



Fraunhofer

**TESTED[®]
DEVICE**

STRUBL GmbH & Co. KG
SABIC2201TH12 | CRP_2201_FO
Report No. ST 1411-734

DUPLICATE

Statement of
Qualification

Particle Emission

Statement of Qualification

Customer: STRUBL GmbH & Co. KG Kunststoffverpackungen
Richtweg 52
90530 Wendelstein
Germany

Component tested

Category: Materials
Subcategory: Consumables
Product name: Packaging film SABIC2201TH12|CRP_2201_FO
(manufacturing date: 12/9/2014; color: transparent;
batch number: AU232836-1)

Test result / Classification:
(in acc. with ISO 14644-1; VDI 2083-9.2)

Under the specified test conditions, the packaging film SABIC2201TH12|CRP_2201_FO is suitable at best for use in ISO Class 5 cleanrooms. This corresponds with ISO ACP_c Class 5.

Only the particle emission behavior of the packaging films has been taken into consideration. No information may be derived from the results concerning the occurrence of possible contact contamination between the packaging films and the product requiring packaging.

Random sampling of particle emissions (airborne) at representative sites

Standards/Guidelines: Based on VDI 2083-9.1, without 24-hour running-in period; VDI 2083-9.2
The norm stated refers to the version that was applicable at the time of testing.

Test devices: Optical particle counter:
• LasAir II 110 with measuring ranges $\geq 0.1 \mu\text{m}$, $\geq 0.2 \mu\text{m}$, $\geq 0.3 \mu\text{m}$, $\geq 0.5 \mu\text{m}$,
 $\geq 1.0 \mu\text{m}$ and $\geq 5.0 \mu\text{m}$

Test environment parameters:
• Cleanroom Air Cleanliness Class (according to ISO 14644-1):..... ISO 1
• Airflow velocity:..... 0.45 m/s
• Airflow pattern:..... Vertical laminar flow
• Temperature:..... $22^\circ\text{C} \pm 0.5^\circ\text{C}$
• Relative humidity:..... $45\% \pm 5\%$

Test procedure parameters: Test bench (according to ISO 9073-10):
• Position of tensioned sample: flat
Length between tensioning points l: 240 mm
• Motion cycle:
– Linear compression s: 120 mm
– Torsion: 180°
• Cycle time t: 1 s
• Duration of stress applied to test piece: 100 min
• Distance between particle counting probe and test piece: 130 mm

The measuring devices used for the qualification tests are calibrated at regular intervals; their results can be traced back to national and international standards. In cases where no national standards exist, the test procedure implemented complies with the technical regulations and norms applicable at the time of the test. The relevant documentation can be viewed on request at any time.

For further information about the test environment and parameters, please refer to the Fraunhofer IPA test report.

Fraunhofer Institute for
Manufacturing Engineering and Automation IPA

Stuttgart, February 24, 2015

Place, date of first document issued

Department of Ultraclean Technology
and Micromanufacturing

--
Place, current date

Nobelstrasse 12
70569 Stuttgart
Germany

i. A. 
Frank Bürger, Project Manager Fraunhofer IPA