



Elephant Dental Alloys

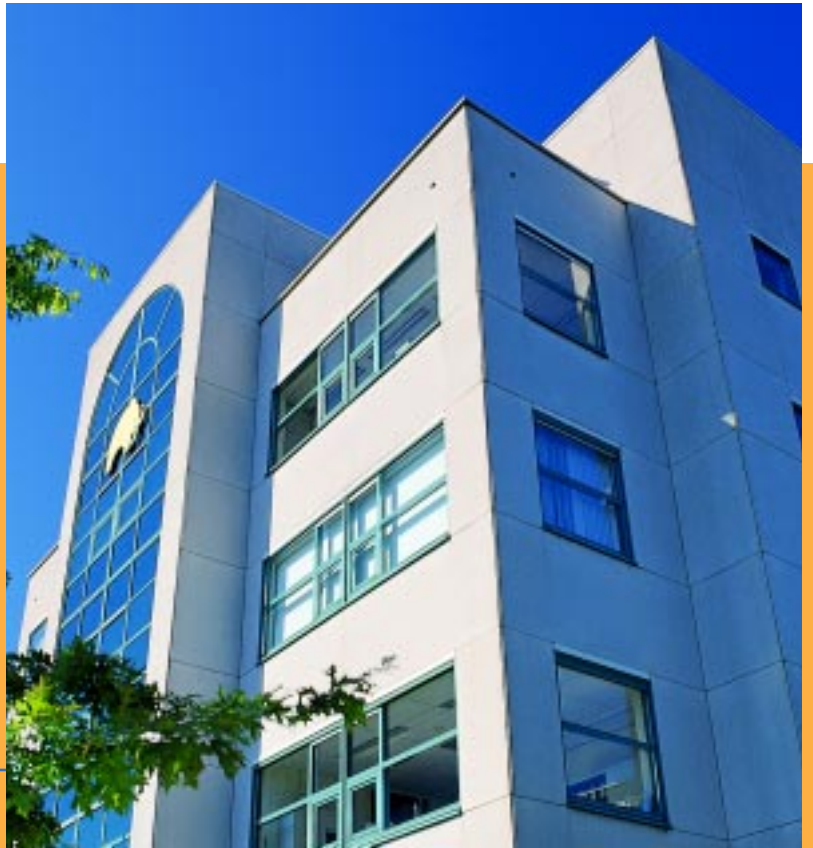
# Technical Data

Elephant



dental health products





## Quality is our number one product.

If you choose Elephant as your supplier, you choose a dental company with decades of experience in developing, manufacturing and monitoring high-quality alloys. Elephant has been an independent supplier of alloys since 1978.

In 1990, following an intensive development process, the Carrara Metal & Ceramic System (European patent no. 475.528) was launched. Combining various technologies and suitable for every application imaginable, the Carrara Metal & Ceramic System is still the best available. As supplier of this system concept, Elephant is both an inventor and a pioneer in dentistry.

Elephant's quality products are the result of extensive experience and knowledge. Their carefully aligned properties ensure:

- purity of raw materials (up to 0.0001%)
- optimal composition of alloys
- environment-friendly processing
- optimisation of the execution process, by manufacturing in accordance with the CE, ISO 9001 and ISO 13485 standards
- strict quality control

	Type	Indication	Colour	Alloy composition in weight - %											
				Au	Pt	Pd	Ag	Rh	Ir	Cu	Sn	Zn	In	Ga	Rest
<b>Carrara System</b>															
<u>Carrara PdF*/**</u>	IV	1,4,5,7,9	rich yellow	75,0	9,0	-	12,5	1,0	x	-	-	2,0	-	-	Ta
<u>Cera H*/**</u>	IV	1,4,5,7,9	yellow	73,1	1,5	5,8	16,0	-	x	-	x	2,8	x	-	
<u>Cera F*/***</u>	IV	1,4,5,7,9	yellow	58,0	3,0	7,0	27,3	-	x	-	x	2,3	x	-	Ta=1,3, Ru
<u>Cera R Plus*/***</u>	IV	1,4,5,7,9	yellow	58,0	2,0	8,0	27,9	-	x	-	-	3,0	1,0	-	
<u>Cera E*/***</u>	IV	1,4,5,7,9	white	0,1	-	39,9	51,8	-	-	-	1,0	4,0	3,0	-	Ru

#### Gold ceramic alloys\*

<u>BioGold Plus</u>	IV	5,7,9	rich yellow	86,5	10,5	-	-	x	-	-	-	1,5	x	-	Ta, Mn
<u>BioGold AN</u>	IV	5,7,9	rich yellow	86,0	11,0	-	-	x	x	-	-	1,5	x	-	Nb, Fe
<u>Bermudent Plus</u>	IV	1,4,5,7,9	rich yellow	85,0	8,8	-	2,5	1,0	x	-	-	2,2	-	-	Ta
<u>Bermudent Y</u>	III	1,4,9	rich yellow	86,0	11,0	-	-	x	-	-	-	x	1,2	-	Ta
<u>Bermudent H</u>	IV	5,7,9	light yellow	78,0	19,3	-	-	x	-	-	-	x	1,2	-	Ta
<u>Orion GX</u>	IV	5,7,9	light yellow	84,0	8,0	5,0	0,9	-	x	x	x	-	1,0	-	Re, Fe
<u>Orion UX</u>	IV	5,7,9	white	77,0	9,6	9,2	1,5	-	x	x	x	-	1,5	-	Re, Fe
<u>Orion UX Plus</u>	IV	5,7,9	white	77,1	7,7	9,5	2,0	-	x	-	-	-	3,5	-	
<u>Orion UWX</u>	IV	5,7,9	white	75,0	-	18,5	2,5	-	-	x	1,5	-	2,4	-	Re, Fe
<u>Orion WX</u>	IV	5,7,9	white	52,0	-	38,0	x	-	-	-	-	-	8,2	1,6	Re
<u>Orion E</u>	IV	5,7,9	white	52,0	-	25,6	17,0	-	x	-	x	3,0	1,6	-	Ru

