Quality Control

GKN Aerospace Transparency Systems exercises close control at each stage of the manufacturing process, from raw material through final inspection, to ensure conformity to defined quality standards.

The company is BSI registered, certified against BS EN ISO 9001. It is also approved by the UK Ministry of Defense Procurement Executive and by the UK Civil Aviation Authority as an A1 Primary Company.

Many of our major customers in the Aerospace, Rail, and Defense industries have also granted their approvals.

Military Applications

GKN Aerospace Transparency Systems Bullet Resistant Glazing is the product of choice for armoured military. Apart from the ballistic protection, further product enhancements are also available. GKN ATS will be pleased to discuss the incorporation of any of the following characteristics:

Night Vision Goggle Compatibility
By incorporating high light transmission glass within the construction, windows can be provided to be completely compatible with current Night Vision systems.

Electric De-Icing/De-misting
For vehicles operating in arctic climates, an integral electrical

heating system using GKN ATS's colorless indium-tin-oxide "Hyviz" coating within the window provides efficient de-ice and demist capabilities.

Laser Protection
The threat from laser range finders to the unprotected eyes of military vehicle crews can be overcome using specialized coatings.

Warranty

GKN Aerospace Transparency Systems warrants these products against faults in design, material, and workmanship for a period of 24 months from delivery. The performance levels indicated herein are based on experience and/or actual testing and are given in good faith and are such as could expect to be obtained under similar test conditions. Use of these products in other conditions beyond the control of GKN ATS would be the responsibility of the user who, it is recommended, should perform his own evaluation in such circumstances.

GKN ATS reserve the right to vary the construction of a product to meet operational needs and raw material availability.

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GKN AEROSPACE

Bullet Resistant Glazings
Protecting Your Future

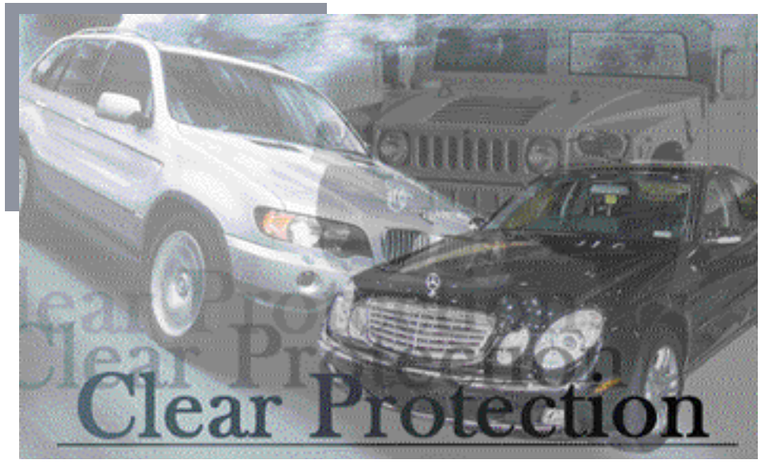
BRG Features

The key challenge in designing Bullet Resistant Glazings for vehicles has been to achieve the required ballistic protection level while keeping weight to a minimum. This is particularly important in vehicular applications to minimize reengineering of the basic structure.

Equally important has been the development of products that exhibit ***'zero spalling'*** - particle projection off the inside surface when under ballistic attack.

GKN Aerospace Transparency Systems has developed a range of glass/polycarbonate composite glazings that combine the long established chemical and abrasion resistance of glass with the superb energy absorbing properties of polycarbonate. These products provide a true '***anti-spall'*** performance.

In addition, a proprietary coating protects the relatively soft polycarbonate surface from scratching and other degradation. This ensures maximum service life while providing the



BMW X5, Mercedes S Class, HMMWV

vehicle occupant with greater laceration protection. These glazings can be manufactured in flat or curved configurations to suit most vehicle applications.

Further technical enhancements are available, including sun shade banding, screen printing, heating of windscreens, windows and backlights and 'dot fade-out' artwork to accurately replicate the standard vehicle's appearance.

In cases where operable windows are required, fully polished edges are provided for all exposed surfaces. To facilitate installation, the edges of a window can be made stepped or rebated, if required.

Product Scope

The range of possible threat levels, in terms of weapons, ammunition, number and locations of shots, is near infinite. Various national and international standards have been developed to classify possible threat levels by defining specific risk categories.

