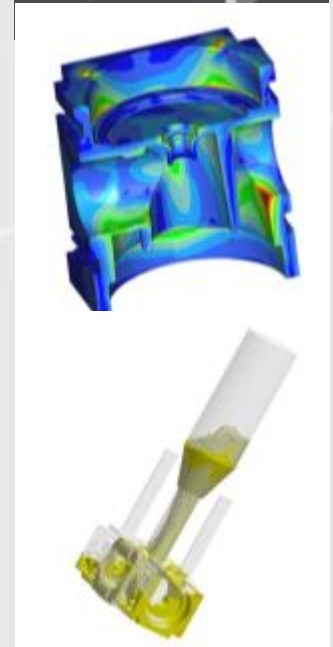
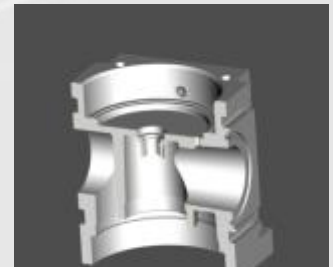
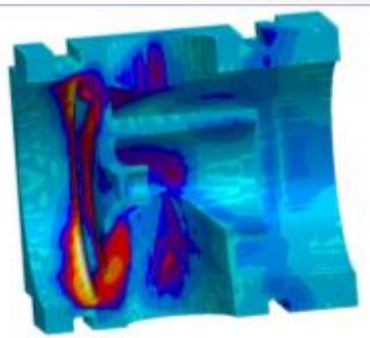


Casting solutions of the Spacecast company

from rapid prototyping to rapid
manufacturing
latest materials, produced by precision
casting methods

Customer benefits

- Rapid production of cast parts from available design data
- Prototypes can be produced without the aid of a “casting-compatible” design
- Cost-effective process, as no tool costs are incurred
- Minimum risk of bad investments (e.g. tools / equipment)
- The “cast design” can be produced and tested initially without the reference to the subsequent serial production process



- Process development: All steps in the casting process
- Rapid Prototyping and Rapid Manufacturing of castings
- Single parts and small series (quantities from 1 to 1.000)
- Delivery times from six working days for first parts
- Advice and guidance from a permanent personal point of contact

- Aluminium alloy e.g. AlSi7Mg, AlSi9Mg, AlMg5
- Iron alloy e.g. 0.7668, GJS 400, GJL250, GJVSiMo
- Cobalt alloy e.g. stellite, CoCr29Mo
- Copper alloy e.g. GBz10, 2.0492(silicium-brass)
- Magnesium alloy e.g. AZ91, RZ 5, WE 54
- Nickel alloy e.g. IN 713, IN 718, 2.4605, Hastalloy X
- Ferrous alloy e.g. 1.4581, 1.4308, 1.4848, 1.4317, 1.7225
- Titanium alloy e.g. Ti-Grade2, TiAl6V4, TiAl46Cr2Nb2
- Zinc alloy e.g. Z410, Z430
- Special alloy e.g. intermetallic materials

- 3D-measurement
- Non-destructive material tests: dye penetrant tests, radiographic examination for aluminium up to 150kV
- Compression tests, helium leak detectors
- Material certificates, spectral analysis of all materials
- Metallography, mechanical characteristics through external institutes
- Vacuum-impregnation (IM 3000)