#### Gold-palladium ceramic alloys\*

<u>Orion Vesta</u>	IV	5,7,9	white	2,0	-	78,9	-	-	x	10,0	-	-	-	9,0	
<u>Orion Isis Plus</u>	IV	5,7,9	white	15,0	0,2	52,0	22,5	-	-	-	6,4	1,6	2,0	-	Ru

#### Palladium-silver ceramic alloys\*

<u>Orion Argos</u>	IV	5,7,9	white	0,1	-	53,8	36,3	-	-	-	7,0	x	2,0	-	Ru
<u>Orion Virgo P</u>	IV	5,7,9	white	0,1	0,5	60,6	28,0	-	-	-	7,3	x	2,0	1,2	Ru

#### Gold-platinum casting alloys\*\*

<u>Biolife PCF</u>	IV	4,5,7	rich yellow	84,5	9,7	-	-	0,8	-	-	-	4,5	-	-	Ta
<u>Biolife 4</u>	IV	4,5,7	rich yellow	75,0	4,5	-	12,2	-	x	7,0	-	1,2	-	-	
<u>Apollo IST</u>	II	1	rich yellow	76,9	1,2	-	12,8	-	x	8,5	-	x	x	-	
<u>Apollo 3</u>	III	1,4	rich yellow	74,0	1,5	1,2	13,7	-	x	8,5	x	1,0	-	-	
<u>Apollo 3 PdF</u>	III	1,4	rich yellow	73,0	2,0	-	18,5	-	x	5,5	-	1,0	-	-	
<u>Apollo 4</u>	IV	4,5,7	rich yellow	70,0	4,5	2,0	13,4	-	x	9,0	x	1,0	-	-	
<u>Apollo 4 PdF</u>	IV	4,5,7	rich yellow	71,0	4,0	-	14,0	-	x	10,0	-	1,0	-	-	
<u>Apollo 4 CF</u>	IV	4,5,7	yellow	68,0	1,0	6,0	21,4	-	x	-	x	3,4	-	-	
<u>Apollo 4 H</u>	IV	4,5,7,11	rich yellow	66,5	8,0	1,0	14,7	-	x	9,2	x	x	-	-	

#### Casting alloys with reduced gold content\*\*\*

<u>Pluto 3</u>	III	4,5	yellow	66,0	-	4,0	19,9	-	x	9,0	x	1,0	-	-	
<u>Pluto 4</u>	IV	4,5,7	yellow	66,5	-	3,5	16,7	-	x	12,0	x	1,2	-	-	
<u>Minerva 58</u>	IV	4,5,7,11	yellow	58,0	1,0	3,5	24,4	-	x	12,0	x	1,0	-	-	
<u>Minerva 3S</u>	III	1,4	light yellow	56,0	-	7,0	27,9	-	x	8,0	x	1,0	-	-	
<u>Minerva 4 PdF</u>	IV	4,5,7	light yellow	60,0	4,5	-	25,5	-	x	9,0	-	1,0	-	-	
<u>Minerva 4 CF</u>	IV	4,5,7	light yellow	52,0	-	10,0	32,7	-	x	-	x	1,5	3,2	-	

#### Gold-palladium-silver casting alloys\*\*\*

<u>Pallacon</u>	III	4,5	white	-	-	25,0	70,0	-	x	-	x	1,5	3,4	-	
<u>Pallium 3C</u>	IV	4,5	white	10,0	-	20,0	59,9	-	x	9,0	x	1,0	-	-	
<u>Pallium 3</u>	IV	4,5	white	2,0	-	26,7	60,7	-	x	9,5	x	1,0	-	-	

\* In accordance with ISO 9693

\*\* In accordance with ISO 1562

\*\*\* In accordance with ISO 8891

X = < 1,0 %.

Type

- I Low-strength
- II Medium-strength
- III High-strength
- IV Extra-high strength

Indications

- 1. Inlays
- 4. MOD inlays; crowns; small span bridges
- 5. MOD inlays; crowns; precision milling bars and attachments
- 7. Crowns; bridges; milling bars and attachments
- 9. Crowns and bridges for porcelain-to-metal technique
- 11. Partial dentures

Reserved right to product changes.

