



STEEL, SHEET, BORON TREATED, HIGH STRENGTH (EUROPEAN APPLICATIONS)

WSS-M1A322-A3

1. SCOPE

The material defined by this specification is a fully killed, fine grained, high strength boron treated steel and shall comply with WSS-M99A3-A. It may be coated by a hot dip Aluminum + Silicon coating. Component manufacture shall be via the combined hot forming/die quenching route.

2. APPLICATION

This specification was released originally for 'A' & 'B' pillar reinforcements, where a high strength to weight ratio is required. High strength and toughness is obtained in the component via the combined hot forming/die quenching route. Due to the critical nature of processing, this specification was written for European applications only. For applications in other regions, contact Materials Engineering.

Note: Due to the hardenability response of these materials, individual welding schedules must be developed for each application (see also para 3.5.4).

3. REQUIREMENTS

Material specification requirements are to be used for initial qualification of materials.

3.1 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

3.2 SYSTEMS APPROVAL

The material described by this specification shall be subject to a source "systems approval", i.e. both the component supplier and steel supplier shall be approved in tandem.

3.3 DIMENSIONS AND DIMENSIONAL TOLERANCES

3.3.1 Thickness and thickness tolerances (see para 4.2)

These shall be defined by the relevant company activity. The thickness specified on the engineering drawing or CAD (computer aided design) file shall be a nominal.

3.3.2 Use of Engineering Specifications for Thickness (see also para 4.2)

This para is for FOE (Ford of Europe) and PAG (Premier Automotive Group) ONLY. Parts newly designed (ie. not 'carry-over') for 2006 model year onwards (beginning with EuCD), shall satisfy the thickness and thickness tolerance requirements of ES6G91-1N260-A(-)**.

Date	Action	Revisions
2006 05 03	Revised	Revised 3.5.3, 4.5 (spelling), 4.7, Added 3.3.2 & 4.8, was 4 pages; Del 4.6 K J Thurgood (Ford PDE); S Buckingham (JLR)
2004 07 27	Activated	K J Thurgood (Ford PDE); S Buckingham (Jaguar)



Exceptions to this (for FOE) shall be authorised by PDE Materials Engineering & Testing (ME&T) via MAS (Materials Authorisation System); local procedure V1P-03-132 refers.

Exceptions to this (for PAG) shall be authorised by Materials Engineering.

(** the currently released level)

3.4 OTHER DIMENSIONS, TOLERANCES AND ASSOCIATED ITEMS

- These shall be defined by the relevant national standards (see para 4.3)
- As appropriate to the relevant national standards, the title of this paragraph shall be interpreted to include length, width, flatness, camber and mass.

3.5 REQUIREMENTS FOR FINISHED COMPONENTS

- 3.5.1 Mechanical Properties (after hot forming/die quenching)
(Longitudinal Tensile Specimens) (50 mm Gauge Length (A5 is permissible))
(ISO 6892/ASTM E 8M/EN 10002)

Ultimate Tensile Strength (MPa)	1300 min
Yield Strength (MPa) (see also para 4.6)	950 min
% Elongation	4 min (A5: 6 min)

Unless it is impractical to do so or is otherwise stated on the component engineering drawing or CAD file, tensile specimens shall be taken from the finished component.

- 3.5.2 Chemical Composition (weight percent for heat or cast (ladle))

Carbon	Silicon	Manganese	Phosphorus	Sulphur	Chromium
0.20 - 0.25	0.15 - 0.50	1.00 - 1.40	0.030 max	0.025 max	0.10 - 0.35

Molybdenum	Boron	Titanium	Aluminum	C. E.
0.35 max	0.0015 - 0.0050	**	****	0.60 max.

(** means sufficient to combine with any nitrogen) (see also 4.4)

(**** means sufficient to fully kill the steel) (see also 4.4)

C.E. is defined as $\%C + \%Mn/6 + \%(Cr + Mo + V)/5 + \%(Ni + Cu)/15$