RSP Alloys
Optics

RSP Technology develops, produces and sells aluminium super alloys with high end properties.
By using its own Meltspinning process, ultra fast cooling rates can be reached, converting more than 1 million degrees per second.
As a result very fine nanostructured alloys with new functionalities are being developed and produced.
For the optical industry there are 3 main application areas:

1. Diamond machined mirrors

1 A. By replacing conventional 6061 with RSA-6061, surface roughness can be improved by a factor of 4.
RSA-6061 can be delivered under official qualifications EN-755 and ASTM-B221.
1 B. If better properties are required, RSA-905 offers improved mechanical and physical properties.
1 C. RSA-443 can be used as mirror body with high stiffness and low thermal expansion matching Nickel coating.
So bi-metallic effects do not exist anymore. The Nickel coating determines the surface finish; RMS values 1 - 2nm.
1 D. RSA-902 is a trimmed down RSA-905; offering easier machining, higher reflectivity, higher ductility; typical RMS 1,5nm.
Particularly available in diameters 8 - 16mm; also large dimensions are possible.

2. Mould and insert applications

Better and cheaper than any other alternative:
RSA-905 offers huge advantages compared to conventional Cu-based alloys like brass, Cu-Ni and Cu-Be.
- simple logistics and low cost as no coating operation nor post machining is required.
- increase of mould life with about 100% compared with a Nickel coated surface.

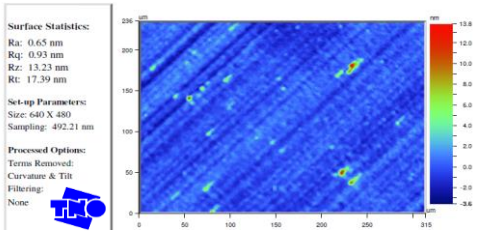
RSA-902 is a trimmed down version of the RSA-905.

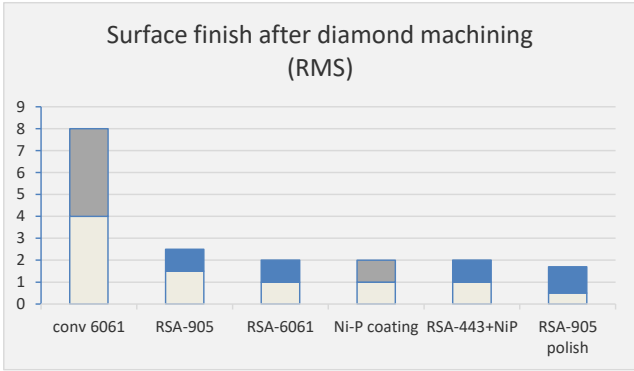
3. Polished mirrors

3 A. RSA-443 can be used as mirror body with high stiffness and low thermal expansion matching Nickel.
The polishable Ni-P coating offers RMS values < 1nm.
3 B. RSA-905 is a polisheable aluminium alloy offering RMS values <1nm.
Initial tests look promissing; MRF offers great opportunities.
3 C. RSA-902 is also polisheable down to RMS values <1nm.

RSP alloys can be produced in the following standard dimensions:

Bars: diameters 18, 22, 26, 35, 45, 60, 65, 85, 105 mm
Billets: diameters 200, 290, 360, 460, 510, 610, 900 mm
Any other size can be custom made in round, rectangular or any other shape up to 1.000 mm





			Physical properties					Mechanical properties			
Alloy	condition	Typical composition	Density ρ [gr/cm^3]	Thermal expansion α [10^{-6}/K]	Stiffness E-mod [Gpa]	Specific stiffness	Thermal conductivity k [W /m.K]	Ultimate Tensile Strength UTS [Mpa]	Yield Strength YS [Mpa]	Elongation e [%]	Hardness [HB]
RSA-6061	T6	Al Si0,6 Cu0,3 Mg1 (AA6061)	2,70	22,6	70	26	165	340	315	16	110
RSA-443	T0	Al Si40	2,54	13,6	102	40	135	225	155	1,5	105
RSA-905	T0 / AN	Al Fe2,5 Ni5 Cu2,5 Mn1 Mo0,8 Zr0,8	2,95	19,0	90	31	115	600	480	5	180
RSA-902	T0	Al Ni2,5 Cu2,5 Mn1 Mo0,8 Zr0,8 Ti0,6	2,84	20,0	87	31	130	410	350	15	125
AA-6061 (Conv.)	T6	Al Si0,6 Cu0,3 Mg1 (AA6061)	2,70	22,6	70	26	160	310	275	10	95