Aluminum alloys

Category:

Low CTE
High strength
High modulus

Aluminum-alloys for Optics

AMT has three alloys available for Optical application. All of them show significant improvement compared to conventional Aluminum alloys for Optics. The can be polished to a much higher precision.

1. **Al-MS6061**: Powder based Aluminum A6061 alloy. Because of the very small grain size strenght and elongation is increased. Compared to conventional A6061 surface roughness can be increased by a factor of 4 if Diamond machined.

2. **Al-MS95**: A high strength powder based Aluminum alloy. If a higher strenght is required Al.MS95 is the choice. Often used for Moulds and Inserts, Al-MS95 offers advantages compared to conventional alloys like brass- Cu-Ni, Cu-Be.No coating or post achining is required. Surface roughness can be below 1nm.

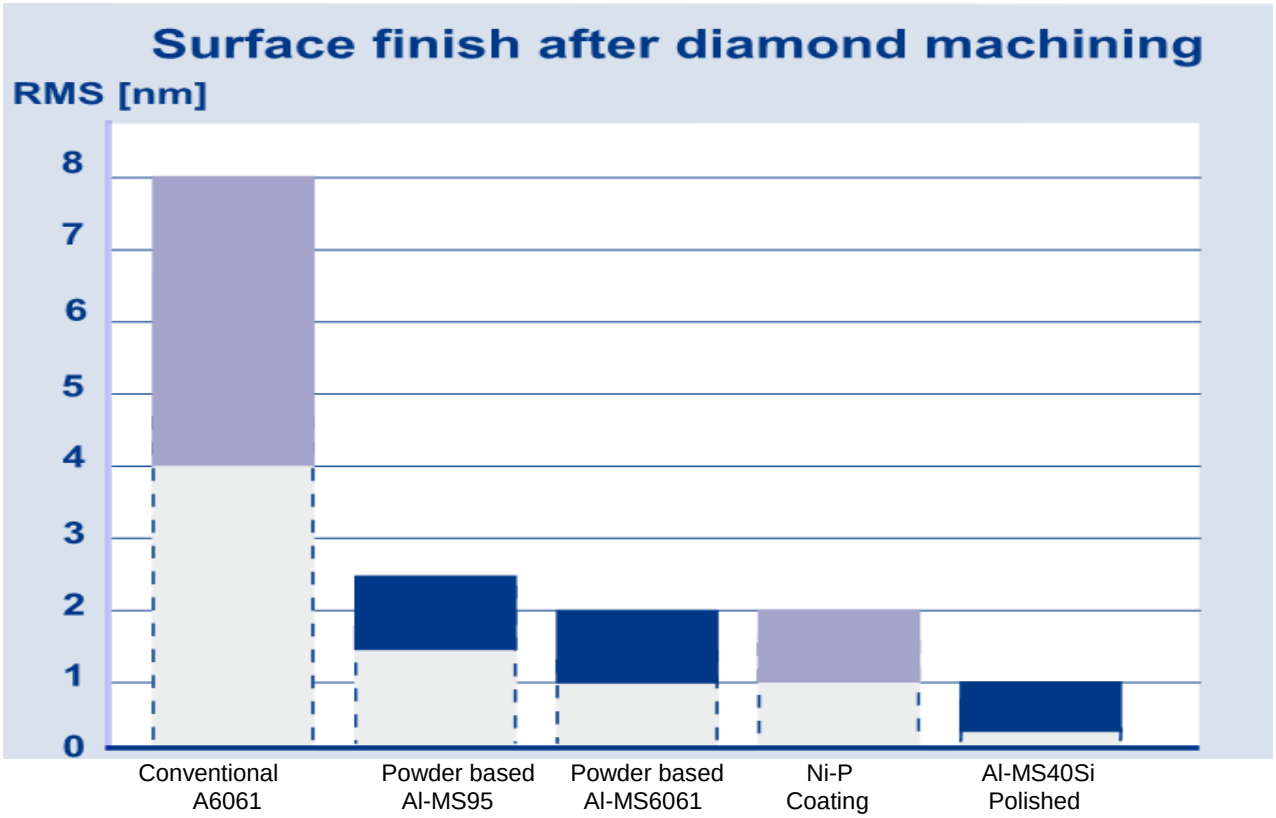
3. **Al-MS40Si:** Al-MS40Si shows a low CTE comparable to Nickel. Bi-meatllic effects can be avoided if Nickel coated. The modulus of Al-MS40Si is above 100GPa. Very stiff and owweight mirrors can made of it.

