



GRÄNGES

Gränges Powder Metallurgy DISPAL[®] 7075/8

Thursday, April 14, 2022

7xxx Alloys

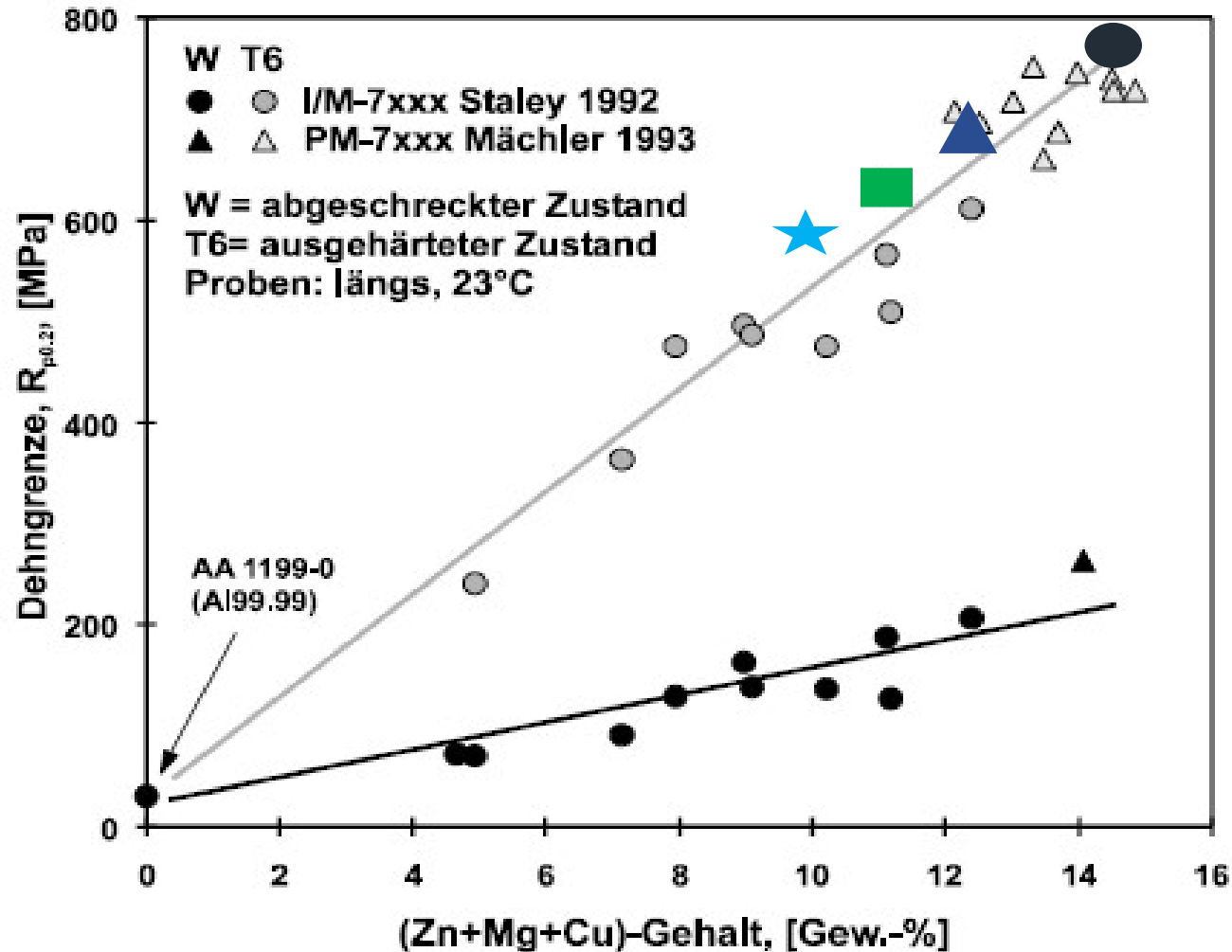
Spray Formed



DISPAL S7075 Project

Thesis for increasing strength S7075 PM with Zn (5.6% => 8%)

• Al-Zn



Example DISPAL S790 (AlZn11Mg2Cu1CrZr) ●

- max. Strength in combination with good elongation and fracture toughness

Disadvantage:

- Possible difficulties in case of spray compaction process due to high content of Zn (>> 8%) makes problems in case of exhaust system and filter.

