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THE HAND PROTECTION **SPECIALISTS**

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TG/UK_UPDATE/10/23

CERTIFIED ZERO CARBON COMPANY
sustainablefuturegroup.com

BSiF Registered Safety Supplier®

YOUR CARBON NEUTRAL
HAND PROTECTION
PARTNER

CERTIFIED CARBON NEUTRAL

A GUIDE TO GLOVE STANDARDS

Traffi®

THE HAND PROTECTION **SPECIALISTS**

UNDERSTANDING GLOVE MARKINGS

CE Mark

The CE Mark assures compliance with European legislation.

Information Pictogram

The information pictogram indicates the availability of the user information, which consists of:

- The supplier
- Glove designation
- Sizing
- Applicable glove standards and ratings
- Limitations
- Listing of any known allergy
- Care and cleaning instructions
- Shelf life if under 12 months from manufacture
- Relevant accessories
- Special transport packaging if required

INTRODUCING EN ISO 21420

EN 21420 has been introduced as a replacement for EN420 and ensures the materials manufacturers of PPE use in their products do not adversely affect the health or safety of the user. It also responds to the growing trend in standardisation to address the topic of 'innocuousness' and take into consideration the requirements of the EU PPE Regulation as ISO 21420, helping to address the Essential Health & Safety aspects of Annex II. It also provides further alignment with the Registration, Evaluation, Authorisation and Restriction of Chemicals, legislation on hazardous substances or substances of very high concern.

Key Changes Manufacturers Need To Be Aware Of

- Introduction of a new pictogram for electrostatic properties EN 16350
- Removal of the protein content test in natural rubber gloves
- Introduction of date of manufacture markings
- Removal of minimal glove length requirements, unless required by a specific standard i.e. welding gloves
- Other subtle changes concerning information for users, additional information on donning/doffing, product integrity checks before use

Key Requirements

- Chromium VI content in leather should be no more than 3mg/kg (Test method EN 17075)
- Any metallic materials that could come into contact with the skin shall not release nickel in more than 0.5µg/cm2 per week (Test method EN 1811).
- Azo colorants which release carcinogenic amines shall not be detectable (Test method ISO 17234-1 leather or ISO 14362-1 textile).
- pH value shall be between 3.5-9.5 (Test method ISO 4045 leather or ISO 3071 textile).
- DMFa (dimethylformamide) shall not exceed 0.1% weight/weight (Test method prEN 16778).
- The levels of performance should be based on the lowest results obtained before and after cleaning cycles (consideration of care instructions for testing).
- For gloves worn in ATEX environments, the electrostatic properties shall be tested (Test method EN 16350).

Important Glove Marking Changes

Each protective glove shall be marked with:

- Manufacturer's name and postal address
- Glove designation
- Size designation
- Date of manufacturing (month and year)

UNDERSTANDING EN 388:2016+A1:2018

Standard For Gloves Protecting Against Mechanical Risks

EN 388:2016 is a widely-recognised standard which safety gloves are commonly tested against across a huge range of industries. Any glove in the market which is categorised as cut-resistant should be marked to this standard. The EN 388:2016 standard uses index values to rate the performance level of a glove in protecting the user against mechanical risks.

- **Abrasion** (1-4) (Updated for 2016)
- **Coupe Blade Cut Test** (1-5)
- **Tear** (1-4)
- **Puncture** (1-4)
- **EN ISO 13997** (A-F) (New for 2016)
- **Impact** (New for 2016)

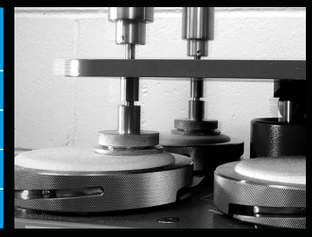
EN 388:2016

4 X 4 3 D

ABRASION RESISTANCE | CUT RESISTANCE | TEAR RESISTANCE | PUNCTURE RESISTANCE | EN ISO CUT RESISTANCE

ABRASION TEST

ABRASION RESISTANCE (CYCLES)	PERFORMANCE LEVEL RATING
100	1
500	2
2000	3
8000	4



UPDATED: ABRASION PAPER

This test is carried out through the Martindale Abrasion Machine. A sample material is cut from the palm of the glove and fitted to a rubbing head of fixed size and weight. This is moved in an elliptical motion over a table covered with abrasion paper. The performance level of the glove is measured by the number of abrasion cycles required to 'hole' the material. Four samples are tested in this way, with the overall performance level decided by the lowest result.