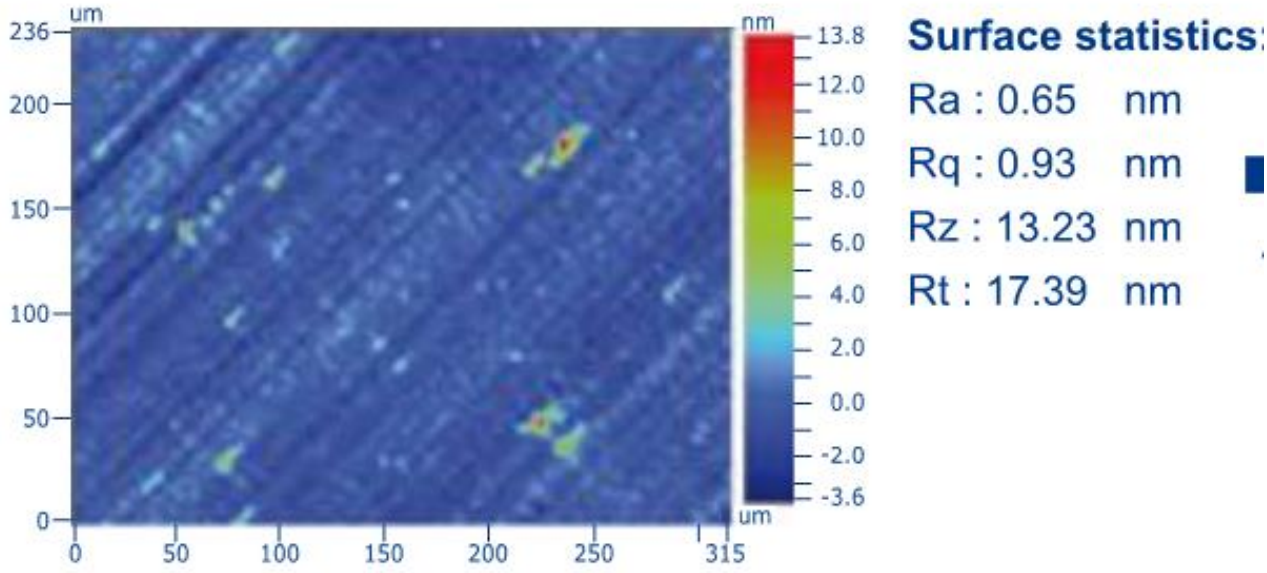
4. **Al-SF52:** Al-SF52 shows a low CTE, high elastic modulus, high temperature strength, excellent machining behavior.

	Unit	Al-SF52	Al-MS6061	Al-MS95	Al-MS40Si
Alloy					
Process		**Powder**	**Powder**	**Powder**	**Powder**
Elastic modulus	**Gpa**	**95**	**70**	**92**	**102**
Density	**g/cm^3**	**2,83**	**2,70**	**2,95**	**2,54**
Yield strength	**Mpa**	**410**	**295**	**480**	**150**
Tensile strength	**Mpa**	**445**	**330**	**620**	**250**
Elongation	**%**	**1**	**12**	**6**	**1**
Hardness	**HB**	**210**	**100**	**180**	**105**
Thermal Expansion	**ax10^6-**	**16,7**	**23**	**19**	**13,5**

Fig. 1: Properties of Aluminum alloys for Optics

AMT Advanced Materials Technology Germany Tel.: +49-6257-505-1790
Street: Huegelstrasse 9 Fax.: +49-6257-505-1792
Zip, City: 64404 Bickenbach Mail: DB-AMT@web.de





AMT Advanced Materials Technology
Street: Huegelstrasse 9
Zip, City: 64404 Bickenbach
Germany
Tel.: +49-6257-505-1790
Fax.: +49-6257-505-1792
Mail: DB-AMT@web.de