	E-modulus GPa	Hardness HV5				0.2 Tensile limit MPa			Tensile strength MPa			Elongation %		
		c	f	h	s	c	f	h	c	f	h	c	f	h
<b>Carrara System</b>														
Carrara PdF	100	155	220	235	145	350	550	650	520	710	760	10	8	6
Cera H	105	220	270	270	155	653	720	720	760	780	780	6	5	5
Cera F	115	210	240	270	150	510	685	720	720	820	850	11	10	8
Cera R Plus	100	210	220	265	145	480	510	640	640	660	760	5	8	4
Cera E	105	220	210	260	165	530	400	560	720	590	715	7	8	5

<b>Gold ceramic alloys</b>														
BioGold Plus	91	180	220	250	-	480	550	665	600	650	750	8	8	5
BioGold AN	93	175	200	210	-	455	500	580	575	600	650	8	8	4
Bermudent Plus	92	200	220	235	-	560	620	675	680	700	760	8	7	6
Bermudent Y	89	145	170	200	-	320	430	580	470	600	660	17	15	10
Bermudent H	88	170	220	260	-	460	490	650	580	610	750	12	10	8
Orion GX	95	165	190	240	-	390	420	640	560	600	700	15	13	7
Orion UX	92	200	225	265	-	530	520	690	690	690	780	7	12	8
Orion UX Plus	100	220	235	265	-	580	600	640	760	740	770	10	7	5
Orion UWX	91	200	210	250	-	480	600	650	700	700	760	15	10	7
Orion WX	124	235	240	260	-	580	600	650	906	850	890	20	20	15
Orion E	132	260	255	320	-	650	650	780	860	840	960	11	12	6

<b>Gold-palladium ceramic alloys</b>														
Orion Vesta	123	310	310	325	-	980	880	950	1250	970	1100	15	15	12
Orion Isis Plus	110	220	250	260	-	590	520	530	900	760	780	24	20	18

<b>Palladium-silver ceramic alloys</b>														
Orion Argos	118	255	245	275	-	630	540	650	870	800	880	9	17	10
Orion Virgo P	123	235	220	260	-	540	520	560	880	800	820	25	30	25

	E-Modulus	Hardness				0.2 Tensile limit			Tensile strength			Elongation		
		c	f	h	s	c	h	s	c	h	s	c	h	s
<b>Gold-platinum casting alloys</b>														
Biolife PCF	90	195	-	230	170	470	600	350	630	705	580	7	5	12
Biolife 4	88	210	-	245	145	500	590	320	680	700	450	15	8	25
Apollo IST	92	130	-	155	125	275	290	245	465	485	450	46	40	50
Apollo 3	88	160	-	165	130	410	420	295	560	600	500	31	29	37
Apollo 3 PdF	86	155	-	155	125	350	350	250	520	540	450	31	32	38
Apollo 4	92	240	-	240	160	650	650	370	850	850	580	15	15	30
Apollo 4 PdF	92	250	-	250	185	675	675	375	800	800	580	10	10	25
Apollo 4 CF	102	250	-	250	150	630	630	350	765	700	570	6	5	15
Apollo 4 H	98	280	-	280	195	790	790	470	950	940	660	11	11	30

<b>Casting alloys with reduced gold content</b>														
Pluto 3	85	190	-	190	135	530	540	280	680	700	540	25	24	38
Pluto 4	90	275	-	275	155	700	700	335	810	810	520	15	15	35
Minerva 58	100	295	-	295	170	870	870	380	980	960	590	8	8	35
Minerva 3S	91	255	-	255	150	680	700	290	890	920	510	15	16	35
Minerva 4 PdF	95	260	-	260	160	750	750	400	870	850	600	7	4	10
Minerva 4 CF	100	205	-	225	155	540	550	340	730	680	550	6	6	15

<b>Gold-palladium-silver casting alloys</b>														
Pallacon	80	145	-	155	145	340	350	290	530	500	450	16	15	20
Pallium 3C	82	190	-	200	130	480	500	340	635	610	550	17	15	25
Pallium 3	80	190	-	200	145	500	520	390	650	650	570	15	15	30

c = as cast    f = after firing    h = hard    s = soft



#### Tensile strength

Tensile strength is measured during a tension test. A sample rod of the alloy is inserted in the measuring device and subjected to a gradually increasing tensile force. The higher the MPa value\*, the more force is needed to deform a restoration permanently. \* 1 MPa=1N/mm<sup>2</sup>

#### E-modulus

The elasticity modulus is measured during the tension test and determines the alloy's stiffness.

#### Tensile limit

The tensile limit is the value at which permanent elastic deformation will occur. The 0.2%-tensile limit is the force needed to deform the test object permanently by 0.2%.

#### Tensile strength

The tensile force that causes the test object to break.

Measuring device with sample rod

	Melting interval °C	Density g/cm <sup>3</sup>	TEC 25-500/600°C µm/m.K		Preheat temp. °C	Crucible #	Casting temp. °C elec	Oxidation °C min	Hardening °C min	Soft annealing ## °C min
<b>Carrara System</b>										
<u>Carrara PdF</u>	1000-1070	16,7	15,8	16,1	800	g/c/gc	1210	860 3	450 15 ###	850 10
<u>Cera H</u>	1000-1065	15,8	16,1	16,5	800	g/c/gc	1180	860 3	####	850 10
<u>Cera F</u>	1005-1065	13,8	16,3	16,6	800	g/c/gc	1170	860 3	450 15	800 10
<u>Cera R Plus</u>	1000-1050	13,6	16,8	17,1	800	g/c/gc	1170	860 3	450 15	850 10
<u>Cera E</u>	1085-1185	10,8	16,5	16,8	800	g/c/gc	1280	890 3	600 15	850 10