Service spectrum

Service spectrum

CAD-Data

construction

SLS-
laser-
sintering

3D-
Printing

3D-Wax-
plotting

Stereo-
lithography

HSC-Wax-
milling

CNC-tool-
assembly

silicone
profile

metal-
profile

Plastic design model

Wax design model

Compact casting

shell mould casting

Operational procedure



Lasersintering



Finishing



Densitometry



Melt degassing



Temperature control



Mold firing



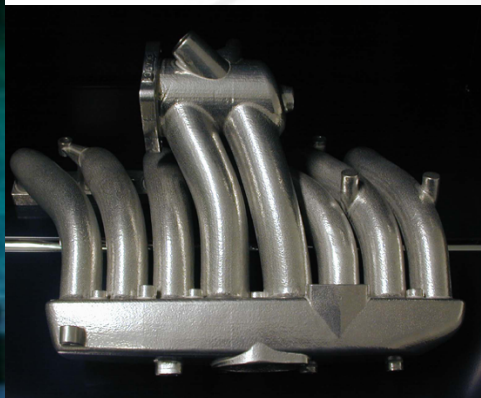
casting

dimensions depend on demanded materials

- From sparse mm to 1000 mm edge length
- Wall thickness from 0,5 mm
- Weight from less than 1 g to 100 kg

Automotive industry

- Rapid Manufacturing of single parts and small series



Automotive industry

- Rapid Prototyping of single casts and small series



single components in low quantities

- wax milling model
- wax print model



Small series up to 100 pieces

- Silicone profiles
- Plastic-waxpattern-models



Kleinserien bis 10000 Stück

- Aluminium-waxpattern-models

Rapid Manufacturing



Example:



shell mould casting via SLS-
polystyrene patterns
dimensions: \varnothing 519 x 266
weight: 4,6 kg
material: stainless steel 1.4308
pieces: 4
Production time: 21 working days



Customer's requirements:
Old, damaged element.
Our service:
measurement and redesign
incl. Requirements and
specifications

