



6262E

Specification for ELV aluminium extrusion / forging for the manufacture of machined hydraulic components (low lead / lead free)

1 Scope

This specification outlines the requirements for aluminium extrusion / forging product to be used in applications for the manufacture of hydraulic components. The materials that comply with this specification meet 1 July 2008 requirements as given in the Annex II of Directive 2000/53/EC of the European Parliament and of the Council of End of Life Vehicles (current revision).

2 Application


These materials are intended for use in hydraulic applications. Extrusion / forging products per this specification are typically post-processed via drilling, milling, and grinding, broaching or other process to achieve the final form of the component. Further, the as-machined components may be anodized or otherwise coated to achieve the required functional properties, corrosion resistance or appearance.

3 Material requirement

3.1 Chemical Composition

All materials supplied per this specification shall meet the chemical analysis requirement limits given in the table below.

Element	Acceptable Range (Weight %)
Silicon	0.4 – 1.2
Magnesium	0.7 – 1.2
Manganese	0.8 max
Lead	0.40 max
Bismuth (if applicable)	0.2 – 1.5
Chromium	0.15 max
Copper	0.2 – 1.1
Iron	0.7 max
Zinc	0.25 max
Titanium	0.15 max
Zirconium	0.15 max
Tin	0.05 max
Others (each)	0.05 max
Others (total)	0.15 max
Aluminium	Balance

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				APPROVATO DA: P. Fassio 04/2009
2	04/2009	Tolto supply source	3	 NUOVA TECNODELTA S.p.A. HYDRAULIC PARTS FOR BRAKES AND CLUTCHES FRAZ. POCOLA, 62 - 14016 TIGLIOLE (AT) ITALIA TEL. 0141/668111 - FAX 0141/668145
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3.2 Mechanical Properties

The as-extruded material shall be appropriately solution heat treated, precipitation heat treated, and cold finished to achieve the mechanical properties as specified below. Unless otherwise agreed, tensile test methods shall conform to EN 10002-1. Unless otherwise agreed, the tensile specimens shall be taken from the centre of the extruded profile in the extrusion direction.

Property Type T6			
Sample Thickness (mm)	Ultimate Tensile Strength (MPa) Minimum	Yield Strength (MPa) Minimum	Elongation (%) in 50mm or 5D - Minimum
Up to 6.30	260	240	8
Greater than 6.30	260	240	10

The material properties as specified above are typical of a T6 type temper or similar according Aluminum Association Specifications.

Property Type T9			
Sample Thickness (mm)	Ultimate Tensile Strength (MPa) Minimum	Yield Strength (MPa) Minimum	Elongation (%) in 50mm or 5D - Minimum
Over 3.20 through 50.00	360	330	4
Over 50.00 through 80.00	345	315	4

The material properties as specified above are typical of a T9 type temper or similar according Aluminum Association Specifications.

3.3 Anodising

Unless otherwise specified, all alloys approved per this specification shall have the ability to be successfully anodized (hard anodising and semi-hard , natural anodising).

3.4 Microstructure

The microstructure shall consist of well dispersed, finely divided, and relatively uniform particles of silicon eutectic in an aluminium matrix. Lead or bismuth (if applicable) shall be well dispersed throughout the matrix with no evidence of gross stringers or segregation that may be detrimental to subsequent machining, deburring, forming, anodizing, appearance or part function.

The finished extrusion shall be free from all inclusions and porosity larger than 0.2 mm in diameter or any inclusion or porosity of any size that may be detrimental to subsequent machining, deburring, anodizing, forming, appearance or part function.



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4. *Applicable aluminum grades*

Aluminum grade 6064A registered on 04/09/07 @aluminium association is compliant with this specification.

Other aluminium grades may be used to satisfy the requirements of this specification provided that they meet the given requirements. Nuova Tecnodelta Quality or Technical Office should be consulted if there is any question as to a particular aluminium grade's applicability to this specification.

In order for any grade of material to be approved for use for any application, it must first meet all functional requirements of the application for which it is intended.

Once a certain national, international or proprietary grade of material has been selected and submitted for sample approval, no changes to this grade of material shall be made without prior written consent of Nuova Tecnodelta.