#### Gold ceramic alloys

<u>BioGold Plus</u>	1040-1130	18,6	14,3	14,5	800	g/c/gc	1280	950 3	500 15	
<u>BioGold AN</u>	1040-1140	18,7	14,3	14,6	800	g/c/gc	1235	950 3	500 15	
<u>Bermudent Plus</u>	1000-1090	18,2	14,5	14,7	800	g/c/gc	1200	900 3	860 5	
<u>Bermudent Y</u>	1050-1150	18,5	14,3	14,5	800	g/c/gc	1230	950 5	500 15	
<u>Bermudent H</u>	1120-1210	18,5	14,0	14,5	850	g/c/gc	1370	950 5	600 15	
<u>Orion GX</u>	1105-1215	18,3	14,1	14,3	800	g/c/gc	1310	950 5	500 15	
<u>Orion UX</u>	1145-1255	18,0	13,8	14,0	850	g/c/gc	1400	950 5	500 15	
<u>Orion UX Plus</u>	1150-1235	17,8	14,1	14,3	800	g/c/gc	1350	950 5	650 15	
<u>Orion UWX</u>	1190-1220	17,5	14,1	14,3	850	g/c/gc	1400	950 5	600 15	
<u>Orion WX</u>	1210-1290	13,5	13,8	14,0	900	c	1400	950 5	700 15	
<u>Orion E</u>	1170-1250	14,2	14,4	14,7	850	g/c/gc	1330	950 5	700 15	

#### Gold-palladium ceramic alloys

<u>Orion Vesta</u>	1170-1190	10,7	13,8	14,0	900	c	1400	950 5	700 15	
<u>Orion Isis Plus</u>	1200-1280	12,2	14,2	14,4	900	c	1400	950 5	700 15	

#### Palladium-silver ceramic alloys

<u>Orion Argos</u>	1200-1275	10,6	14,7	15,0	900	c	1400	950 5	700 15	
<u>Orion Virgo P</u>	1250-1300	10,5	14,5	14,7	900	c	1400	950 5	700 15	

#### Gold-platinum casting alloys

<u>Biolife PCF</u>	925-1020	18,1	-	-	750	g/c/gc	1120	-	450 15	700 10
<u>Biolife 4</u>	900-960	15,8	-	-	700	g/c/gc	1050	-	450 15	700 10
<u>Apollo IST</u>	920-960	15,7	-	-	700	g/c/gc	1030	-	550 15	700 10
<u>Apollo 3</u>	890-940	15,7	-	-	700	g/c/gc	1070	-	400 15	700 10
<u>Apollo 3 PdF</u>	890-955	15,7	-	-	700	g/c/gc	1040	-	400 15	700 10
<u>Apollo 4</u>	900-975	15,8	-	-	700	g/c/gc	1060	-	400 15	700 10
<u>Apollo 4 PdF</u>	875-925	15,6	-	-	700	g/c/gc	1020	-	400 15	700 10
<u>Apollo 4 CF</u>	1000-1070	15,7	-	-	750	g/c/gc	1150	-	400 15	700 10
<u>Apollo 4 H</u>	900-990	15,5	-	-	700	g/c/gc	1070	-	400 15	700 10

#### Casting alloys with reduced gold content

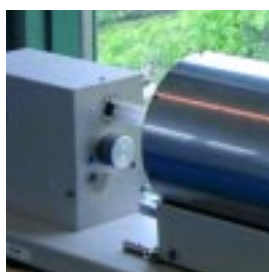
<u>Pluto 3</u>	900-950	14,6	-	-	700	g/c/gc	1040	-	350 15	800 10
<u>Pluto 4</u>	880-920	14,4	-	-	700	g/c/gc	1000	-	400 15	700 10
<u>Minerva 58</u>	850-920	13,8	-	-	750	g/c/gc	1030	-	400 15	700 10
<u>Minerva 3S</u>	935-1005	13,8	-	-	750	g/c/gc	1100	-	400 15	700 10
<u>Minerva 4 PdF</u>	870-920	13,8	-	-	750	g/c/gc	1030	-	450 15	750 10
<u>Minerva 4 CF</u>	970-1070	13,5	-	-	750	g/c/gc	1150	-	400 15	800 10

#### Gold-palladium-silver casting alloys

<u>Pallacon</u>	1020-1100	10,6	-	-	750	g/c/gc	1190	-	500 15	800 10
<u>Pallium 3C</u>	980-1040	11,0	-	-	750	g/c/gc	1130	-	500 15	800 10
<u>Pallium 3</u>	945-1035	11,0	-	-	750	g/c/gc	1120	-	500 15	800 10

#### TEC

TEC is the thermal expansion coefficient, i.e. the average expansion or shrinkage of the material under rising or falling temperatures. This is measured with a dilatometer.



Dilatometer

- # g = graphite, c = ceramic, gc = glass carbon
- ## Quench in water.
- ### Heat treatment: after firing or firing simulation.
- #### For Cera H, optimal hardening is effected by means of firing simulation.