Aviation and automotive industry

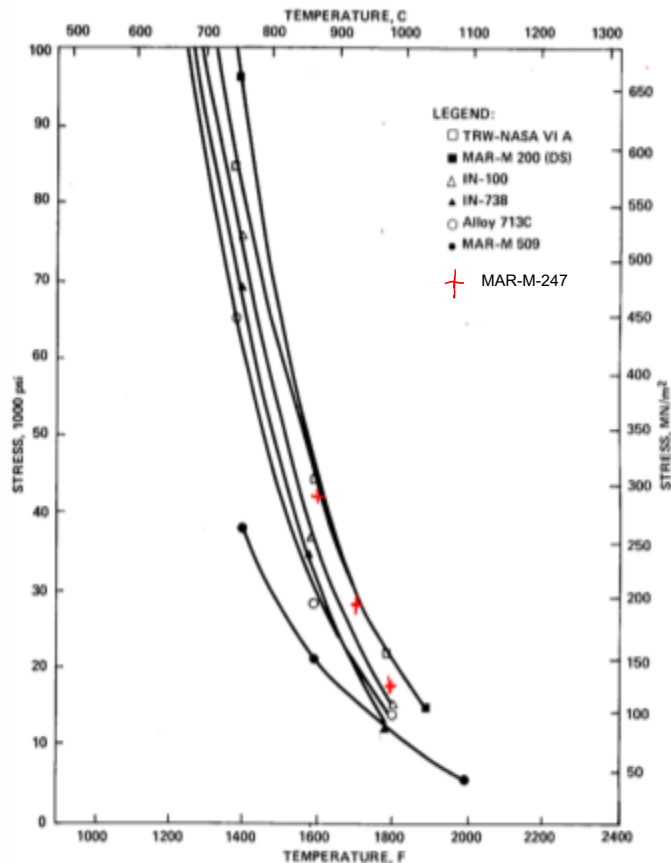


Vacuum induction
centrifugal casting
„Supercast“



- o Turbine blades
- o Blade wheels

Materials for turbine blades



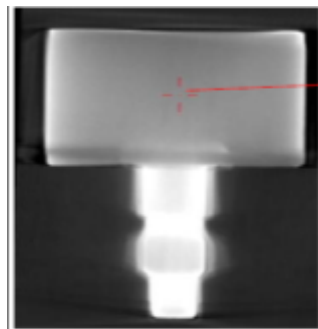
○ IN 713 c

○ MAR M 247

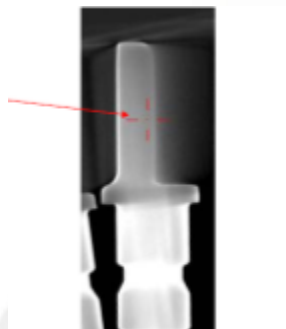


MAR M 247 CT-examination „guide blades“

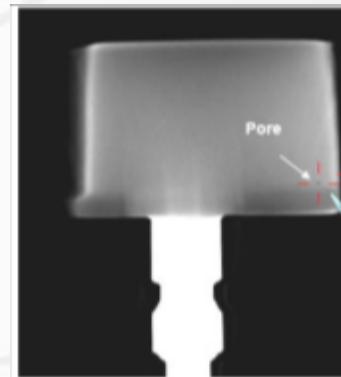
- mass 10g, dimensions 25x25x6mm
- Limit of traceability 60 μ m (Voxelsize 40 μ m)



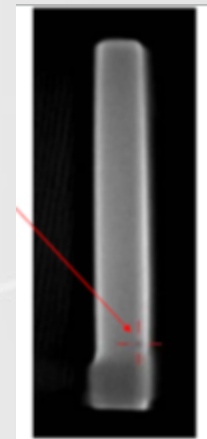
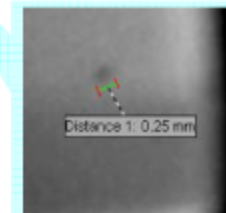
Frontalsicht



