

PUREZERO*

HG5 Nitrile Cleanroom Gloves



MANAGE YOUR CLEANROOM RISKS WITH HALYARD* **PUREZERO*** HG5 NITRILE GLOVES



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Because you're responsible for managing risks in your cleanroom operation, choosing the right cleanroom glove is critical.

Your gloves have a big job to do, protecting your workers as well as your product and your process. Plus you need a reliable supply to avoid operations disruption. That's why we created HALYARD* **PUREZERO*** Cleanroom Gloves.

PUREZERO* Cleanroom Gloves are ideal for applications that involve handling delicate equipment in microelectronics, semiconductors, optics, pharmaceutical and medical device manufacturing applications. In fact, they are specifically designed to meet the stringent requirements of cleanroom environments.

PUREZERO* Gloves are designed to exact standards, to help you:

- manage the risks associated with user comfort and protection
- manage product contamination
- manage supply chain resiliency



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THE RISK: USER COMFORT AND PROTECTION

The accelerator-free¹ formulation of PUREZERO* Cleanroom Nitrile Gloves is the solution. It reduces the risk of allergies and skin irritation associated with accelerator chemicals in other nitrile gloves. As a result, PUREZERO* Gloves are comfortable to wear, allowing workers to focus on their delicate tasks rather than their gloves.

PUREZERO* Cleanroom Nitrile Gloves are designed to protect workers with effective barrier protection against chemical splash, micro-organisms and viruses.

Our gloves are PPE Category III certified according to the following standards:

EN ISO 374-1:2016+A1:2018/Type B Resistance to Chemical Permeation

EN ISO 374-5:2016 Micro-organism and Virus Protection

EN ISO 374-5:2016/ Protection against Micro-organism Risk

EN ISO 374-2:2019/ Resistance to Penetration

EN ISO 374-4:2019/ Resistance to Degradation

EN ISO 21420:2020/ General Requirement for Gloves

THE RISK: PRODUCT CONTAMINATION

The solution is the consistent quality of PUREZERO* HG5 Cleanroom Gloves, ensuring low particle levels. HALYARD* PUREZERO* Gloves are manufactured and packaged at our ISO 9001 facility in state-of-the-art cleanrooms and are recommended for ISO Class 5 or higher and Grade C/D cleanrooms. Our gloves are clean processed (washed repeatedly in deionized water) to ensure consistent control of low particles.

- Low Particle Levels (max >0.5 µm) <1500 particles/cm² for white gloves, (max >0.5 µm) <2000 particles/cm² for blue gloves
- AQL of 1.0 for pinholes
- Static dissipative in use²
- Double bagged plus case liner



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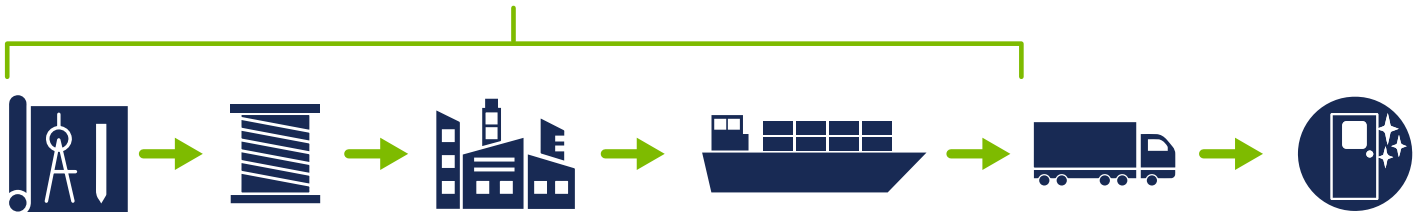
Manufactured at OUR OWN
Safeskin Facility in Thailand.

THE RISK: SUPPLY CHAIN RESILIENCY

PUREZERO* Cleanroom Gloves are the solution, ensuring reliable supply, regulatory compliance and consistent quality.

HALYARD* has manufactured private label cleanroom gloves for more than 20 years at our Safeskin Medical & Scientific (Thailand) Ltd. manufacturing facility, which holds ISO 9001, ISO 14001 and ISO 13845 certifications.