Alloy	Laser wire Ø mm	Pre-solder	Post-solder
<b>Carrara System</b>			
<u>Carrara PdF</u>	0,4/0,6	Carrara 950° C	Carrara 750° C
<u>Cera H</u>	-	Carrara 950° C	Carrara 750° C
<u>Cera F</u>	0,4/0,6	Carrara 950° C	Carrara 750° C
<u>Cera R Plus</u>	0,4/0,6	Carrara 950° C	Carrara 750° C
<u>Cera E</u>	0,4/0,6	Carrara 950° C	Carrara 750° C

Gold ceramic alloys		Orion Solder	Elephant Solder
<u>BioGold Plus</u>	0,4/0,6	1030° C PdF yellow	II PdF 800° C, III PdF 750° C
<u>BioGold AN</u>	0,4	1030° C PdF yellow	II PdF 800° C, III PdF 750° C
<u>Bermudent Plus</u>	0,4	Carrara 950	II PdF 800° C, III PdF 750° C
<u>Bermudent Y</u>	0,4	1030° C PdF yellow	II PdF 800° C, III PdF 750° C
<u>Bermudent H</u>	0,4	1060° C yellow	II PdF 800° C, III PdF 750° C
<u>Orion GX</u>	0,4	1060° C yellow	II PdF 800° C, III PdF 750° C
<u>Orion UX</u>	0,4	1120° C white, 1060° C yellow	II PdF 800° C, III PdF 750° C
<u>Orion UX Plus</u>	0,4	1060° C PdF yellow, 1090° C white	II PdF 800° C, III PdF 750° C
<u>Orion UWX</u>	0,4	1120° C white	II PdF 800° C, III PdF 750° C
<u>Orion WX</u>	0,4/0,6	1120° C white	II PdF 800° C, III PdF 750° C
<u>Orion E</u>	0,4	1120° C white	II PdF 800° C, III PdF 750° C

Gold-palladium ceramic alloys			
<u>Orion Vesta</u>	0,4/0,6	1090° C white	PP 820° C
<u>Orion Isis Plus</u>	0,4	1090° C white	PP 820° C

Palladium-silver ceramic alloys			
<u>Orion Argos</u>	0,4	1090° C white	II PdF 800° C, III PdF 750° C
<u>Orion Virgo P</u>	0,4	1090° C white	II PdF 800° C, III PdF 750° C

Gold-platinum casting alloys		Elephant Solder
<u>Biolife PCF</u>	0,4	II PdF 800° C, III PdF 750° C
<u>Biolife 4</u>	0,4	II PdF 800° C, III PdF 750° C
<u>Apollo IST</u>	0,4	II PdF 800° C, III PdF 750° C
<u>Apollo 3</u>	0,4	II PdF 800° C, III PdF 750° C
<u>Apollo 3 PdF</u>	0,4	II PdF 800° C, III PdF 750° C
<u>Apollo 4</u>	0,4	I 850° C, II PdF 800° C, III PdF 750° C
<u>Apollo 4 PdF</u>	0,4	II PdF 800° C, III PdF 750° C
<u>Apollo 4 CF</u>	0,4	I 850° C, II PdF 800° C, III PdF 750° C
<u>Apollo 4 H</u>	0,4	II PdF 800° C, III PdF 750° C

Casting alloys with reduced gold content		
<u>Pluto 3</u>	0,4	I 850° C, II PdF 800° C, III PdF 750° C
<u>Pluto 4</u>	0,4	II PdF 800° C, III PdF 750° C
<u>Minerva 58</u>	0,4	III PdF 750° C, IV PdF 700° C
<u>Minerva 3S</u>	0,4	I 850° C, II PdF 800° C, III PdF 750° C
<u>Minerva 4 PdF</u>	0,4	II PdF 800° C, III PdF 750° C
<u>Minerva 4 CF</u>	0,4	I 850° C, II PdF 800° C, III PdF 750° C

Gold-palladium-silver casting alloys		Elephant-Pallas Solder
<u>Pallacon</u>	0,4	I 850° C, II PdF 800° C, III PdF 750° C, Pallas Lot 750° C
<u>Pallium 3C</u>	0,4	I 850° C, II PdF 800° C, III PdF 750° C, Pallas Lot 750° C
<u>Pallium 3</u>	0,4	II PdF 800° C, III PdF 750° C, Pallas Lot 750° C



Vickers hardness meter



SEM image of impression

### Hardness

'Vickers hardness' is a mechanical property that refers to pressure resistance. A pointed object is used to apply pressure on the test object. The greater the impression, the softer the material. The hardness of the alloy determines the extent to which it can be processed or polished.