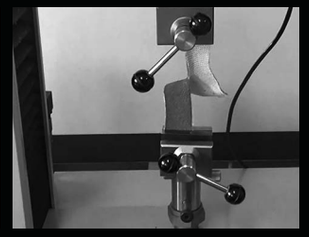
EN 388:2016

4 1 3 1 A

ABRASION RESISTANCE | CUT RESISTANCE | TEAR RESISTANCE | PUNCTURE RESISTANCE | EN ISO CUT RESISTANCE

TEAR TEST

TEAR RESISTANCE (NEWTONS)	PERFORMANCE LEVEL RATING
10	1
25	2
50	3
70	4



TEAR RESISTANCE

In this test, four samples from the palm of the glove are clamped in a standard tensile strength testing machine. The jaws move apart at a speed of 100mm per minute and from this the force required to tear the sample is measured. Performance levels range from 1 (resistance of peak force between 10N and 25N) to 4 (tear strength is at least 70N). For single materials, the level is decided by the lowest result of the four tests. For multiple, unbonded layers, each layer must be tested individually and the level is based on the lowest individual result of the most tear resistant material.

EN 388:2016

4 X 4 3 D

ABRASION RESISTANCE | CUT RESISTANCE | TEAR RESISTANCE | PUNCTURE RESISTANCE | EN ISO CUT RESISTANCE

COUPE TEST

CUT INDEX	PERFORMANCE LEVEL RATING
1.2	1
2.5	2
5	3
10	4
20	5

COUPE TEST

Up until now, the 'Coupe Blade Cut Test' has been the standard test method for cut protection. A rotating circular blade moves horizontally to-and-fro across a fabric sample with a fixed force of 5 Newton's (N) applied from above. The test ends when the blade breaks through the sample material and the result is specified as an index value. This result is determined by the cycle count needed to cut through the sample and additionally by calculating the degree of wear and tear on the blade. This represents an exposure type cut risk in the workplace.