We control the materials and design while adhering to strict quality standards and product specifications in our own facilities, with our own teammates. Quality levels are guaranteed, with all raw materials and components traceable to their original supplier. And with our global product codes, you can use **one code/SKU from HALYARD* globally at all of your production facilities.**



From raw materials to distribution, we have full control over our global supply chain.

RISK-FREE CONVERSION

With our years of cleanroom glove experience, HALYARD* can provide all the support you need to easily convert from your current glove to **PUREZERO*** Cleanroom Gloves, including:

- **Technical documentation**
- **Validation data**
- **Product knowledge and expertise**

We also have the manufacturing capacity to assure you a reliable glove supply going forward.

To trial HALYARD* **PUREZERO*** Cleanroom Gloves, contact your Thomas Scientific Sales Representative today.



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PUREZERO* HG5 CLEANROOM GLOVE PORTFOLIO

The HG5 family of HALYARD* PUREZERO* offers two accelerator-free¹ non-sterile gloves to address the needs of pharmaceutical, medical device, microelectronics and semi-conductor manufacturing industries.

NON-STERILE

HALYARD* PUREZERO* HG5 WHITE NITRILE GLOVES

PUREZERO* HG5 White Nitrile Cleanroom Gloves are non-sterile, ambidextrous, and 12 inches long with a high tack/grip surface and feature a beaded cuff to aid in donning and help prevent roll down.



Physical Properties

| | |
|--|-----------------|
| AQL | 1.0 |
| Non-Sterile | ✓ |
| Ambidextrous | ✓ |
| Tacky Grip | ✓ |
| Textured Fingertips | ✓ |
| Accelerator-Free ¹ | ✓ |
| Static Dissipative in Use ² | ✓ |
| Latex-Free | ✓ |
| Powder-Free | ✓ |
| Silicone-Free | ✓ |
| Tensile Strength ³ | 24 MPa (Target) |
| Ultimate Elongation ³ | 600% |
| Shelf Life | 3 Years |

Cleanliness Properties

Max Particle Count (>0.5 µm) <1,500 particles/cm² IEST RP-CC005

For use in ISO Class 5 or higher, Grade C/D

TACKY GRIP
TEXTURED FINGERTIPS

Ordering Information

| Size | Thomas No. | Code |
|------|------------|------------|
| XS | 23A00C903 | CLN30512XS |
| SM | 23A00C904 | CLN30512SM |
| MD | 23A00C905 | CLN30512MD |
| LG | 23A00C906 | CLN30512LG |
| XL | 23A00C907 | CLN30512XL |

HALYARD* PUREZERO* HG5 BLUE SGX* NITRILE GLOVES

PUREZERO* HG5 Blue SGX* Nitrile Cleanroom Gloves with SMOOTH GRIP TECHNOLOGY* are non-sterile, ambidextrous, and 12 inches long, double donnable and feature a beaded cuff to aid in donning and help prevent roll down.



Physical Properties

| | |
|--|-----------------|
| AQL | 1.0 |
| Non-Sterile | ✓ |
| Ambidextrous | ✓ |
| Smooth Grip | ✓ |
| Textured Fingertips | ✓ |
| Accelerator-Free ¹ | ✓ |
| Static Dissipative in Use ² | ✓ |
| Latex-Free | ✓ |
| Powder-Free | ✓ |
| Silicone-Free | ✓ |
| Tensile Strength ³ | 24 MPa (Target) |
| Ultimate Elongation ³ | 600% |
| Shelf Life | 3 Years |

Cleanliness Properties

Max Particle Count (>0.5 µm) <2,000 particles/cm² IEST RP-CC005

For use in ISO Class 5 or higher, Grade C/D

SMOOTH GRIP
TEXTURED FINGERTIPS

Ordering Information

| Size | Thomas No. | Code |
|------|------------|------------|
| XS | 23A00C908 | CLN92512XS |
| SM | 23A00C909 | CLN92512SM |
| MD | 23A00C910 | CLN92512MD |
| LG | 23A00C911 | CLN92512LG |
| XL | 23A00C912 | CLN92512XL |

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ADDED PROTECTION FROM THE RISK OF CHEMICAL EXPOSURE

It's critical to protect staff from exposure to potentially hazardous chemicals and chemotherapy drugs. In addition to providing a barrier to chemical splash, microorganisms and viruses, **PUREZERO*** HG5 Cleanroom Gloves are **now tested against 2 chemotherapy drugs and 21 chemicals**.