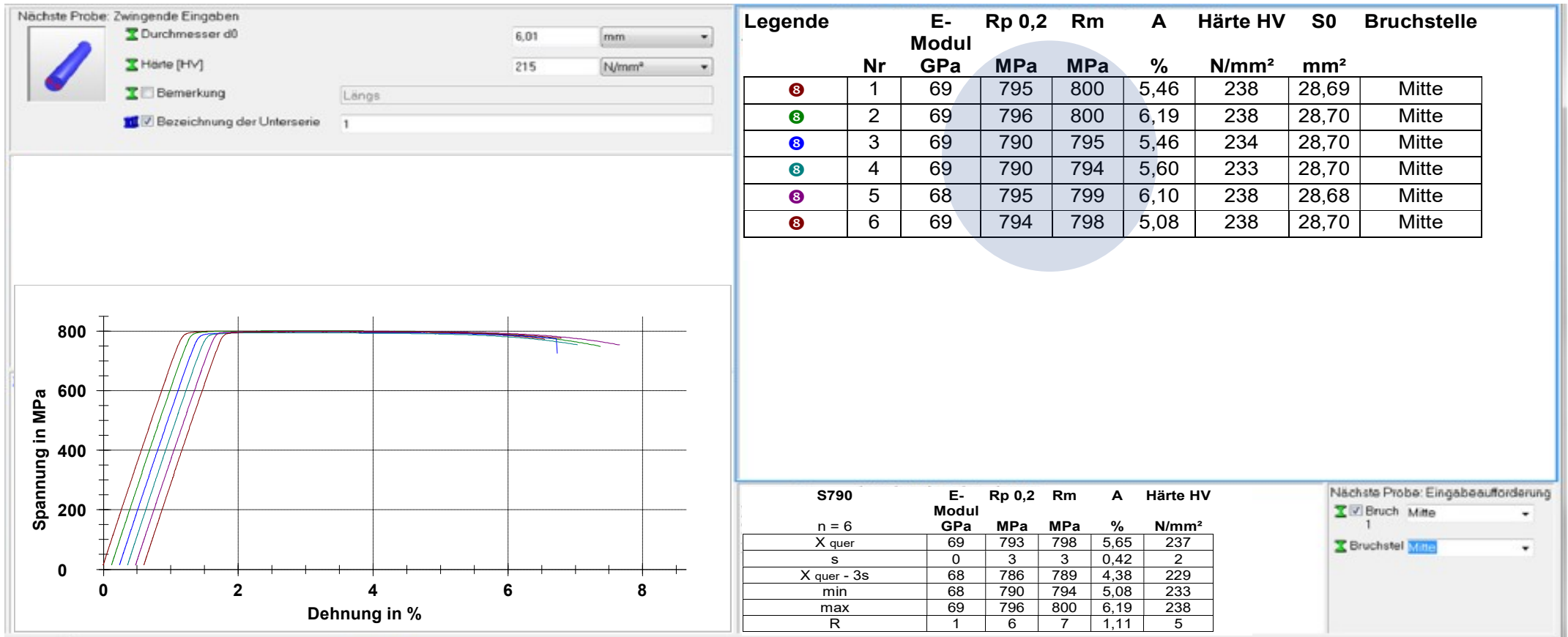
Target of new S7075 alloy:

- Reduced Zn content ($\leq 8\%$) in combination with high strength and nearly isotropic properties, higher than known for conventional 7075-alloys.

