by a stainless steel cover to provide excellent protection. The sealing arrangement is further enhanced by vacuum extraction to minimise particle emissions into the cleanroom. All external parts are in stainless steel or anodised aluminium. Optional T-slot covers prevent debris traps.



Air Cleanliness Class Attained for SBD30-100 Unit		
Velocity m/s	Vacuum Suction l/h	Air Cleanliness Class according to ISO 14644-1
0.1m	4000	3
0.25	4000	4
0.5	4000	5
1.0	4000	5
1.5	4000	6
0.25	Without vacuum suction	5

By measuring the number of airborne particles, it is possible to assess the particle emission behaviour of the cleanroom version of the Hepco SBD product and thus classify the unit based on existing air cleanliness standards according to ISO 14644-1. Independent tests have been carried out by the Fraunhofer Institute in the IPA test centre for semiconductor manufacturing equipment. The tests were performed in an ISO Class 1 cleanroom. A series of air sampling probes positioned around the SBD unit suck in air during a defined mode of operation and the air samples are analysed by a laser particle measuring device. Particle emission values were recorded at each sampling probe over a period of 100 minutes at a measuring interval of 1 minute. A statistical analysis of the values in accordance with VDI 2083 Part 8 is performed allowing the suitability of the SBD unit to be determined for use in cleanrooms by classifying it in accordance with ISO 14644-1, the results are shown in the table above.

Measurement Conditions	
Cleanroom Classification	ISO 14644-1 Class 1
Airflow	Vertical unidirectional
Airflow Velocity	0.45m/s
Room Temperature	22°C ±0.5°C
Relative Humidity	45% ±5%
Laser Particle Measuring Device	PMS - LPSA210
Air Sampling Capacity	28.3 l/min
Measurement Time	100 minutes
Measurement Interval	1 minute
Vacuum Suction	4000 l/h
SBD Stroke length	1700 mm
SBD Mounting Position	Horizontal

Details of the test conditions and parameters are shown in the table opposite. Fraunhofer have awarded the cleanroom version of the Hepco SBD product a qualification certificate to verify that the product has been tested and is suitable for use in cleanrooms corresponding to air cleanliness specifications in accordance with ISO 14644-1, the Fraunhofer qualification certificate is shown on page 2.

For optimum cleanliness performance the SBD unit should be operated with vacuum extraction of ca. 4000 l/h. This can be varied according to cleanliness requirements, however too high a suction flow rate may distort the stainless steel cover strip, preventing it from sealing correctly. Depending on the application it may be necessary to perform a running-in phase to stabilise initial particle generation. The SBD unit should be cleaned externally using isopropanol and ionizing compressed pure air or equivalent prior to installation and again after the running in phase.



Fraunhofer

TESTED[®] DEVICE

HepcoMotion
SBD30-100 sealed belt drive
Report No. HE 0607-357

DUPLIKAT

IPA Qualification Certificate

This is to certify that the product mentioned below manufactured by the company

HepcoMotion

Lower Moor Business Park
Tiverton Way, Tiverton, Devon
EX16 6TG, England

has been awarded an IPA Qualification Seal bearing the report number HE 0607-357.

The SBD30-100 sealed belt drive unit operated at the velocities and descriptions listed below is suitable for use in cleanrooms fulfilling the corresponding air cleanliness specifications in accordance with ISO 14644-1.

Velocity / Parameters	Air Cleanliness Class according to ISO 14644-1
0.1 m/s / with vacuum suction	ISO Class 3
0.5 m/s / with vacuum suction	ISO Class 5
1.0 m/s / with vacuum suction	ISO Class 5
1.5 m/s / with vacuum suction	ISO Class 6
0.25 m/s / with vacuum suction	ISO Class 4
0.25 m/s / without vacuum suction	ISO Class 5
0.25 m/s / with vacuum suction, with sealing compound Loctite 548	ISO Class 4

Detailed information and parameters of the test environment can be found in the IPA Test Report compiled by the Fraunhofer Society.

Certified on 25th September 2006.

The duration of the validity of this certificate is unlimited. For further information visit our website at <http://www.ipa-qualification.com>

Stuttgart, Germany, 25th September 2006



Signature



Fraunhofer Institut
Produktionstechnik und
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