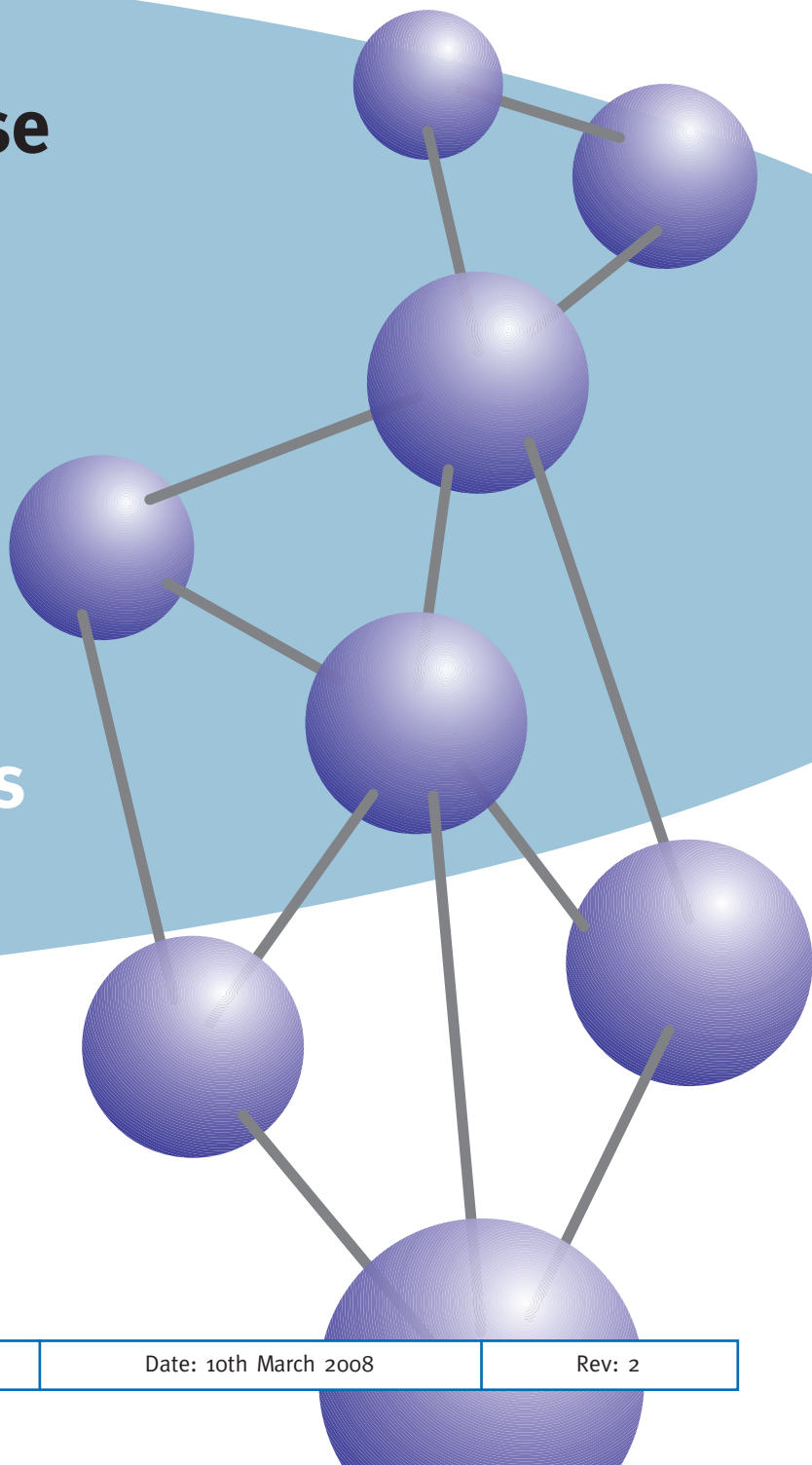




Material Purchase Specification for

Alloy 32760
25%Cr
Superduplex
Stainless Steel
Bar and Forgings



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Alloy 32760 25%Cr Superduplex Stainless Steel Bar and Forgings

Document No. MLA-MPS-48V-BAR/FORG

Date: 10th March 2008

Rev: 2

1.0 Scope

This specification defines the requirements for machined bar and forgings in Alloy S32760, a 25%Cr duplex stainless steel.

2.0 Related Specifications

ASTM A479 UNS S32760
ASTM A276 UNS S32760
ASTM A182 F55 S32760
EN 10088-3 1.4501

3.0 Production Processes

Production process shall follow process route 1X/2B as stipulated in EN 10088-3. Melting shall be by use of Electric Arc Melting followed by Argon-Oxygen Decarburization (AOD) or a similar refining process. All material shall be delivered in a solution annealed and peeled/turned/ground condition.