CHEMOTHERAPY DRUG RESISTANCE GUIDE⁴

| Chemotherapy Agent (Concentration in mg/ml) | PUREZERO* HG5 White Nitrile Gloves 12" | | PUREZERO* HG5 Blue SGX* Nitrile Gloves 12" | |
|--|---|---|---|---|
| | Minimum Breakthrough Time (minutes) | Permeation Rate ($\mu\text{g}/\text{cm}^2/\text{min}$) | Minimum Breakthrough Time (minutes) | Permeation Rate ($\mu\text{g}/\text{cm}^2/\text{min}$) |
| Carmustine (BCNU) (3.3) | 119 | 0.1 | 117.7 | 0.05 |
| Thiotepa (1.0) | 69.4 | 0.02 | 46.7 | 0.02 |

Use the rating system below to determine the chemotherapy compatibility for exposure:

| | |
|----------|--|
| <10 | Not recommended for use - breakthrough can occur in less than 10 minutes. |
| 11 - 239 | Use with caution - breakthrough can occur between 11 and 239 minutes. |
| >240 | Recommended for protection - no breakthrough up to 240 minutes. |
| N/A | The chemotherapy drug did not reach the minimum permeation rate (0.01 $\mu\text{g}/\text{cm}^2/\text{min}$) as defined within ASTM D6978. |

CAUTION: It's the user's responsibility to determine the applicability of these gloves for their intended use with chemotherapy drugs.

*Tested per ASTM D6978, Standard Practice Assessment of Resistance of Medical Gloves to Permeation by Chemotherapy Drugs. The testing conditions used are intended to approximate the worst case conditions for use. Testing was conducted on a single layer glove material.

DEFINITION OF TERMS

Breakthrough time: The time required for the test chemical to be detected on the inside of the glove. Essentially, this is the amount of time that the glove can resist a chemical when the glove is fully immersed in the chemical.

Permeation: The process where chemicals, such as liquids, gases and vapors can pass through a glove film (or other PPE interfaces) without penetrating directly through a pinhole, tear or other visible opening.

Permeation rate: The flowrate of the chemical after the chemical breaks through the inside of the glove. It is measured in amount per surface area of the glove per time ($\mu\text{g}/\text{cm}^2/\text{min}$).

Contact your Sales Representative for additional chemical and chemotherapy drug testing information.

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CHEMICAL RESISTANCE GUIDE⁵

| Chemical (Concentration %) | PUREZERO* HG5 White Nitrile Gloves 12" | | PUREZERO* HG5 Blue SGX* Nitrile Gloves 12" | |
|-----------------------------|---|---|---|---|
| | Minimum Breakthrough Time (minutes) | Permeation Rate ($\mu\text{g}/\text{cm}^2/\text{min}$) | Minimum Breakthrough Time (minutes) | Permeation Rate ($\mu\text{g}/\text{cm}^2/\text{min}$) |
| Acetic Acid (99) | 15 | 2.9E+03 | 10.1 | 3.2E+04 |
| Acrylamide (40) | >480*** | 0.03 | >480*** | <1.0 |
| Ammonium Hydroxide (25) | 60.8 | 5.5 | 26.4 | 4.2 |
| 1-Butanol (99) | 55.8 | 1.7E+01 | 357.6 | 0.9 |
| Chloroform (70) | 0 | N/A | 0 | N/A |
| Citric Acid (30) | >480 | <1.0 | >480 | <1.0 |
| Citric Acid (70) | >480 | <1.0 | >480 | <1.0 |
| Cyclohexane (99) | 60.6 | 2.9E+01 | >480*** | <1.0 |
| Dimethyl Sulfoxide (99) | 10.2 | N/A | 0 | N/A |
| Ethanol (70) | 43.3 | 11.4 | 29.1 | 2.0E+01 |
| Ethanol (99) | 20.3 | 7.6E+01 | 17.5 | 7.0E+01 |
| Ethidium Bromide (1) | >480 | <1.0 | >480 | <1.0 |
| Hydrochloric Acid (30) | 341.1 | 17.0 | >480 | <1.0 |
| Isopropyl Alcohol (70) | 145.2 | 3.0 | >480*** | <1.0 |
| Isopropyl Alcohol (99) | 98.5 | 3.3 | >480*** | <1.0 |
| Methanol (99) | 9.3 | N/A | 1.2 | 4.8E+01 |
| Nitric Acid (65) | 10.0 | 3.2E+02 | 3.1 | 3.2E+04 |
| Phosphoric Acid (70) | >480 | <1.0 | >480 | <1.0 |
| Sodium Hydroxide (50) | >480 | <1.0 | >480 | <1.0 |
| Sodium Hypochlorite (10-13) | >480 | <1.0 | >480 | <1.0 |
| Sulfuric Acid (50) | >480 | <1.0 | >480 | <1.0 |