- ▲ AlZn8Mg2,5Cu1,8
- AlZn6,8Mg2,5Cu1,8 (interp.)
- ★ AlZn5,6Mg2,5Cu1,8

High Strength

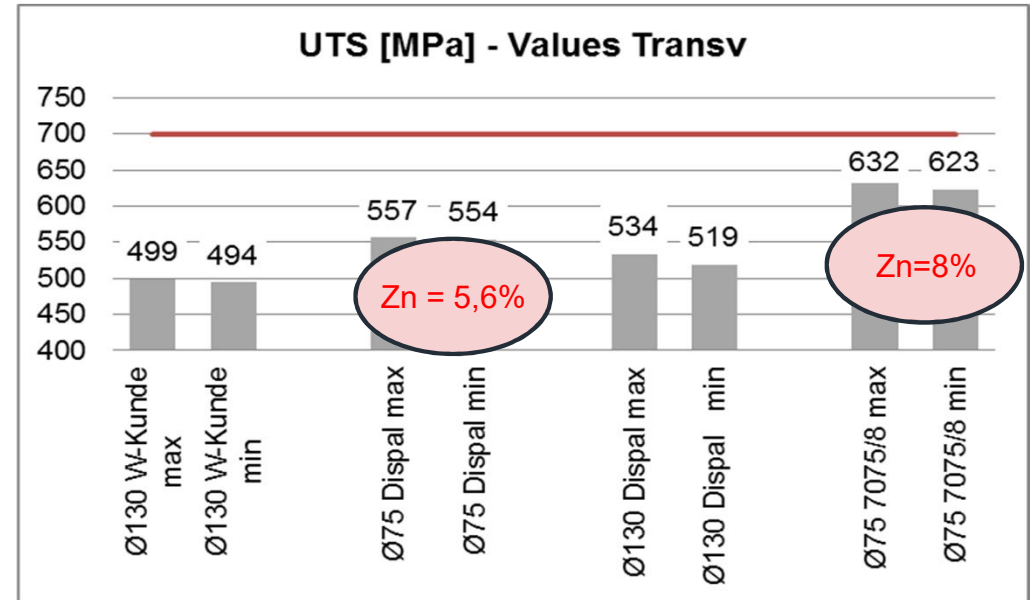
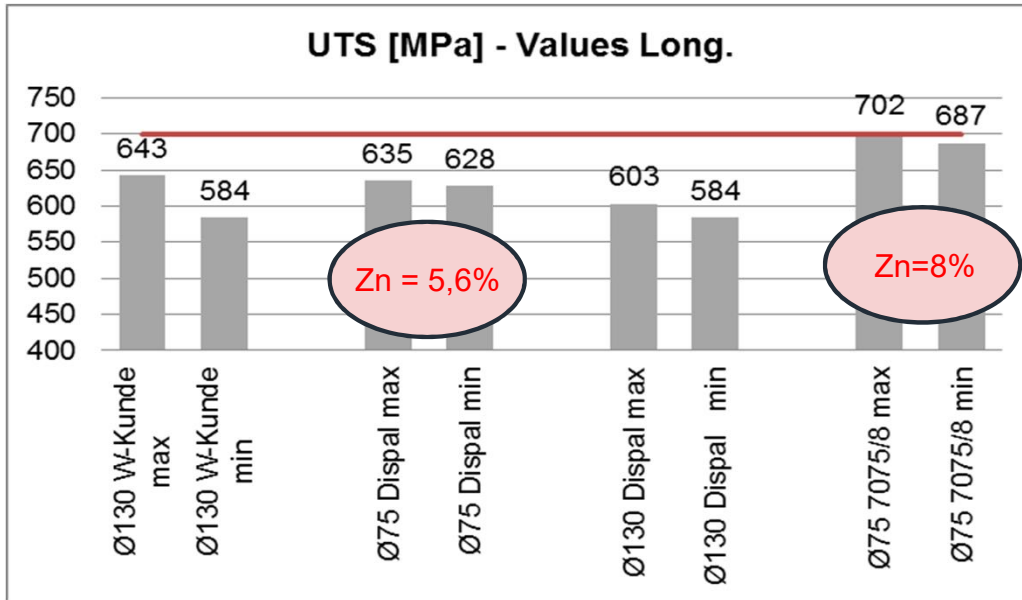
Example: DISPAL S790* (AlZn11Mg2,3Cu1,1CrZr)



* DISPAL® S790 by Osprey, Profile Ø 11, Deformation Ratio (D) 1:25, Direct Extrusion, Heat Treatment T6

DISPAL S7075 (AlZn5,6Mg2,5Cu1,8/ AlZn8Mg2,5Cu1,8)

UTS @RT, DISPAL S780 T6 Ø75/130 mm vs. Competitor 7075 T6511/ Ø130 mm:



Extruded Condition:

L= Logitudinal;

Q = Transverse.

First values.