## Wax conversion table

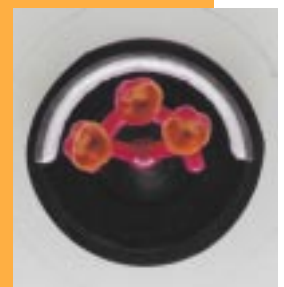
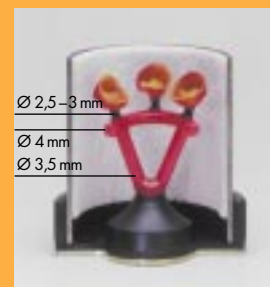
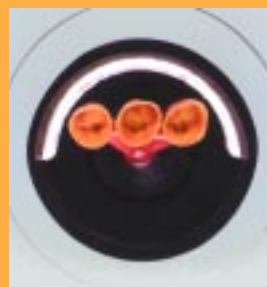
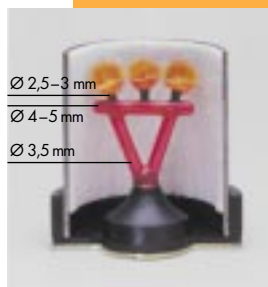
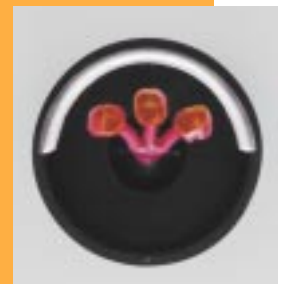
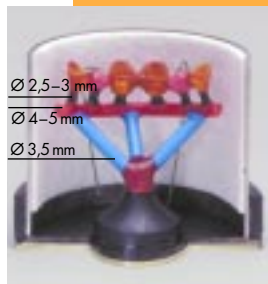
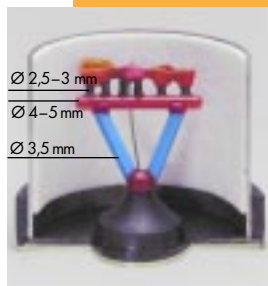
Wax weight	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6	3,8	4,0	4,2	4,4	4,6	4,8	5,0
<b>Carrara System, metal weight</b>																													
<u>Carrara PdF</u>	4	5	7	9	10	12	14	15	17	20	24	27	30	34	37	40	44	47	50	54	57	60	64	67	70	74	77	80	84
<u>Cera H</u>	4	5	7	8	10	11	13	14	16	19	22	25	29	32	35	38	41	44	48	51	54	57	60	63	67	70	73	76	79
<u>Cera F</u>	3	5	6	7	9	10	11	13	14	17	20	22	25	28	31	33	36	39	42	44	47	50	53	55	58	61	64	66	69
<u>Cera R Plus</u>	3	5	6	7	9	10	11	12	14	17	19	22	25	27	30	33	36	38	41	44	46	49	52	55	57	60	63	65	68
<u>Cera E</u>	3	4	5	6	7	8	9	10	11	13	15	17	20	22	24	26	28	30	33	35	37	39	41	43	46	48	50	52	54
Wax weight	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6	3,8	4,0	4,2	4,4	4,6	4,8	5,0
<b>Gold ceramic alloys, metal weight</b>																													
<u>BioGold Plus</u>	4	6	8	10	12	13	15	17	19	23	26	30	34	37	41	45	49	52	56	60	63	67	71	75	78	82	86	89	93
<u>BioGold AN</u>	4	6	8	10	12	13	15	17	19	23	26	30	34	38	41	45	49	53	56	60	64	67	71	75	79	82	86	90	94
<u>Bermudent Plus</u>	4	6	8	10	11	13	15	17	18	22	26	29	33	37	40	44	47	51	55	58	62	66	69	73	77	80	84	88	91
<u>Bermudent Y</u>	4	6	8	10	12	13	15	17	19	22	26	30	33	37	41	45	48	52	56	59	63	67	70	74	78	82	85	89	93
<u>Bermudent H</u>	4	6	8	10	12	13	15	17	19	22	26	30	33	37	41	45	48	52	56	59	63	67	70	74	78	82	85	89	93
<u>Orion GX</u>	4	6	8	10	11	13	15	17	18	22	26	29	33	37	40	44	48	51	55	59	62	66	70	73	77	81	84	88	92
<u>Orion UX</u>	4	6	8	9	11	13	15	16	18	22	25	29	33	36	40	43	47	51	54	58	61	65	69	72	76	79	83	87	90
<u>Orion UX Plus</u>	4	6	8	9	11	13	14	16	18	22	25	29	32	36	39	43	46	50	54	57	61	64	68	71	75	78	82	86	89
<u>Orion UWX</u>	4	6	7	9	11	13	14	16	18	21	25	28	32	35	39	42	46	49	53	56	60	63	67	70	74	77	81	84	88
<u>Orion WX</u>	3	5	6	7	9	10	11	12	14	16	19	22	24	27	30	33	35	38	41	43	46	49	51	54	57	60	62	65	68
<u>Orion E</u>	3	5	6	8	9	10	12	13	14	17	20	23	26	29	31	34	37	40	43	46	48	51	54	57	60	63	65	68	71
Wax weight	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6	3,8	4,0	4,2	4,4	4,6	4,8	5,0
<b>Gold-palladium ceramic alloys, metal weight</b>																													
<u>Orion Vesta</u>	3	4	5	6	7	8	9	10	11	13	15	17	19	22	24	26	28	30	32	34	37	39	41	43	45	47	49	52	54
<u>Orion Isis Plus</u>	3	4	5	7	8	9	10	11	12	15	17	20	22	25	27	30	32	34	37	39	42	44	47	49	51	54	56	59	61
Wax weight	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6	3,8	4,0	4,2	4,4	4,6	4,8	5,0
<b>Palladium-silver ceramic alloys, metal weight</b>																													
<u>Orion Argos</u>	3	4	5	6	7	8	9	10	11	13	15	17	19	21	23	26	28	30	32	34	36	38	40	43	45	47	49	51	53
<u>Orion Virgo P</u>	3	4	5	6	7	8	9	10	11	13	15	17	19	21	23	25	27	30	32	34	36	38	40	42	44	46	48	51	53
Wax weight	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6	3,8	4,0	4,2	4,4	4,6	4,8	5,0
<b>Gold-platinum ceramic alloys, metal weight</b>																													
<u>Biolife PCF</u>	4	6	8	10	11	13	15	16	18	22	26	29	33	36	40	44	47	51	54	58	62	65	69	73	76	80	83	87	91
<u>Biolife 4</u>	4	5	7	8	10	11	13	14	16	19	22	25	29	32	35	38	41	44	48	51	54	57	60	63	67	70	73	76	79
<u>Apollo IST</u>	4	5	7	8	10	11	13	14	16	19	22	25	28	32	35	38	41	44	47	50	54	57	60	63	66	69	72	76	79
<u>Apollo 3</u>	4	5	7	8	10	11	13	14	16	19	22	25	28	32	35	38	41	44	47	50	54	57	60	63	66	69	72	76	79
<u>Apollo 3 PdF</u>	4	5	7	8	10	11	13	14	16	19	22	25	28	32	35	38	41	44	47	50	54	57	60	63	66	69	72	76	79
<u>Apollo 4</u>	4	5	7	8	10	11	13	14	16	19	22	25	29	32	35	38	41	44	48	51	54	57	60	63	67	70	73	76	79
<u>Apollo 4 PdF</u>	4	5	7	8	10	11	13	14	16	19	22	25	28	31	34	38	41	44	47	50	53	56	59	63	66	69	72	75	78
<u>Apollo 4 CF</u>	4	5	7	8	10	11	13	14	16	19	22	25	28	32	35	38	41	44	47	50	54	57	60	63	66	69	72	76	79
<u>Apollo 4 H</u>	4	5	7	8	10	11	13	14	16	19	22	25	28	31	34	37	40	44	47	50	53	56	59	62	65	68	71	75	78
Wax weight	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6	3,8	4,0	4,2	4,4	4,6	4,8	5,0
<b>Casting alloys with reduced gold content, metal weight</b>																													
<u>Pluto 3</u>	3	5	6	8	9	11	12	13	15	18	21	24	26	30	32	35	38	41	44	47	50	53	56	59	61	64	67	70	73
<u>Pluto 4</u>	3	5	6	8	9	10	12	13	15	17	20	23	26	29	32	35	38	40	43	46	49	52	55	58	61	64	66	69	72
<u>Minerva 58</u>	3	5	6	7	9	10	11	13	14	17	20	22	25	28	31	33	36	39	42	44	47	50	53	55	58	61	64	66	69
<u>Minerva 3S</u>	3	5	6	7	9	10	11	13	14	17	20	22	25	28	31	33	36	39	42	44	47	50	53	55	58	61	64	66	69
<u>Minerva 4 PdF</u>	3	5	6	7	9	10	11	13	14	17	20	22	25	28	31	33	36	39	42	44	47	50	53	55	58	61	64	66	69
<u>Minerva 4 CF</u>	3	5	6	7	9	10	11	12	14	16	19	22	24	27	30	33	35	38	41	43	46	49	51	54	57	60	62	65	68
Wax weight	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6	3,8	4,0	4,2	4,4	4,6	4,8	5,0
<b>Gold-palladium-silver casting alloys, metal weight</b>																													
<u>Pallacon</u>	3	4	5	6	7	8	9	10	11	13	15	17	20	21	23	26	28	30	32	40	36	38	40	43	45	47	49	51	53
<u>Pallium 3C</u>	3	4	5	6	7	8	9	10	11	13	16	18	20	22	24	27	29	31	33	35	38	40	42	44	46	49	51	53	55
<u>Pallium 3</u>	3	4	5	6	7	8	9	10	11	13	16	18	20	22	24	27	29	31	33	35	38	40	42	44	46	49	51	53	55

