
How to Assess Applications for Cut-Resistant Hand Protection (Updated for ANSI/ISEA 105:2024)

Assessing applications for the proper protection—whether it’s hand, eye, or respiratory protection—is essential to worker safety. The only reliable way to assess hand protection needs is through direct observation during the operation. Watching workers in action provides the clearest understanding of the true risks and hazards involved, which leads to more accurate and effective recommendations.

Understanding the Hazards

Cut Hazard

This remains the first and foremost consideration for cut-resistant gloves. The ANSI/ISEA 105:2024 standard continues to use grams of weight (measured by the ASTM F2992-15 TDM test method) to determine cut performance, but it now clarifies performance levels and testing uniformity.

To evaluate properly, identify what’s causing the cut hazard—what is being handled, how heavy or large it is, and the handling method. A thin, flexible glove rated ANSI A4 may suffice for sheet metal assembly, while glass handling or stamping operations may demand A7–A9 levels.

Abrasion Hazard

Often underestimated, abrasion can degrade cut-resistant materials over time. The 2024 revision reinforces that abrasion resistance (tested under ASTM D3389 or ISO 12947-1) should be assessed independently of cut level, since surface wear can reduce cut protection. Matching abrasion resistance to the work environment ensures long-term glove integrity—especially for HPPE or aramid yarn blends that might otherwise wear down quickly in high-friction use.

Heat Hazard

Heat is distinct from open flame. Many high-performance fibers, such as aramids, retain strength and structure under high temperatures, while HPPE can lose mechanical performance at relatively low heat exposure. The 2024 standard reaffirms using ASTM F1060 (contact heat) data for gloves exposed to elevated temperatures. Always verify temperature thresholds in real working conditions, not just lab values.

Flame and Spark Hazard

HPPE, nylon, and polyester should be avoided around sparks or open flames due to their low melting points. Instead, gloves made with para- or meta-aramids or pre-oxidized cotton perform best in these settings. ANSI/ISEA 105:2024 continues to reference ASTM F1358 and NFPA standards for evaluating ignition and flame resistance where applicable.

Cold and Freezing Hazard

Requests for ultra-thin, dexterous gloves that also provide cold protection are common but technically contradictory. Effective insulation requires air-trapping materials that slow heat loss—typically at the expense of dexterity. Layered systems with materials like Thinsulate™, brushed acrylic, or insulated liners with waterproof membranes provide the best compromise. Keeping the back of the hand warm—where major blood vessels run—is critical for finger warmth and dexterity.

Puncture Hazard

Puncture protection often gets overlooked. The 2024 ANSI/ISEA 105 standard still measures puncture resistance using ASTM F1342 but clarifies that **needlestick resistance** (ASTM F2878) should be used for fine hazards like needles or narrow burrs. Assess both standard puncture and hypodermic-style risks separately, since materials that resist one type may not perform well against the other.

Beyond Hazards: Operational Considerations

Dexterity

Dexterity impacts productivity and ergonomic safety. The ANSI 105:2024 update acknowledges that high cut resistance can sometimes compromise dexterity, so performance should be balanced to match the operation. Polyurethane coatings remain excellent for fine work; nitrile offers a good blend of dexterity and oil resistance; foam latex provides flexibility but should never be used around oils.

Grip

Grip is both a safety and performance factor. Poor grip can cause dropped parts, leading to secondary injuries. Match the coating to the work environment:

- **Light oil:** PU or foam nitrile
 - **Medium oil:** Foam or sandy nitrile
 - **Heavy oil:** Double-dipped sandy nitrile or PVC
- Latex performs well in dry or aqueous conditions but breaks down in oily environments.

Oil and Liquids

Use Safety Data Sheets (SDS) to understand chemical compositions of oils or lubricants. Choose coatings that resist chemical permeation as defined under ASTM F739 or EN 374. For aqueous exposure, latex or nitrile are effective, but PU coatings are less suitable for wet grip or barrier protection.

Water and Wet Environments

Water exposure can create cold stress or microbial risks. Gloves with waterproof membranes or double-dip coatings are essential. Latex provides excellent wet grip, but nitrile is better when both water and oil exposure exist.

The Assessment Process

The most effective assessments combine **visual observation** with data review (including SDS and environmental conditions). Only through an on-site evaluation can a qualified safety or EHS professional identify every risk factor and operational nuance. Too often, glove selection addresses one hazard while missing others—resulting in incomplete protection.

A comprehensive walkthrough, ideally with a glove specialist, should document:

- All hazards (cut, puncture, abrasion, temperature, and chemical)
- Handling methods
- Environmental conditions
- Worker feedback on comfort and dexterity

Combining these insights with ANSI/ISEA 105:2024 performance levels ensures that hand protection recommendations are accurate, compliant, and practical.

Conclusion

Selecting the right glove is never a guessing game—it's a structured process rooted in hazard observation, testing standards, and real-world performance. The updated ANSI/ISEA 105:2024 standard strengthens consistency in classification and testing, helping safety professionals make better, evidence-based choices.

Understanding the hazards, materials, and coatings—and observing how they perform in the field—remains the foundation for effective hand protection and safer, more productive operations.