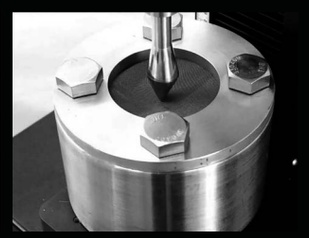
EN 388:2016

4 1 3 1 A

ABRASION RESISTANCE | CUT RESISTANCE | TEAR RESISTANCE | PUNCTURE RESISTANCE | EN ISO CUT RESISTANCE

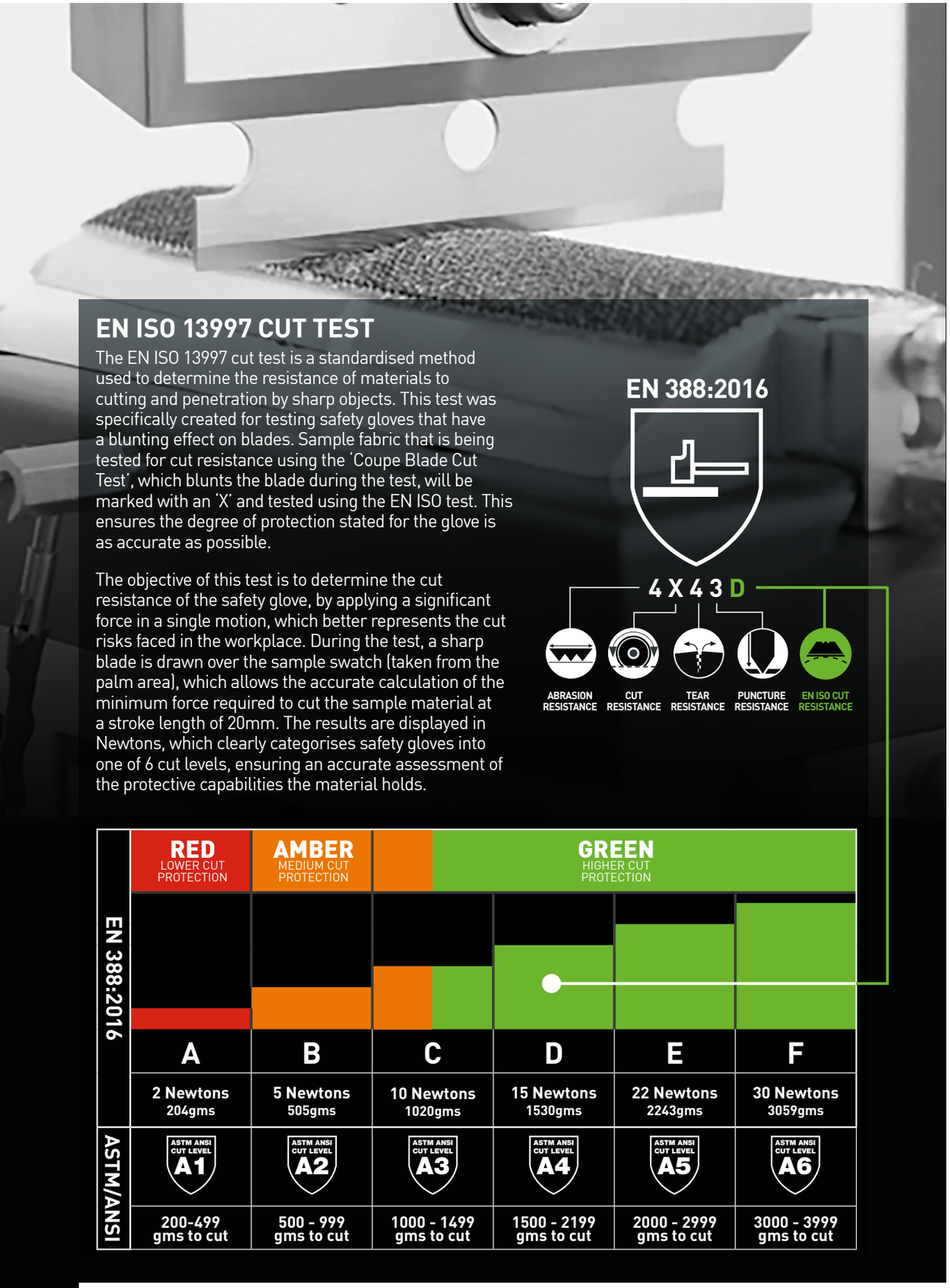
PUNCTURE TEST

PUNCTURE RESISTANCE (NEWTONS)	PERFORMANCE LEVEL RATING
20	1
60	2
100	3
150	4



PUNCTURE RESISTANCE

This test consists of a compression test machine which pushes a rounded stylus 50mm (the size of a standard roofing nail) into the sample cut from the palm of the glove at a speed of 100mm per minute. From this, the maximum resistance force is recorded. Performance levels range from 1 (puncture resistance force of between 20N and 60N) to 4 (measured resistance of at least 150N). These levels are decided by the lowest of four test results.



EN ISO 13997 CUT TEST

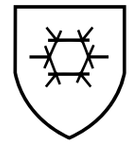
The EN ISO 13997 cut test is a standardised method used to determine the resistance of materials to cutting and penetration by sharp objects. This test was specifically created for testing safety gloves that have a blunting effect on blades. Sample fabric that is being tested for cut resistance using the 'Coupe Blade Cut Test', which blunts the blade during the test, will be marked with an 'X' and tested using the EN ISO test. This ensures the degree of protection stated for the glove is as accurate as possible.

The objective of this test is to determine the cut resistance of the safety glove, by applying a significant force in a single motion, which better represents the cut risks faced in the workplace. During the test, a sharp blade is drawn over the sample swatch (taken from the palm area), which allows the accurate calculation of the minimum force required to cut the sample material at a stroke length of 20mm. The results are displayed in Newtons, which clearly categorises safety gloves into one of 6 cut levels, ensuring an accurate assessment of the protective capabilities the material holds.

	RED LOWER CUT PROTECTION	AMBER MEDIUM CUT PROTECTION	GREEN HIGHER CUT PROTECTION			
EN 388:2016	A	B	C	D	E	F
	2 Newtons 204gms	5 Newtons 505gms	10 Newtons 1020gms	15 Newtons 1530gms	22 Newtons 2243gms	30 Newtons 3059gms
ASTM/ANSI	ASTM ANSI CUT LEVEL A1	ASTM ANSI CUT LEVEL A2	ASTM ANSI CUT LEVEL A3	ASTM ANSI CUT LEVEL A4	ASTM ANSI CUT LEVEL A5	ASTM ANSI CUT LEVEL A6
	200-499 gms to cut	500 - 999 gms to cut	1000 - 1499 gms to cut	1500 - 2199 gms to cut	2000 - 2999 gms to cut	3000 - 3999 gms to cut