Waxweight including casting ducts but without casting cone.

Add 6 to 10g for the casting device.

(6g for palladium alloys, 10g for alloys with a high gold content)

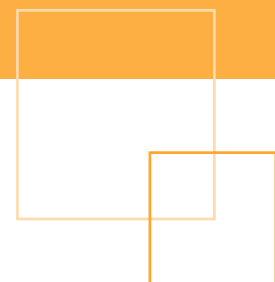
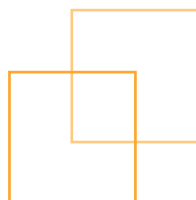
## Recommended positioning of casting ducts.



### Recommended positioning of casting ducts for the **centrifugal casting process**

### Recommended positioning of casting ducts for the **vacuum casting technique**

Proper positioning of casting ducts is a precondition for optimal casting results. Depending on the casting technique used, the indirect lost-wax method is usually preferred. We recommend using a casting bar with a diameter of 4 or 5 mm. The supply duct to the casting bar should have a diameter of 3.5 mm. The supply duct to and from the casting bar and the object should have a diameter of 2.5 to 3 mm. If the casting ducts are attached to the object, the casting posts should have a diameter of 3 to 3.5 mm. The objects must be positioned in the upper third part of the muffle's element and as close to the muffle wall as possible. This is the only way to ensure that they are positioned outside of the muffle's thermal centre (see images) and that the metal solidifies optimally. For larger objects, we recommend using vents ( $\varnothing$  0.8 - 1 mm), which enable air to escape more easily and the object to cool and solidify more rapidly. If using the centrifugal casting technique, these vents should connect the object to the bottom of the casting funnel. If using the vacuum casting technique, the vents serve primarily as cooling ducts and should not lead to the bottom.



## Flame position.



### Too much gas

The flame is too yellow. It contains too much gas and too little oxygen. Carbon compounds may form in the alloy.



### Optimal position

The flame contains the proper amount of gas and oxygen to fuse the alloys.

## Alloy fusion.



### Too much oxygen

The flame is bright blue. It contains too much oxygen. Oxidation may occur at high temperatures.

