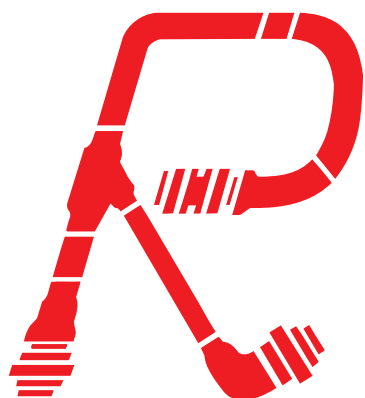




Raytech

Raytech foundry is able to produce and offer investment castings of high quality and high mechanical properties. Castings are used in sophisticated sectors, especially in aerospace industry. Investment casting offers for designers integrated parts with high quality mechanical properties, a high degree of precision and a high quality surface finishing.

EN 9100— production requirements for the aviation, defence and aerospace industries

NADCAP — for the process heat treatment in accordance with SAE Aerospace Standard AS7003

Advantages

- Production of precise castings
- Castings of high quality thanks NDT (X-Ray and penetrant testing)
- Castings with high quality surface thanks water blasting
- Consultancy, design and service during production
- Production of parts with complicated cavities
- Castings with high mechanical properties
- Heat treated castings according to NADCAP certificate

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Technical possibilities

Technology:

- Investment casting

Products:

- Production of investment castings by the technology "lost wax"
- Production of moulds
- Production of castings from customer moulds
- Production of castings from customer wax, printed SLS and other models
- Production of castings including machining, surface finishing and assembly
- Rapid Prototyping

Parameters of castings:

- Weight from 1 Gr to 8 Kg
- Min. wall thickness 1,8 mm (aluminium); 2 mm (steel)
- Max. dimensions 300 x 400 x 400 mm (aluminium); 400 x 280 x 100 mm (steel)
- Surface roughness Ra 3,2 – 6,3 (aluminium); 6,3 (steel)
- Dimension tolerance VDG P690 A2, ČSN 014470, DIN ISO 2768mK

Casting process:

- Heat treatment according to AMS 2771, pyrometry AMS 2750
- Blasting with water, stainless, corundum
- Specimens separately casted, cut from the part

Mechanical properties:

Tensile test:

- Rp0,2 (yield strength): AlSi7Mg0,3 – min. 220 Mpa
AlSi7Mg0,6 – min. 240 MPa
 - Rm (tensile strength): AlSi7Mg0,3 – min. 300 Mpa
AlSi7Mg0,6 – min. 320 MPa
 - A5 (elongation): AlSi7Mg0,3 – min. 4%
AlSi7Mg0,6 – min. 3%
(tensile test: EN ISO 6892, ASTM E8; mechanical properties: EN 1706)
- Hardness test: min. 85 HB

Surface finishing:

- **Anodize** (max. dimensions 1050 x 650 x 250 mm) – colour according to the customer (yellow-green, black, red, blue, colourless – clear, orange, bronze and gold) – ČSN EN 12373-1 or MIL-C-5541
- **Chromating** (max. dimensions 1010 x 700 x 350) – colourless – clear SurTec 650 Cr3+ ; Alodine Cr6+, E-CLPS4600, ČSN EN 12487
- **Painting** (synthetic, polyurethan, acryl and epoxid painting)

Part description:

- vibration pen, laser

Delivery dates

Moulds including samples:

8 – 12 weeks after receiving of order

Delivery (lot ca 100 pcs.):

6 – 8 weeks after receiving of order

Machinery park

- Wax press LVM 40
- Wax press SVM 2
- Carousel SVM 5
- Autoclave
- Electrical annealing furnace
- Electrical melt furnace
- Electrical furnace for heat treatment
 - solution annealing (according to Nadcap)
- Electrical furnace for heat treatment
 - artificial ageing (according to Nadcap)

Measuring and testing equipments

- Spectrometer
- Hardness machine
- Machine for specimen test Beta 5
- **Penetrant line according to ASTM-E-1417, AMS 2175, EN 571-1 (fluorescent method)**
- **X-Ray machine MU 2000 160 kV according to ASTM-E-1742, AMS 2175, ASTM-E-155 (radiography, radioscopy)**
- Developing automat GE Nova Structurix
- 3D measurement unit Wenzel



