

CLEAN ROOM WIPES
Introduction and positioning

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*Product Manager Wipes
Chicopee
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Chicopee Cleanroom wipe products

Chicopee VeraClean Cleanroom 74609

Chicopee VeraClean Cleanroom 74607

Chicopee VeraClean Cleanroom Sterile 74608

NOTE: *The Chicopee Cleanroom (74609 & 74607) and Chicopee Cleanroom sterile (74608) are made from EFP nonwoven grade 2603.*

Clean Room and Classifications

A clean room is a work area in which the air quality, temperature and humidity are highly regulated in order to protect sensitive equipment from contamination. Clean rooms are important features in the production of for example silicon chips, hard disk drives, and other technologies such as satellites. Medicines are usually also produced in a clean room environment.

The air in a clean room is repeatedly filtered to remove dust particles and other impurities that can damage the production of highly sensitive technologies.

The measure of the air quality of a clean room is described in Federal Standard 209. Clean rooms are rated as "Class 10.000" where there exists no more than 10.000 particles larger than 0.5 microns in any given cubic foot of air; "Class 1000" where there exists no more than 1000 particles; and "Class 100" where there exists no more than 100 particles. Hard disk drive fabrication for example requires a Class 100 clean room.

Note: 1.000 particles per cubic foot \approx 35.200 particles per cubic meter.
1 microns = 1 μ m = 1/1000 millimetre

The cleanliness classification levels are also defined by ISO standards. The following table compares Federal Standard 209 to the ISO 14644-1 classifications.

| ISO 14644-1 ISO Class | FED STD 209E | | Number of Particles per Cubic Meter by Micrometer Size | | | | | |
|--------------------------|--------------|--------|--|-------------|-------------|-------------|-----------|-----------|
| | English | Metric | 0.1 μ m | 0.2 μ m | 0.3 μ m | 0.5 μ m | 1 μ m | 5 μ m |
| ISO 1 | | | 10 | 2 | | | | |
| ISO 2 | | | 100 | 24 | 10 | 4 | | |
| ISO 3 | 1 | M1.5 | 1.000 | 237 | 102 | 35 | 8 | |
| ISO 4 | 10 | M2.5 | 10.000 | 2.370 | 1.020 | 352 | 83 | |
| ISO 5 | 100 | M3.5 | 100.000 | 23.700 | 10.200 | 3.520 | 832 | 29 |
| ISO 6 | 1.000 | M4.5 | 1.000.000 | 237.000 | 102.00 | 35.200 | 8.320 | 293 |
| ISO 7 | 10.000 | M5.5 | | | | 352.000 | 83.200 | 2.930 |
| ISO 8 | 100.000 | M6.5 | | | | 3.520.000 | 832.000 | 29.3000 |
| ISO 9 | | | | | | 35.200.000 | 8.320.000 | 293.000 |

Chicopee Clean Room Wipes

This Chicopee Cleanroom product is converted under clean room 100 conditions. This means that the work area of the converter does not exceed 100 particles of 0.5 microns per cubic foot (ISO class 5).

NOTE: *The number 100 in the product name refers to the converting conditions and does not refer to the clean room classification of the area where the products can be used. It is up to the customer and or owner of the facility to decide if the Cleanroom wipes can be used in an area with a certain clean room classification.*

The product is double packed in polybags to ensure that the risk of cross contamination is minimised, as is common practice with cleanroom equipment. All Cleanroom products are delivered with a production date and lot number on the labels.

The Cleanroom Sterile product is gamma irradiated. Irradiation using gamma (cobalt-60) radiation will kill bacteria and results in a sterile product. A gamma irradiation sticker ensures the proper dosing range. In each box of Cleanroom wipes you will find a certificate of irradiation.

Data sheets

Data sheets with product properties are available for the Cleanroom product. These data are attached to this file.

The first part of the data is identical to the data sheets of the rest of our product range. The last three tests are tested by an independent laboratory. These tests can help a customer to make a decision to use this product in an area with a certain clean room classification. The test results of the independent laboratory are available on request.

1. Extractable Ions in Deionised Water (mg/m²)

Test method: IES-RP-CC0004.2, Section 6.1.2

This test method is copyrighted and not available. The ions are extracted with deionised water and the amount of the mentioned ions are determined.