Use the rating system below to determine the chemical compatibility for exposure:

| | |
|----------|---|
| <10 | Permeation breakthrough is poor - avoid use with this chemical. |
| 11 - 479 | Glove is suitable under careful control of its use. |
| >480 | Permeation breakthrough is excellent. |

The following gloves are applicable to this chart:

HALYARD* PUREZERO* HG5 White Nitrile Gloves

HALYARD* PUREZERO* HG5 Blue SGX* Nitrile Gloves

*** Though detected at trace amounts, the permeation did not hit the required rate of $1.0 \mu\text{g}/\text{cm}^2/\text{min}$ to be deemed as Standardized Breakthrough per EN 16523-01:2015.

DISCLAIMER: The permeation breakthrough times presented in this chart were evaluated using the Test Method EN 16523-1.

* Permeation Time (minutes) and Permeation Rate ($\mu\text{g}/\text{cm}^2/\text{min}$) using Test Method EN 16523-1

Contact your Sales Representative for additional chemical and chemotherapy drug testing information.

HG5 GLOVE SELECTION GUIDE

| | Description | Designed for | Max Particle Count | ISO Class | Finish | Fingertips | Double Donning | Size Range | Fingertip Thickness | Case Count |
|-------------|---|---|--------------------|--|-------------|---------------------|-----------------------------|------------|---------------------|-------------------------|
| NON-STERILE | HALYARD* PUREZERO* HG5 White Nitrile Gloves 12" | Semiconductor, Pharmaceutical, Medical Device Manufacturing | <1500 | ISO Class 5 or higher and Grade C/D cleanrooms | Tacky Grip | Textured Fingertips | Recommended for Outer Glove | XS-XL | 0.15mm (5.9 mil) | 1000/cs Ambidextrous |
| | HALYARD* PUREZERO* HG5 Blue SGX* Nitrile Gloves 12" | Semiconductor, Pharmaceutical, Medical Device Manufacturing | <2000 | ISO Class 5 or higher and Grade C/D cleanrooms | Smooth Grip | Textured Fingertips | Outer or Under | XS-XL | 0.10mm (4 mil) | 1500/cs Ambidextrous |

| | | | | | | |
|--------------------------------------|---|---------|---------------------------|-------------------------|-----------------------------|--|
| Applies to all PUREZERO* HG5 Gloves: | Accelerator-Free ¹ Static Dissipative in Use ² Compliant with the REACH regulation | AQL 1.0 | CE 2797 (PPE Cat. III) | ISO 374-5:2016 VIRUS | EN ISO 374-1:2016 Type B | |
|--------------------------------------|---|---------|---------------------------|-------------------------|-----------------------------|--|

1 Not formulated with these commonly used vulcanizing chemicals: Sulfur, Thiurams, Thioxoles, Guanidines and Carbamates. 2 Tested against ANSI SP 15.1
 3 Tested per ASTM D6319, EN 455-2
 4 Tested per ASTM D6978, Standard Practice Assessment of Resistance of Medical Gloves to Permeation by Chemotherapy Drugs. The testing conditions used are intended to approximate the worst case conditions for use. Testing was conducted on a single layer glove material.
 5 Gloves tested for chemical resistance per EN 16523-1. This European Standard specifies a test method for the determination of the resistance of protective clothing, gloves and footwear materials to permeation by potential hazardous liquid chemicals under the condition of continuous contact. The testing conditions used are intended to approximate the worst case conditions for use. Testing was conducted on a single layer glove material.



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