EN 511:2006 PROTECTING AGAINST COLD

EN 511:2006



Digit: A B C
Result: 4 3 1

The EN 511 symbol displays how much protection a glove will provide against cold risks. Alongside the symbol, there will be three numbers:

Digit	Test	Marking on glove
A	Resistance to convective cold (0-4)	4
B	Resistance to contact cold (0-4)	3
C	Water penetration after 30 minutes (1 = pass, 0 = fail)	1

EN 407:2020 PROTECTING AGAINST THERMAL RISKS

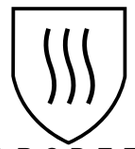
EN 407:2020

Digit: A B C D E F
Result: 4 2 3 2 2 X

The EN 407 standard measures a glove's thermal resistance against six different tests. The results are shown on the pictogram on a scale of 1 (lowest) to 4 (highest), in the following order:

EN 407, like other PPE glove standards, requires the glove to be marked with a symbol (pictogram) showing the performance levels of the standard that have been met. The 2020 version of the standard introduced a second pictogram to replace the pictogram used within the previous version of the standard under certain conditions.

EN 407:2020



Digit: A B C D E F
Result: X 1 X X X X

The previously-used pictogram (top right) which incorporates a 'flame' icon is now used to label a product that is claimed to limited flame spread level to at least a Level 1 performance. The manufacturer may also claim other properties at the achieved levels. The new pictogram (right right) is now used to label a product that is not claimed to limit flame spread. The manufacturer must claim at least one other property up to Level 2, and the marking of a product with both pictograms is forbidden.

Digit	Test	Results measured in:	Results			
			1	2	3	4
A	After-burn time	Seconds	≤ 15	≤ 10	≤ 3	≤ 2
A	After-glow time	Seconds	infinity	≤ 120	≤ 25	≤ 5
B	Contact heat	Temp in °C after 15sec	100°	250°	350°	500°
C	Convective heat	Seconds	≥ 4	≥ 7	≥ 10	≥ 18
D	Radiant heat	Seconds	≥ 7	≥ 20	≥ 50	≥ 95
E	Small splashes of molten metal	Number of drops	≥ 10	≥ 15	≥ 25	≥ 35
F	Large quantities of molten metal	Gram	30	60	120	200

EN ISO 374:2016
PROTECTING AGAINST CHEMICALS

IS EN 374:2003 DIFFERENT TO EN ISO 374:2016?

The EN 374 series of standards is a set of European norms that pertain to protective gloves intended for use in environments where chemicals and microorganisms are present. These standards provide a framework for evaluating the resistance and effectiveness of gloves against various types of chemicals and hazards, ensuring that the gloves provide adequate protection to the wearer. The standards are relevant for industries such as healthcare, chemical processing, laboratory work, and more.

EN ISO 374-1

The EN 374 standards consist of several parts, each addressing different aspects of glove performance and protection:

EN ISO 374-1:
Protective Gloves Against Chemicals and Micro-Organisms

Most chemical resistant gloves will be tested to EN 374 - 1. EN 374 - 1 will test your gloves to a total of 18 different chemicals before awarding them with a certification of either A, B or C depending on how resistant the glove is to chemicals. Finally, this standard also includes a logo that quickly informs the user of which chemicals the glove can be used with.

Firstly, the gloves will feature a logo on their back that includes the Type and the chemicals that you can use the glove with. The letters correlate to a chemical that can be identified in the table below the logo. Finally, the type corresponds to the information in the chemical table opposite.

Gloves are now separated into 3 classification types based on permeation performance -

TYPE A, TYPE B or TYPE C.

The table below lists the performance level and number of chemicals required for each classification type:

Chemical	Code Letter
Methanol	A
Acetone	B
Acetonitrile	C
Dichloromethane	D
Carbon Disulphide	E
Toluene	F
Diethylamine	G
Tetrahydrofuran	H
Ethyl Acetate	I
n-Heptane	J
Sodium Hydroxide 40%	K
Sulphuric Acid 96%	L
Nitric Acid 65%	M
Acetic Acid 99%	N
Ammonoim Hydroxide 25%	O
Hydrogen Peroxide 30%	P
Hydroflouric Acid 60%	S
Formaldehyde	T

Type A:
Protective glove with permeation resistance of at least 30 minutes with at least six test chemicals

Type B:
Protective glove with permeation resistance of at least 30 minutes with at least three test chemicals

Type C:
Protective glove with permeation resistance of at least 10 minutes with at least one test chemical

EN ISO 374-1/Type A

EN ISO 374-1/Type B

EN ISO 374-1/Type C

EN 374-2

EN 374-2: 2014
Determination of Resistance to Penetration by Liquids

This part focuses on the glove's ability to prevent the penetration of liquids. The test involves filling the glove with a liquid and observing if any leaks occur over a specified time period.