List of materials

List of Aluminium Alloys

Alloys marking			Chemist							
Chemical marking	International marking	CSN Standard	Si%	Fe%	Cu%	Mn%	Mg%	Ni%	Zn%	Ti%
AlSi7Mg0,3	A356.0	42 43 34	6,5 - 7,5	0,20	0,20	0,10	0,2 - 0,45	---	0,10	0,04 - 0,2
AlSi7Mg0,6	A357.0	42 43 34	6,5 - 7,5	0,20	0,20	0,10	0,45 - 0,70	---	0,10	0,1 - 0,2
AlSi10MgMn	DIN 239	42 43 31	9,0 - 10,5	0,50	0,05	0,1 - 0,4	0,25 - 0,45	---	0,10	0,10
AlCu4Ti	A201	---	0,15	0,15	4,2 - 5,2	0,01 - 0,5	0,10	---	0,05	0,15 - 0,30
AlCu5Ni	A203	42 43 16	0,30	0,40	4,5 - 6	0,2 - 0,4	0,50	1,2 - 1,8	---	0,1 - 0,3
AlSi11Cu2Mn	ADC 12	42 43 52	10 - 12	1,1	1,5 - 3	0,2 - 0,5	0,4	0,3	0,9	---

Alloys marking			Mechanical Features							
Chemical marking	International marking	CSN Standard	Heat treatment	MPa	Rm Mpa	Rp %	AS mm HB	Hardness 1000	E MPa code	Colour
AlSi7Mg0,3	A356.0	42 43 34	T6	---	265	195	4	75	70 - 75	white-yellow
AlSi7Mg0,6	A357.0	42 43 34	T6	---	320	270	5	80	---	white-yellow
AlSi10MgMn	DIN 239	42 43 31	T6	---	230	170	1	75	---	white-blue
AlCu4Ti	A201	---	T6	---	280 - 360	180 - 230	3 - 6	85 - 130	---	---
AlCu5Ni	A203	42 43 16	T6	---	240	---	1 - 2	85	---	---
AlSi11Cu2Mn	ADC 12	42 43 52	T6	---	210	165	1	80	---	red yellow

List of Stainless Steel Alloys

STN	W Nr.	DIN	C	Mn	Si	Cr	Ni	Mo	V	W
42 2952 M	1.4840	G-X 15 CrNi 25 20	max. 0,20	max. 1,50	0,45 1,75	24,00 27,00	20,00 22,00	max. 0,50	---	---
42 2932	1.4825	G-X 25 CrNiSi 189	0,15 0,35	max. 1,50	1,00 2,00	17,00 20,00	8,00 11,00	---	---	---
42 2936 M	1.4837	G-X 40 CrNiSi 25 12	0,30 0,45	0,50 1,50	0,75 1,75	23,00 26,00	14,00 16,00	max. 0,30	---	---
42 2952	1.4848	G-X 40 CrNiSi 25 20	0,30 0,45	0,50 1,20	0,75 1,50	24,00 27,00	20,00 22,00	max. 0,50	---	---

STN	W Nr.	DIN	C	Mn	Si	Cr	Ni	Mo	V	W
42 2931	1.4312	G-X 10 CrNi 18-8	max. 0,15	0,50 1,20	0,50 1,20	18,00 21,00	8,00 11,00	---	---	---
42 2942	1.4410	G-X 10 CrNiMo 18-9	max. 0,20	0,50 1,20	0,75 1,50	18,00 20,00	9,00 11,00	2,00 2,50	---	---
1.4308	1.4308	G-X 5 CrNi 19-10	max. 0,07	max. 1,50	max. 1,50	18,00 20,00	8,00 11,00	---	---	---
1.4408	1.4408	G-X 5 CrNiMo 19-11-2	max. 0,07	max. 1,50	max. 1,50	18,00 20,00	9,00 12,00	2,00 2,50	---	---
1.4581	1.4581	G-X 5 CrNiMoNb 19-11-3	max. 0,07	max. 1,50	max. 1,50	18,00 20,00	9,00 12,00	2,00 2,50	Nb min. 8x % C max. 1,8 %	---

STAINLESS STEEL – FERRITIC										
STN	W Nr.	DIN	C	Mn	Si	Cr	Ni	Mo	V	W
42 2905	1.4006	G-X 10 Cr 13	max. 0,15	0,30 0,70	0,30 0,70	12,00 14,00	max. 1,00	---	---	---
42 2906	1.4027	G-X 20 Cr 14	0,15 0,30	max. 0,70	max. 0,70	12,00 14,00	max. 1,00	---	---	---
42 2907	1.4028	G-X 30 Cr 13	0,30 0,40	0,40 0,90	0,30 0,70	12,00 14,00	---	---	---	---