Competitor Ø 130 mm,

D = 1:10,

max. Values/ min. Values

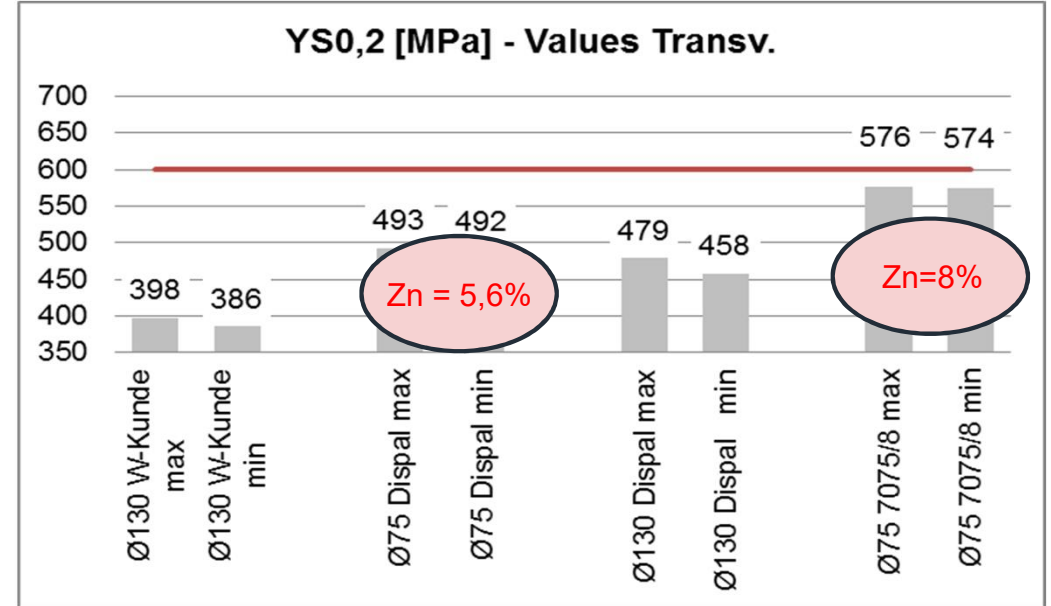
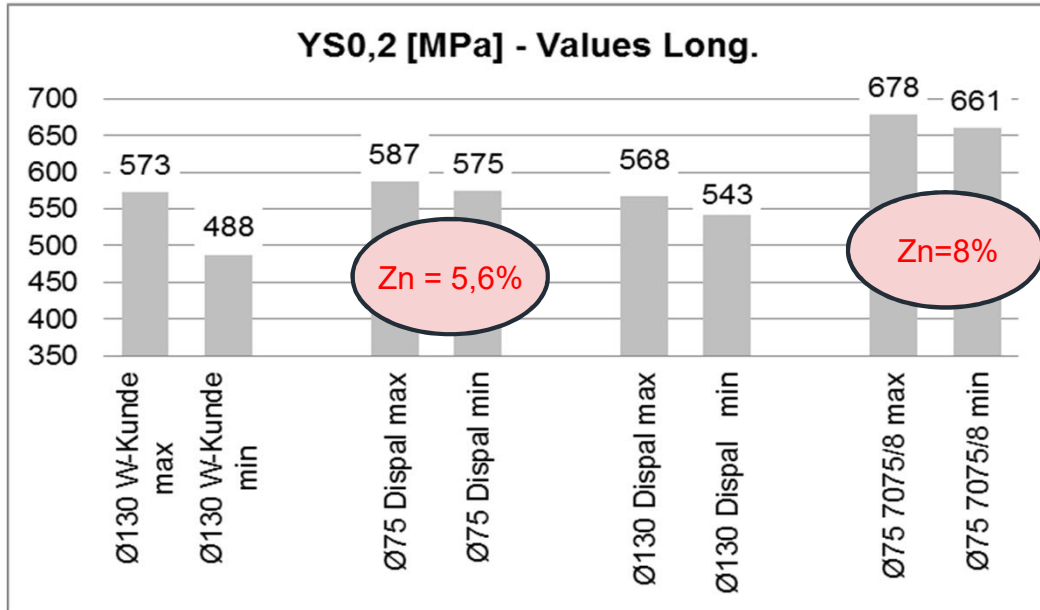
EAL Ø 75 mm,

D = 1:16,

max. Values/ min. Values

DISPAL S7075 (AlZn5,6Mg2,5Cu1,8/ AlZn8Mg2,5Cu1,8)

Yield strength @RT, DISPAL S780 T6 Ø75/130 mm vs. Competitor 7075 T6511/ Ø130 mm:



Extruded Condition:

L= Logitudinal;

Q = Transverse.

First values.