EN 374-3:
Determination of Resistance to Permeation by Chemicals (Permeation Test), now substituted by EN 16523-1:2015

EN 374-4:
Determination of Resistance to Degradation by Chemicals

This standard evaluates the glove's resistance to physical changes (such as deterioration, swelling, or shrinkage) when exposed to specific chemicals.

EN 374-5: Terminology and Performance Requirements for Micro-Organism Risks

EN 374-5 addresses gloves designed to protect against microorganisms. It defines terminology related to microbiological hazards and outlines testing procedures for evaluating the glove's resistance to microorganisms.

EN ISO 374-5:2016
Terminology and performance requirements for micro-organisms risks

Part 5 specifies performance requirements for gloves that protect the user against micro-organisms, it's been taken out of the old Part 2 and developed.

Now two classifications:

a. Protection against bacteria and fungi

b. Protection against viruses, bacteria and fungi

EN ISO 374-5

Symbol Designating Gloves with Fungi and Bacteria Resistance

EN ISO 374-5

Symbol Designating Gloves with Fungi, Bacteria and Viral Risks

UNDERSTANDING COATINGS

By using new and proven technologies, Traffi is at the forefront of product innovation, ensuring we offer our customers the best possible protection at the best value.

MICRODEX

Technically engineered, highly dexterous microfoam coating combined with state-of-the-art fine gauge high performance yarn technology. Provides premium comfort, dexterity and tactility.

MicroDex Nitrile:

- Impressively fine palm dip coating which offers excellent protection against abrasion, punctures, cuts and snags.
- Whilst not flame-resistant*, it performs well in a range of temperatures between -4°C and 149°C.
- Great coating to provide protection against chemicals, oils, greases, & fats.
- Delivers high comfort levels and can be used in a wide range of environments.

X-DURA

Dependable and reliable coating and liner technology you can count on, built on our years of expertise in the glove world.

X-Dura Nitrile

- Foamed nitrile gives the coating a sponge-like property, great for when in contact with smooth, oily surfaces. In effect, any surface oil is soaked up and displaced, meaning grip can be significantly improved.
- Flat nitrile coatings provide a high level of oil and water resistance. Additionally, they offer good grip in dry conditions and solid durability with minimal micron thickness. Also can be combined as a knuckle or wrist dip first coat under a foam palm coating to provide a highly durable oil and water resistant double dip coating.

X-DURA PU

- Seen as the ideal choice of coating for cut-resistant gloves in dry conditions.
- Typically soft and stretchy properties allowing great flexibility.
- Good puncture and abrasion resistance yet remaining very thin allowing optimum tactility.
- Very resilient and durable.
- Excellent general purpose, multi-industry coating that works particularly well for light manufacturing and small part assembly type operations.

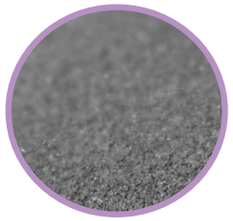
X-DURA LATEX

- Latex has very high elasticity and outstanding grip, especially when it has been processed to form a crinkled surface.
- Crinkle surface styles not only offer great grip, but also cut and tear resilience.
- Ideal for use in handling rough wood, boxes, cut stone, scrap metal, and concrete block.
- Good durability and strength, and is able to withstand extreme temperature.
- The waterproof nature of latex coatings makes it suitable for handling wet machinery/ components.

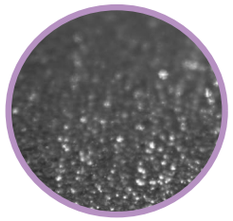
*EN 407 test requirements will apply.

BLENDED COATINGS

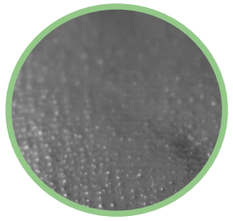
Using our expertise in coating blending and polymerisation we take the unique properties of our leading X-Dura coatings, blending them together, to give unique performance characteristics combining the best properties of each coatings type.



MICRODEX NITRILE



X-DURA NITRILE



X-DURA PU

X-DURA LATEX

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