The enclosed chart shows this broad correlation to several key international specifications. However, customers may also

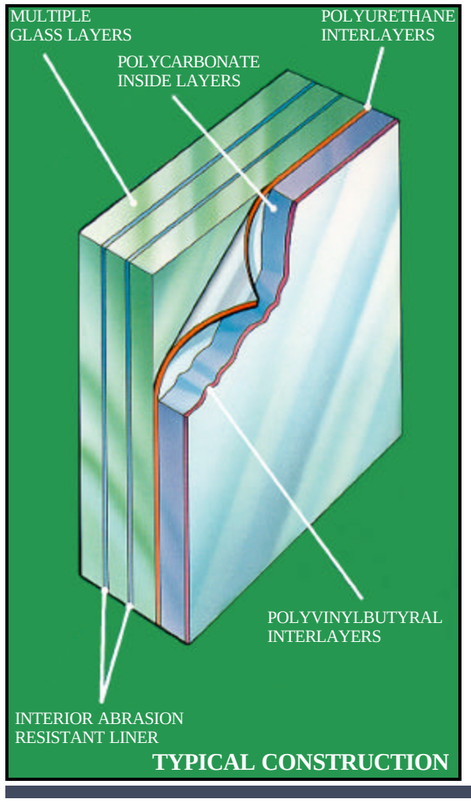
(Continued on Pg. 2)

(Continued From Pg. 1)

specify their own requirements in terms of protection levels, rather than adopting recognized standards.

The chart shows the wide range of products developed by GKN ATS. This data is derived from actual tests.

Higher protection levels and other specialized requirements are under continual development. GKN ATS will be pleased to quote other options.



TYPICAL CONSTRUCTION

Bullet Resistant Glazing Performance Details

GKN ATS Product Part No.'s	Comparable National Standards *1					Weapon	Ammunition			Test Parameters					
	USA	UK	Germany	Europe	Spain	Type	Calibre	Type	Weight (g)	Velocity (m/s)	Number of Shots	Range (m)	Shot Pattern	Thickness (mm)	Nominal Areal Density (kg/m2)
PA 160						Hand Gun	9mm	FMJ/RN/SC	8.0	410	3	5	120mm Triangle	16	33
PA 180	UL1	G0	C1-SF	B2	A00	Hand Gun	9mm	FMJ/RN/SC	7.5	392-405	12	5	4x100mm Triangle	18	37
						Magnum Revolver	0.44"	SMJ/FN/SC	15.6	415	1	5	Centre	18	37
PA 195	UL2	G1	C2-SF	B3	A10	Magnum Revolver	0.357"	CN/SC	10.2	430	3	5	120mm Triangle	19.5	38
PA 220				B4	A20	Magnum Revolver	0.44"	FMJ/FN/SC	15.6	440	3	5	120mm Triangle	22	43
PA 240	UL3	G2	C3-SF			Magnum Revolver	0.357"	Soft Point/FN/SC	10.2	448-463	3	3	110mm Triangle	24	50
PA 275						AK-47	7.62mm	7.62x39/SC (Steel)	7.77	699-704	3	10	170mm Triangle	27.5	57.1
PA 335						AK-47 Rifle	7.62mm	7.62x39/SC (Steel)	7.77	710-715	3	7	125mm Triangle	33.5	72.5
PA 350				B5		Automatic Rifle	5.56mm	5.56x45FMJ/PN/SC SS109	4.0	950	3	10	120mm Triangle	35	75
PA 360				B6		Automatic Rifle	7.62mm	7.62x52 DM41 (FSJ/PN/SC)	9.5	830-840	3	10	120mm Triangle	36	78
PA 390		R2	C4-SF	B6	A40	High Velocity Rifle	7.62mm	7.62x51 FMJ/PN/SC (Steel)	9.45	820-842	3	10	120mm Triangle	39	82
PA 490				B7		High Velocity Rifle	7.62mm	7.62x51 Nato/AP (90° incidence)	9.75	820	1	10	Centre	49	113
PA 580				B7		High Velocity Rifle	7.62mm	7.62x51 Nato/AP (30° incidence)	9.75	820	3	10	120mm Triangle	58	137
PA 725				B7		High Velocity Rifle	7.62mm	7.62x51 Nato/AP (90° incidence)	9.75	820	3	10	120mm Triangle	72.5	172.8

***1 STANDARDS**

UNDERWRITERS LABORATORIES INC
UL 752
BRITISH STANDARDS
BS5051
DEUTSCHE NORM
DIN 52290
EUROPEAN STANDARD
CEN 1063
SPANISH STANDARD
UNE 108-131-86

***2 ABBREVIATIONS**

AP ARMOUR PIERCING
FMJ FULL METAL JACKET
FN FLAT NOSE
HC HARD STEEL CONE
PN POINTED NOSE
RN ROUND NOSE
SC SOFT CORE
SJ SEMI JACKETED

This summary chart is given as a basic guide and reference. Continual development for weight reduction is ongoing. For threat levels or test data not listed, please contact a GKN ATS representative. We have technical resources available to develop new products that meet your unique requirements.

CONVERSION TABLES

1- Millimeters to inches = x.0394
2- Meters to feet = x 3.281
3- (kg/m^2) to (lb./sq in) = x .00142
4- Inches to millimeters = x 25.40
5- Feet to meters = x .3048
6- (lb./sq in) to (kg/m^2) = x 703

GKN AEROSPACE