Competitor Ø 130 mm,

D = 1:10,

max. Values/ min. Values

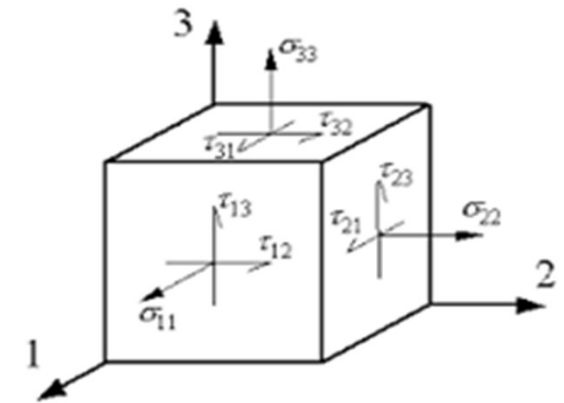
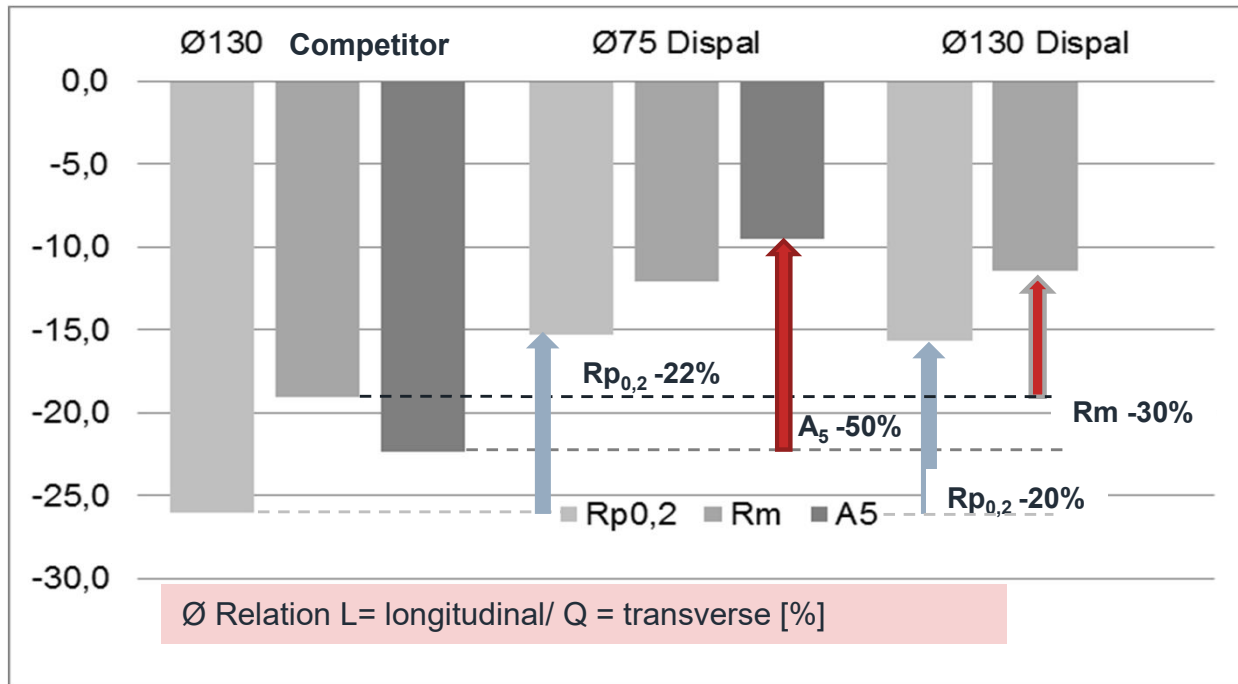
EAL Ø 75 mm,

D = 1:16,

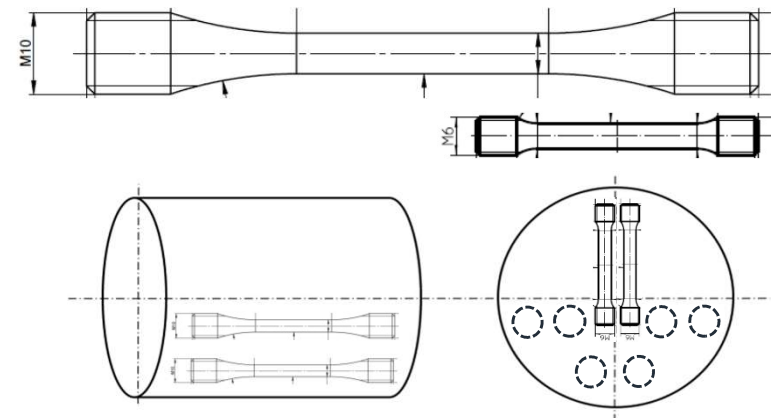
max. Values/ min. Values

DISPAL S7075 (AlZn5,6Mg2,5Cu1,8) Project

Tensile test @RT, DISPAL S7075 T6 Ø75/ 130 mm vs. Competitor 7075 T6511 Ø 130 mm:



Improved isotropic behaviour for spray compacted S7075



Extruded Condition. L= Logitudinal; Q = Transverse. First values.
 Competitor Ø 130 mm, D = 1:10, max. Values/ min. Values
 EAL Ø 75 mm, D = 1:16, max. Values/ min. Values