Rapid Solidification
Aluminium as strong as titanium
RSP Technology BV is an innovative firm, specialised in the development, production and marketing of Rapidly Solidified Aluminium (RSA) and its (semi-finished) products.

RSP Technology uses a rapid solidification process called ‘meltspinning’, which generates aluminium with properties superior to conventional aluminium alloys.

Markets
- automotive industry
- aerospace industry
- sports industry
- electronics
- machine building
- markets that demand special requirements.

Advantages
- Higher strength
- Lower thermal expansion
- Superior surface finish
- Good machining properties
- Better wear resistance

Meltspinning process
During the meltspinning process, molten aluminium hits a fast rotating wheel and almost instantaneously releases a continuous metal ribbon at room temperature. This ribbon is converted into flakes and finally into an extrusion product, after which a special heat treatment may be applied. The same Rapid Solidification Process forms from the sudden temperature drop that takes place at a rate of more than 1,000,000°C per second as the aluminium comes in contact with the wheel.

RSP Alloy applications
Thanks to RSP Technology’s unique meltspinning technique, RSP alloys exhibit properties and features far beyond the limits of conventional alloys. This is due to:
- a much finer microstructure;
- far more flexibility in alloying than conventional alloying techniques.

RSP Technology focuses on several different types of applications:
- High strength and low thermal expansion at temperatures up to 400°C (RSA-43X, AlSi).

RSP microstructure
Thanks to the rapid quenching of the meltspinning process, grain sizes are very small (± 2 micron). Intermetallic phases and non-soluble constituents are refined and homogeneously distributed into the matrix and are characterised by a more favourable morphology. To a large extent, these factors contribute to an improved ductility of RSP. The pictures on the right show the difference in microstructure between RSP and a conventional cast aluminium alloy with an identical chemical composition.

Alloy flexibility
The natural maximum solvability imposes major limits to the content of alloying elements in conventional DC casting. The meltspinning process, however, generates ultra fast cooling rates. This creates great flexibility, thereby allowing the production of new and exotic alloy compositions such as AlSi40%X or AlFe15%X. Thus meltspinning is capable of providing custom-made solutions for applications that demand special requirements.

RSP product forms
RSP alloys are available in flakes, billets, bars, extrusion profiles and wires. Further processing may include forging, machining, bending and anodising.

Graph: RSP fills in the gap between aluminium and titanium

Graph above: RSP - High Strength Alloys

Graph below: RSP - Piston Alloys

Graph: RSP 5%Ti in the gap between aluminium and titanium