## Solders, wires and foils

	Type	Indication	Colour	Solder composition in weight - %											
				Au	Pt	Pd	Ag	Rh	Ir	Cu	Sn	Zn	In	Ga	Rest
<b>Pre-solder</b>															
Carrara solder 950°C	IV	12	yellow	60,0	0,5	-	36,6	-	x	-	0,8	2,0	-	-	
Orion solder 1030°C PdF yellow	III	12	yellow	61,0	1,3	-	36,7	-	x	-	x	-	x	-	
Orion solder 1060°C yellow	III	12	yellow	79,8	-	3,0	15,5	-	x	-	1,0	x	x	-	
Orion solder 1090°C white	IV	12	white	66,7	-	12,5	17,5	-	x	x	x	2,6	x	-	Re
Orion solder 1120°C white	IV	12	white	70,0	-	10,0	17,4	-	x	x	1,0	1,0	-	-	Re,Fe
GNP solder 930°C	IV	14	white	79,9	-	0,1	-	-	x	x	x	5,0	-	-	Ni=14,3
<b>Post-solder</b>															
Carrara solder 750°C	IV	13	yellow	60,0	0,2	-	27,2	-	x	-	x	12,0	-	-	
Elephant solder I 850°C	IV	13	yellow	70,6	-	4,0	5,0	-	x	13,0	x	2,0	5,2	-	
Elephant solder II PdF 800°C	IV	13	yellow	70,0	1,5	-	7,9	-	x	13,0	-	2,4	5,2	-	
Elephant solder III PdF 750°C	IV	13	yellow	63,4	0,2	-	13,1	-	x	13,1	-	5,0	5,2	-	
Elephant solder IV PdF 700°C	IV	13	yellow	50,0	0,2	-	31,0	-	x	3,0	0,2	9,0	6,5	-	
GNP solder 800°C	IV	14	yellow	45,0	-	2,2	28,2	-	x	13,2	x	2,1	7,0	-	Mn=2,0
Pallas solder III 750°C	IV	13	white	10,2	-	0,1	68,4	-	x	11,1	1,9	3,0	5,3	-	
PP solder 820°C	IV	13	yellow	50,0	-	-	25,0	-	-	25,0	-	-	-	-	

When soldering in a ceramic furnace, the temperature has to be increased by 40 to 50°C.

## Wires

Pernox	IV	8	white	61,5	20,1	17,5	0,5	-	x	x	-	x	-	-	Fe
Apollo D	IV	6,10	rich yellow	61,3	12,8	0,2	16,3	-	x	9,1	x	x	-	-	
Apollo R	I	2	rich yellow	61,5	12,8	0,3	24,9	-	x	-	x	-	x	-	
Laser wire		16	Several alloys												

## Foils

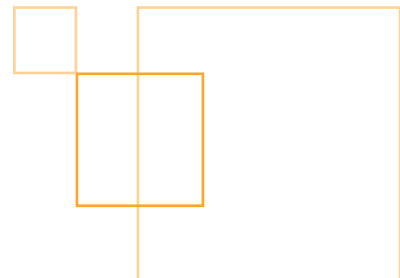
Platin	I	15	white	-	100,0	-	-	-	-	-	-	-	-	-	-
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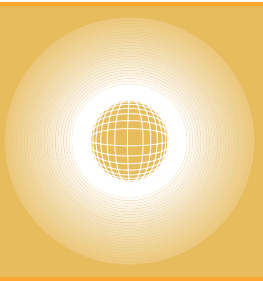
## Indications

2. Retention wires
6. Claps wire
8. Cast-to-root pins
10. Orthodontic appliances (Crozat)
12. Before ceramic firing and repairs
13. After ceramic firing and for repairs
14. Soldering of Co-Cr
15. Jacket crown technique
16. For laser-welding

## Delivery forms

- Brand-solder 0.25 x 1.0 mm
- Wire-solder 180 x 0.8 mm round
- Wire round and halfround
- Laserwire round, diameter 0.4 mm and 0.6 mm
- Foil Platinum 100 x 33 mm, thickness 0.025 mm
- Platinum 100 x 50 mm, thickness 0.020 mm





## The investment.

### Universal investment for maximum efficiency.

A single universal phosphate-based investment for every application, for use in combination with both casting techniques and press ceramics. With Carrara Universal DL investment, you will always obtain optimal smooth results.

### Ready to use for every application.

A range of four pre-packaged units (i.e. 60-g, 100-g and 150-g sachets, or 6-kg boxes) suffice for all conceivable applications. Bulk consumers can order 6-kg buckets.



### Commercial advantage of Carrara Universal DL.

Use a single investment to achieve cost savings and reduce your storage costs.

Conventional investment/  
Carrara Universal DL



Less dust



MAC value	Carrara Universal DL	Conventional investment
0,0750 mg/m <sup>3</sup>	0,0278 mg/m <sup>3</sup>	0,3560 mg/m <sup>3</sup>
<p>Concentrations exceeding the MAC value increase the risk of silicosis and lung cancer. The MAC value has been lowered to 0.075 mg/m<sup>3</sup> (the Netherlands, 1999).</p>		

### Thirteen times less dust: health advantages.

Carrara Universal DL is just as easy to use as conventional investments, but offers a great advantage, i.e. its use results in the development of thirteen times less dust. As such, it is one third below the DIN standard of the Maximum Acceptable Concentration (MAC) value.

Fewer health risks and heightened workplace safety – better for your health.

### We support your success.

# Elephant



dental health products

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