2. Non-Volatile Residue (mg/m²); Total Extractable Matter

Test method: IES-RP-CC0004.2, Section 6.1.2

"Total Burden with a Particular Solvent" calls for extracting the same wiper sample with 3 portions of deionised water (or isopropyl alcohol), each added to the wiper then boiled for five minutes, then filtered through a filter paper and combined before being heated to dryness in a pre-weighed weighing dish. Most wiper extracts are wetting agents or residual surfactants.

3. Particle Generation (particles/m²); Particles >0.5µm

Test method: IES-RP-CC0004.2 Section 5.1

"Test for Particles Under Conditions of Near-Zero Mechanical Stress" directs that clean deionised water be added to a tray large enough to hold the wiper sample in a flat position. deionised water is added to the clean tray, and the wiper is laid on top of the water and pushed under to wet with a glass rod. The tray is tipped back and forth gently several times to run the water over the top of the wiper. The water is poured into a beaker. This is repeated twice more using the same wiper, and the 3 portions of water are combined and counted for particles using a liquid particle counter. The other test done for particle counting on wipers is the biaxial shake test, which usually gives a higher particle count for the small particles than the near-zero test.

Comparison with competitor Cleanroom wipes

It is very difficult to compare Chicopee Cleanroom wipes with competitor clean room wipes. There are many tests available to test the suitability of clean room wipes for their applications. Many times it is not clear which tests competitors use. In many cases this makes comparison impossible.

Attachment: Data Sheet Cleanroom wipe

Technical Data Sheet

Chicopee® True Confidence™

| Product Description | Veraclean Cleanroom / Cleanroom Sterile |
|---------------------|---|
| Specifications | Descriptions |
| Product SKU | 74607 / 74609 / 74608 |
| Production Code | 2603 |
| Production Style | S-EFP |
| Colours | White |
| Composition | 100% Fibre |
| Fiber Content | 44% Polyester, 56% Pulp |

| Properties | Typical Value | Test Method |
|---------------------|------------------|-------------|
| Weight | 68 | TM 7027 |
| MD Strength | 28 lbs. | TM 7012 |
| CD Strength | 10 lbs. | TM 7012 |
| CD Wet Strength | 8 lbs. | TM 7012 |
| Thickness | 1,6 mm / 4 plies | TM 7015 |
| Absorption Capacity | 755% | TM 7023 |

| External Certifications | Laboratory | Test Method |
|-------------------------|------------|-------------|
| | | |
| | | |
| | | |

The specifications of the products supplied are based on the specifications mentioned in this technical data sheet and can vary within a certain scope per specified item.

Version 2, 15-02-2017

Product manufactured by PGI Nonwovens B.V. (an Avintiv Company) ISO9001 certified.

EFP grade 2603 tested on the following testing standard according to IEST RP-CC004.3.

- > - 5032 Biaxial Shake 6.1.3
- > - 5601 Fibers > 100 um 6.2.2.2
- > - 5304 NVR in IPA and DIW 7.1.2
- > - 501 Ions 7.2.2

| Code | Blend | Particles by Biaxial Shake test | Fibers by Biaxial Shake test | Non Volatile Residue, DIW | NVR, IPA | Extractable Ions | | | |
|-------------|---------------------|---|---|---------------------------|----------|-----------------------------|--------|--------|------|
| | | >0.5 micron/m2 of wipe, 10 ⁶ | 100+ micron/m2 of wipe, 10 ⁶ | % | | microgram/ gram of wiper | | | |
| | | IEST-RP-CC004.3, Sect 6.1.3 | IEST-RP-CC004.3, Sect 6.2.2.2 | CC004.3, Sect 7.1.2 | | IEST-RP-CC004.3, Sect 7.2.2 | | | |
| | | | | | | Na+ | Mg++ | K+ | Ca++ |
| A94Z1 | 55 cellulose/45 pet | 280 | 0,879 | | | 51,3 | <1 bdl | <2 bdl | 5,29 |
| P002 / 2603 | 56 cellulose/44 pet | 154 | 0,227 | 0,056 | 0,03 | 58,2 | 1,75 | 6,19 | 7,78 |