4.0 Chemical Composition

Cr	Ni	Mo	N	Cu	W	Si _{max}	Mn _{max}	P _{max}	S _{max}	C _{max}	Fe
24.00- 26.00	6.00- 8.00	3.00- 4.00	0.20- 0.30	0.50- 1.00	0.50- 1.00	1.00	1.00	0.030	0.010	0.030	Rem

5.0 Heat Treatment

Alloy 32760 shall be solution treated at a temperature within the range 1060°C-1140°C followed by water quenching. Testing shall be carried out on each heat treatment batch

6.0 Mechanical Properties

Tested to ASTM A370 or EN 10002 Pt1 (tensile) and EN ISO 6506-1 (hardness) (as represented by test material) shall be as follows:

0.2% Proof Stress (minimum)	Tensile Strength (minimum)	Elongation 5.65√SO (minimum)	Reduction of cross section area (minimum)	Brinell Hardness
550 N/mm ²	750 N/mm ²	25%	45%	220 - 270 HB*

*The hardness shall be in accordance with NACE MR-01-75 (latest edition) with a maximum HRC value of 28 (270HB).

7.0 Impact Requirements

Three specimens of each heat of Alloy 32760 shall be impact tested using Charpy 'V' notch impact testing to BS EN 10045-1 at room temperature and -46°C. At room temperature, the minimum impact test results shall be an average of 80 joules for three specimens. At -46°C, the impact testing will be in longitudinal and transverse directions. For the longitudinal tests, the impact energy shall have a minimum average for three specimens of 45 joules and a minimum single value of 35 joules. Results of the transverse tests will be provided as information only.

8.0 Microstructure

The microstructure of each batch of Alloy 32760 shall be examined after solution heat treatment at a minimum of 400X magnification, and verified to be free from grain boundary particles (carbides, nitrides) and intermetallic phases (sigma, chi and laves), as defined by ASTM A 923 Method A. A photomicrograph shall be provided at a magnification of X400 for each batch.

The ferrite content is to be determined in accordance with ASTM E562 and must lie between the values of 35% - 55%.

9.0 Corrosion Testing

Each batch of Alloy 32760 shall be corrosion tested according to ASTM G48 Method A. The temperature used is to be 50°C with an exposure time of 24 hours. The acceptance criteria will be that no pitting attack shall be observable at 20X magnification and that the maximum weight loss shall not exceed 4g/m².

10.0 Non Destructive Testing

Alloy 32760 bar surfaces shall be examined after machining both visually and by eddy current (less than 25mm section only) and ultrasonic NDT methods. The NDT procedures shall be according to the following size-related methods which conform to API 6A Section 7.5.2.3.14.

Section Size Range	Test	Acceptance Criteria
≤38mm	Ultrasound	100% ASTM A388 using a 1.6mm Flat bottomed hole
38-150mm	Ultrasound	100% ASTM A388 using a 3.2mm Flat bottomed hole
>150mm	Ultrasound	100% ASTM A388 using a 6.4mm Flat bottomed hole

For Alloy 32760 forgings, which are supplied in a proof machined condition, it is mandatory to carry out dye penetrant testing. If required by the customer, dye penetrant testing is also employed out on bar products. Dye penetrant testing is carried out in accordance with ASME Section VIII App VIII. No defects are permitted.

11.0 Tolerances

11.1 Bar

Alloy S32760 bars shall be supplied straight to within 2mm in any 1m length.

All bars shall be supplied in the proof machined condition, with dimensional tolerance as follows:

<i>Bars up to 30mm diameter:</i>	<i>+0.15mm/-0.0mm</i>
<i>Bars 31 mm to 80mm diameter:</i>	<i>+0.25mm/-0.0mm</i>
<i>Bars 81mm to 200mm diameter:</i>	<i>+1.00mm/-0.0mm</i>
<i>Bars above 200mm diameter:</i>	<i>+1.5mm/-0.0mm</i>

All bars shall be marked with '48V' and the batch number according to the following:

Bars above 30mm diameter shall have '48V' and the batch number marked on the bar ends.

Bars less than 30mm shall be marked by labels attached to the bundle.

Bars are supplied in random lengths of typically 2500 mm - 4000 mm, unless cut pieces are to be supplied. Bar of lengths up to 6m would be acceptable.

Supply of full bars of shorter lengths than 2.5m would be subject to agreement on a case by case basis.

For the supply of cut pieces, tolerance on the cut lengths would be -0, +6mm

11.2 Forgings

All forgings shall be inspected by Langley Alloys before despatch with the following requirements for dimensional tolerances and identification.

All forgings shall be free of surface defects such as laps, cracks, etc

All forgings shall be supplied in the proof machined condition of surface finish of 125µin CLA or better

Tolerances on machined dimensions shall generally be within the range +1.5mm to +2mm, -0

12.0 Delivery Conditions

In order for goods to be unloaded in a safe manner and be traceable to the associated paperwork, all goods shall conform to the following:

- Maximum bundle weight will be 3000kg. Maximum single bar weight will be 3000kg.
- All goods are to be packed in such a way as to avoid transit damage and be suitable for unloading by forklift truck.
- Documentation shall be supplied with, or prior to, the delivery of the goods.
- Where two or more batches of the same grade or size are supplied at the same time, each batch shall be physically separated and clearly labelled.

13.0 Certification

Alloy S32760 certificates are to be in accordance with BS EN 10204 3.1.



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