

## Ultra-High Hardness Lightweight Steel for Armour

A readily machinable ultra-high hardness steel designed for armour plating.



Appliqué armour for fighting vehicles is both expensive and adds weight to the platform. Super Bainite Steel is a low cost ultra-high hardness steel that provides an alternative to current protective armour plate. During live fire trials it has demonstrated performance matching that of current high hardness armour steels and some ceramic armours.

Retrofitted, or appliqué armour, is fitted to military vehicles to give extra protection above that provided by its original armour. It can be fitted to suit a particular threat environment, and allows a vehicle to maintain its operational effectiveness as the capability of hostile ammunition advances. Appliqué armour does however introduce significant cost and weight penalties.

### Super Bainite Steel

Super Bainite Steel (SBS) is a high-performance steel with a ballistic performance at least twice that of conventional Rolled Homogenous Armour (RHA). It is both ultra-hard (600 Brinell) and highly effective against small arms fire.

SBS has advantages over existing high hardness steels as it has lower manufacturing costs and can be more readily formed into shapes other than flat plate.

Shaping can enhance the protection of appliqué armoured vehicles as the armour can better fit the vehicle's contours, improve the continuity of the armoured surface, and allow greater coverage.

### Benefits

- » Ballistics performance meets the same European and NATO standards as ArmoX® 600 and MARS® 300
- » Half the weight for the same level of protection compared with RHA
- » Low cost alternative due to its low chrome and nickel composition
- » Readily machinable in pearlite state or final form using conventional tooling
- » Simple manufacturing process

### Applications

- » Armoured vehicle / compound protection
- » Wear resistant steel components
- » Security barriers

## Description

When used for armour plate SBS is perforated to introduce a large number of edges which disrupt the path of incoming projectiles and in turn significantly reduce their lethality. These perforations not only improve the ballistic performance, it also reduces weight and minimises crack propagation.

The reduced weight can deliver the same level of protection with a 50% weight saving, or alternatively, greater protection for the same weight.

By minimising crack propagation it gives the perforated SBS protection against multiple shots.

## Production

SBS is made with a two phase production process. Initially the steel is produced using a conventional strip steel furnace/production process to make the low-alloy steel, which in its hot state can be rolled and coiled as conventional strip steel.

Following initial production the steel is in a relatively soft pearlite phase and not hardened. It can then be cut, machined and bent into its final form using conventional machine shop tooling.

Hardening is then achieved by using a simple isothermal heat treatment process where the steel converts to fully hardened Super Bainite steel.

## Intellectual property

Patents have been granted in USA, Austria, Germany, Spain, Finland, France, Great Britain, Italy, Sweden. Patent pending in India.

## More information

For more information about licensing this technology, or to speak to us about our other defence and security related IP, please contact us



**ploughshare**

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+44 (0)1794 301052

info@ploughshare.co.uk

[ploughshare.co.uk](http://ploughshare.co.uk)

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