

**ALUMINUM ALLOY (AA 6061-T6), FORGED WHEEL****ESA-M2A124-A****1. SCOPE**

The material defined by this specification is an aluminum forging alloy (AA 6061) with a T6 temper.

2. APPLICATION

This specification was released originally for material used for forged aluminum wheels.

3. REQUIREMENTS**3.1 APPROVED SOURCES**

This specification does not use approved sources. Any reliable supplier meeting these requirements may be used.

3.2 CHEMICAL COMPOSITION

The chemical composition of the heat treated forging must conform to SAE J454 6061.

The chemical composition of the forging shall be checked per procedures outlined in ASTM B108 and in accordance with suitable chemical (ASTM Method E34), or spectrochemical (ASTM Method E1251), or other methods. Metal may consist of a blend of both primary and secondary materials.

3.3 MECHANICAL PROPERTIES, (T6 Temper)
(ASTM B557 and E10)

3.3.1	Yield Strength (0.2% Offset)	248 MPa (36 ksi) min
3.3.2	Tensile Strength	276 MPa (40 ksi) min
3.3.3	Elongation	10% min
3.3.4	Brinell Hardness (500 Kg, 10 mm ball)	80 BHN min

3.4 HEAT TREATMENT

T6 temper (modified to meet required mechanical properties)

3.5 MICROSTRUCTURE
(ASTM E3)

No cracks, laps, folds, seams, incipient melting, or center bursts are allowed that would adversely affect the function of the forged component.

Date	Action	Revisions	Rev. 3
2017 05 31	Re-activated	See Summary of Revisions	C. Taylor, NA
2014 10 15	N Status	Replaced with SAE J454 6061-T6	C. Myraena, NA
1982 06 16	Released	CSM2-896911-C	



Forgings shall be evaluated for adverse grain flow run-out at high stress locations. The frequency for these checks shall be agreed upon between the supplier and Ford product engineering.

4. GENERAL INFORMATION

The information given below is provided for clarification and assistance in meeting the requirements of this specification. Contact gmfs@ford.com for questions concerning Engineering Material Specifications.

4.1 APPROVAL OF MATERIALS

Suppliers desiring approval of their materials shall first obtain an expression of interest from Purchasing, Design or Product Development, and Materials Engineering. The supplier shall submit a completed copy of their laboratory test reports, signed by a qualified and authorized representative of the test facility, demonstrating full compliance with all the requirements of the Material Specification. Tested material samples must be available for review upon request and kept for a minimum of one year. Upon request, the supplier will review the associated quality control documents (Process Failure Mode and Effects Analysis, Control Plans, Certification testing) with Ford.

4.2 SUPPLIER'S ONGOING RESPONSIBILITY

All materials must be equivalent in all characteristics to the material upon which approval was originally granted.

Prior to making any changes to the material originally approved, whether or not such changes affect the material's ability to meet the specification requirements, the supplier shall notify the affected Supplier Technical Assistance (STA), Purchasing, and Materials Engineering activities of the proposed changes (with reasons) by submission of a completed Suppliers Request for Engineering Approval, SREA.

For parts and components using Ford Engineering Material Specifications, all samples tested to the specifications for Design Verification (DV), Production Verification (PV) and Production Part Approval Process (PPAP) sign off must be kept until Job 1.

4.3 RESTRICTED SUBSTANCE MANAGEMENT STANDARD

Substance restrictions imposed by regulations or Company direction applies to the materials addressed by this document. The restrictions are identified in the Restricted Substance Management Standard WSS-M99P9999-A1 which is updated yearly. It is the supplier's responsibility to comply with this standard on a continuing basis through IMDS and or GMAP reporting.

5. SUMMARY OF REVISIONS

2017 05 31

- Removed ASTM E607 from paragraph 3.1 because method was withdrawn
- Moved summary of revisions to paragraph 5
- Added paragraphs 4.1, 4.2, 4.3 (approval of materials, supplier's ongoing responsibility, restricted substance management standard)

2014 10 15

- Move to N Status and replace with SAE J454 6061-T6

2009 03 04

- Deleted defined wheel chemistry from section 3.1. Replaced with SAE J454, 6061.