Seitenansicht

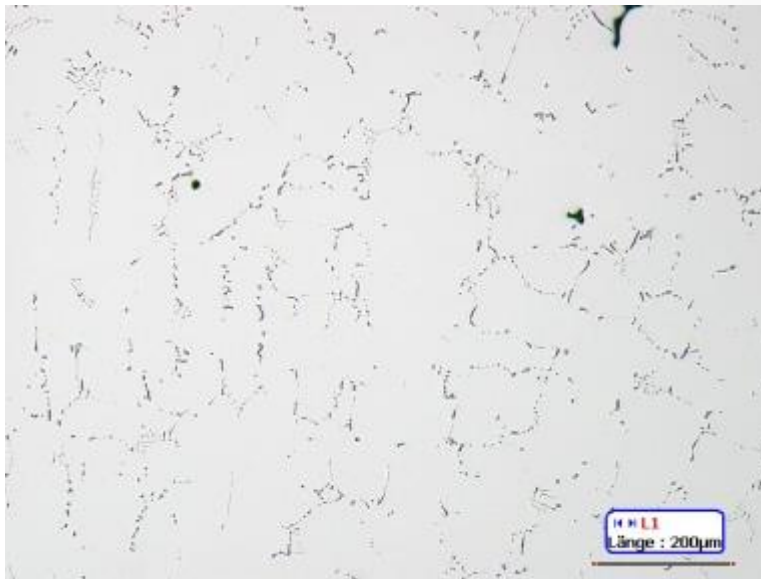


Frontalsicht



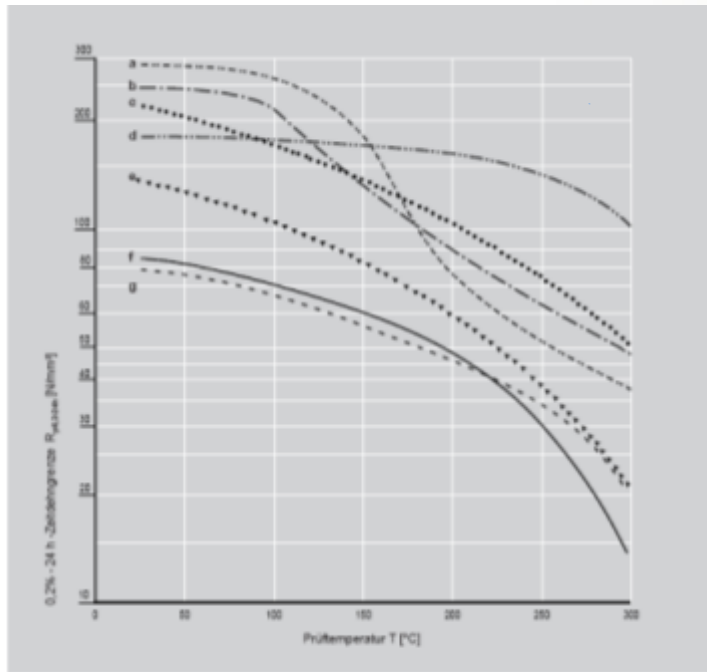
Seitenansicht

- Polished surface; max. porosity 15µm
- Carbide films; cast state



Structural conditions of hub area Structural conditions of scoop area

- AlSi9Mg, most commonly used
- AlZn10Si8Mg, higher cohesiveness without temperature treatments



0,2% - 24 h Zeitdehnengrenze verschiedener Gießlegierungen in Abhängigkeit von der Temperatur (Kokillengießproben).

a	SiAlfont-30	warmausgehärtet	AlSi9Mg	T8
b	Unifont-90	Selbstaushärtung	AlZn10Si8Mg	T1
c	SiAlfont-70	stabilisiert	AlSi12Cu8Mg	T5
d	Alufont-67	kaltausgehärtet	AlCu4NiMg	T4
e	SiAlfont-09	Druckguß-Zustand	AlSi9	F
f	SiAlfont-13	Gußzustand	AlSi11	F
g	Perakman-30	Gußzustand	AlMg3	F

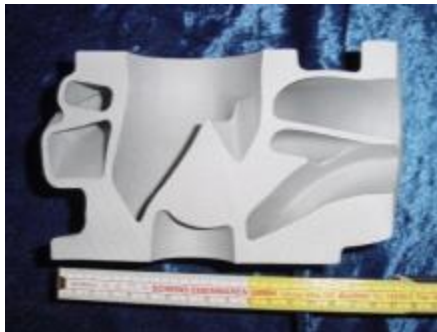


Wax pattern,
Laser sintered
Polystyrene

Exhaust gas temperature

- ✓ Up to 680° C grey iron, spheroidal graphite GJS400
- ✓ Up to 760° C GJS Si Mo 5 1
- ✓ Up to 850° C GJS Si Mo 4,5 0,6
- ✓ Up to 970° C GJS NiCrSi 35 5 2 (Ni-Resist D5S)
- ✓ Over 1050 ° C heat resistant, austenitic steel casting, e.g. 1.4848, 1.4849 and more
- ✓ Also possible: IN 713C or other High-vacuum cast alloy
- ✓ Above 850° C: water-cooled systems
- ✓ Latest materials possible

Example: blast turbine



Model:
SLS-polystyrene wax pattern

Material:
G-X 40 CrNiSi 25 20 (W.-No.: 1.4848)

Production time:
20 working days

Pieces:
each construction in 3 pieces

Dimensions:
150 x 160 x 145 mm

Weight:
4,5 kg

Example: thin walled steel castings



Model:
SLS-polystyrene pattern

Material:
G-X 40 CrNiSi 25 20 (W.-No.: 1.4848)

