V-Gard Visors: **How to Interpret Markings**

MSA
The Safety Company

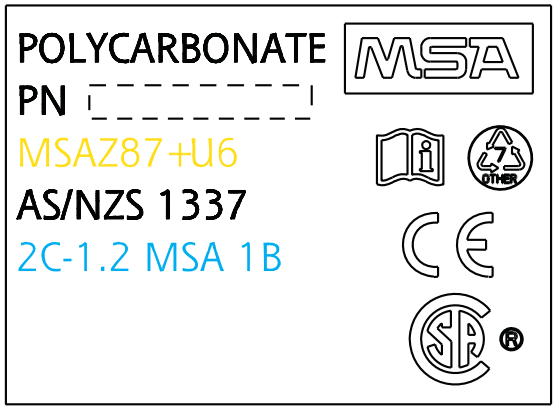
Many V-Gard Visors meet performance criteria other than those addressed in the ANSI/ISEA Z87.1-2010 Standard. There are for example, performance criteria in EN166 that are not covered in ANSI/ISEA Z87.1-2010, including:

- Resistance to high speed particles at extremes of temperature (-23˚F and 131˚F)
- Molten metal and hot solid
- Enhanced reflectance
- Anti-fog and anti-scratch

The chart below will aid in interpretation of the EN markings that appear on V-Gard Visors (in required order of appearance, when applicable):

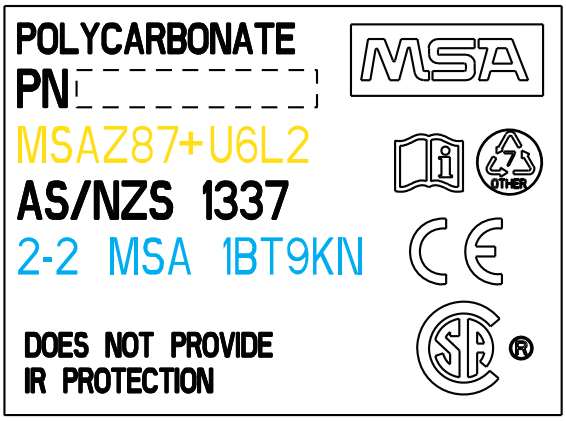
DESCRIPTION	EN166 mark on V-Gard Visors	Explanation	Other comments
FILTER CLASS	2, 2C, 4	2C indicates a UV filter that allows good color recognition 2 indicates a UV filter that may affect color recognition 4 indicates an Infrared (IR) filter	2C or 2 markings indicate filtration of UV >99.9% up to 385 nm 4 is generally a welding filter
SCALE NUMBER	1.2 to 5	1.2 (clear) to 5 (dark tint) Increases with decreasing luminous transmittance of lens	The light transmission values follow the UV filter indicator in sequence (i.e., "2C-1.2")
SHADE	1.2-10	From Shade 1.2 to Shade 10	V-Gard Visors are marked for both IR filtering and welding (i.e., 4-5/5)
MANUFACTURER	Company identifier	MSA	
OPTICAL CLASS	1	1 = high optical quality	All MSA visors are designed for permanent wear
MECHANICAL STRENGTH (OR IMPACT RATING)	F or B	F = low energy impact, 147 ft/s B = medium energy impact, 393 ft/s	"F" mark is found on V-Gard mesh visors only "B" mark is found on EN166 certified V-Gard PC and propionate visors ANSI/ISEA Z87.1-2010 impact tests for faceshields are conducted at 300 ft/s
LIQUID SPLASH	3	Resistance to liquids (droplet or splashes)	Various MSA PC and Propionate visors offer protection against droplets and splashes of liquids
RESISTANCE TO HIGH SPEED PARTICLES AT EXTREMES OF TEMPERATURE (-23˚F AND +131˚F)	T	The visors are conditioned to low and high temperatures (as shown), then impact tested	Can be seen in conjunction with the impact ratings shown above
RESISTANCE TO SHORT CIRCUIT ELECTRIC ARC	8	Faceshield minimum thickness 1.4mm; and a scale number of 2-1,2 or 2C-1,2	In North America, the electrical arc standard is NFPA 70E-2012. **Visors having an EN166 "8" DO NOT meet the performance criteria in NFPA 70E and should not be used in North America for protection against electrical arc.**
MOLTEN METAL AND HOT SOLIDS	9	Molten Metal Test: a sample of Grey iron (2642˚F+ 68˚F) and molten aluminum (1382˚F+ 68˚F) are ejected onto the visor and must not adhere. Hot Solids Test: a steel ball (1652+ 68˚F) is dropped onto the material and must not penetrate for at least 10s.	V-Gard Frames and debris control, as well as V-Gard Headgear, were checked by MSA engineering against Hot Solids using this same methodology; this test is not required for frames or headgear in any Standard.
RESISTANCE TO SCRATCHING	K	Optional requirement	Visors samples are rotated on a plate while 6.6 lbs (+ 0.11 lb) of natural quartz sand is dropped from a nearly 5 ft tall gravity-fed tube. Once the test is complete, the samples are cleaned and the measured light transmission must remain within tolerance.
RESISTANCE TO FOGGING	N	Optional requirement	Visor samples conditioned to water, air and relative humidity are subjected to water vapor (steam). The time required for the light transmission levels to drop to 80% of the unfogged baseline is measured, and visors must remain fog-free for a minimum of 8 seconds.
ENHANCED REFLECTANCE	R	Optional requirement	>60% mean spectral reflectance in the infrared (IR) wavelengths between 780 nm to 2000 nm - the wavelengths specified are known to cause tissue damage to eyes.

To understand which EN166 performance criteria V-Gard Visors have passed, check the markings on the visor itself. The markings are generally found on the upper right side of the visor when the visor is facing you. Below are a few examples to guide you a better understanding these markings.



First marking line (in yellow) shows the visor is impact-rated to ANSI/ISEA Z87.1-2010 (Z87+), and offers maximum UV filter (U6) as indicated under the standard.

Last line (in light blue) shows the EN166 markings. In this example, the visor offers a good color recognition UV filter (2C); luminous transmittance > 74.4% (1.2); is made by MSA (MSA); offers the best optical quality (1) and medium energy impact resistance (B).



First marking line (in yellow) shows the visor is impact-rated to ANSI/ISEA Z87.1-2010 (Z87+), offers maximum UV filter (U6) as indicated under the Standard, and has a visible light transmission filter not more than 43% (i.e., it's tinted).

Under EN166 (last line, in blue), the visor offers UV filter (2); luminous transmittance between 43.2 and 29.1%; is made by MSA (MSA); offers the best optical quality (1) and medium energy impact resistance (B); offers resistance to high speed particles at temperature extremes (T); has passed molten metal/hot solid tests (9) and intensive tests for anti-scratch (K)/anti-fog (N).

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