Production time:
20 working days

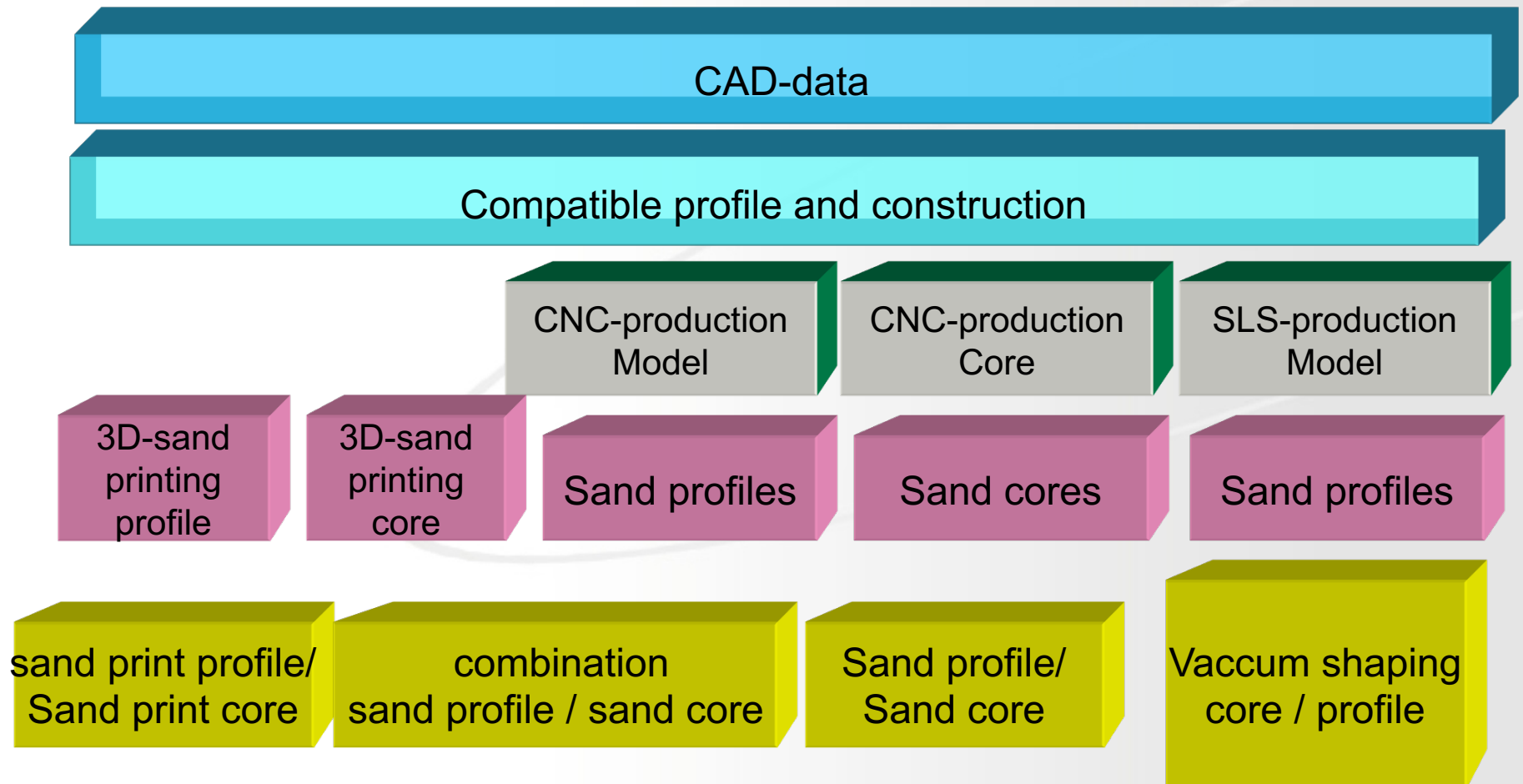
Pieces:
each construction in 3 pieces

Wall thickness:
2 mm

Dimensions:
350 x 135 x 155 mm up to
max. 700mm possible

Weight:
0,2 - 2,5 kg

Service spectrum – sand casting-



Process Routes – Vacuum-Mold-Sandcasting –



Iron-Castings
0.7688



Aluminum-Castings
AlSi7Mg



Example: sand casting in combination with compact castings



Sand casting
Production time: about 40 working days

Compact casting
Production time: about 16 working days



- Rapid Prototyping and Rapid Manufacturing
- Casting simulations
- Cast procedure support
- R & D - projects

Contact



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