

Heraeus

dental
alloys

Table of Technical Data
Edition 02/2011

Hera

For good Reasons.



CE 0197		Type ^D	Colour	Applications	Content in mass %											
					Au	Ag	Pt	Pd	Cu	Sn	Zn	In	Ta	Ir	Ru	Others
Ceramic Bonding Alloys acc. to EN ISO 9693 and 22674																
Implant	Bio SupraCeram	4 ^{SVk}		3,4,5,15	79,0	–	18,3	–	–	–	2,0	–	0,3	0,4	–	x Ce
	BioCeram Plus	4 ^{SVk}		3,4,5,15 ^(A)	90,0	–	7,9	–	–	1,5	–	–	x	–	–	0,1 Fe, 0,1 Mn, 0,2 Rh, 0,1 Nb, x Ce
	Bio Herador SG	4 ^{SVk}		3,4,5,15 ^(A)	88,7	–	9,49	–	–	1,5	–	–	x	–	–	0,1 Mn, 0,2 Rh
	Bio Herador CN	4 ^{SVk}		3,4,5,15 ^(A)	86,6	–	10,4	–	–	1,5	0,2	0,2	0,1	–	–	0,1 Mn, 0,9 Rh
	Bio Herador N	4 ^{SVk}		3,4,5,15 ^(A)	86,2	–	11,5	–	–	1,5	–	0,3	–	0,4	–	0,1 Mn
	Bio Herador GG	4 ^{SVk}		3,4	86,7	–	11,2	–	–	–	1,7	–	0,1	–	–	0,3 Fe
	Bio Herador MP	4 ^{SVk}		3,4,5,15 ^(A)	85,9	–	11,7	–	–	1,5	x	–	x	–	–	0,1 Mn, 0,15 Rh, 0,5 Nb, x Fe
	Herador EC	4 ^{SVk}		3,4,5 ^(A)	75,0	8,0	14,3	–	–	2,5	–	0,2	–	–	–	–
	Herador MP	4 ^{SVk}		3,4,5,15 ^(A)	85,9	–	11,7	–	–	1,5	x	–	x	–	–	0,1 Mn, 0,15 Rh, 0,5 Nb, x Fe
	Herador PF	4 ^{SVk}		3,4,5,15 ^(A)	77,7	–	19,5	–	–	2,0	–	0,3	0,5	–	–	–
	Herador C	4 ^{SVk}		3,4,5	86,6	–	10,8	–	–	–	1,7	0,3	–	–	–	0,6 Rh
	Herador S	4 ^{SVk}		3,4,5,15	84,2	–	7,7	5,3	–	–	2,4	–	x	x	–	0,3 Fe
	Herador G	4 ^{SVk}		3,4	82,8	–	16,0	–	–	–	1,0	–	0,2	–	–	–
	Herador GG	4 ^{SVk}		3,4	86,7	–	11,0	–	0,2	–	–	1,7	–	0,1	–	0,3 Fe
Herador H	4 ^{SVk}		3,4,5,15	78,5	–	10,0	7,8	–	–	–	3,5	–	0,2	–	–	
Herador NH	4 ^{SVk}		3,4,5,15	77,8	1,3	9,5	9,0	0,3	0,6	–	1,2	–	x	x	0,2 Fe	
reduced gold	Heraloy G	4 ^{SVk}		3,4,5,15	51,5	–	–	37,9	–	–	–	8,5	–	x	x	2,0 Ga
	Herabond	4 ^{SVk}		3,4,5,15	51,5	18,0	–	26,6	0,2	2,7	–	0,9	–	x	x	–
	Herabond N	4 ^{SVk}		3,4,5,15	39,0	19,4	1,0	35,0	–	5,0	–	0,5	–	x	x	–
Pd-based	Albabond A	4 ^{SVk}		3,4,5,15	–	32,6	–	56,6	–	6,8	0,2	3,4	–	0,2	0,2	–
	Albabond B	4 ^{SVk}		3,4,5,15	5,3	6,5	–	74,4	–	8,0	–	1,0	–	–	0,3	4,5 Ga
	Heralight	4 ^{SVk}		3,4,5,15	–	27,8	–	60,1	–	3,0	0,2	7,0	–	0,2	0,2	1,5 Ga

Universal Alloys, Ceramic Bonding Alloys acc. to EN ISO 22674 and 9693

Hera	HeranormSun	4 ^{SVk}	3 ^{SVk}	1,2,3,4,5,14	71,0	17,3	8,5	–	–	–	2,4	–	0,3	–	–	0,5 Rh
	MainbondSun	4 ^{SVk}		1,2,3,4,5,10,14,15	74,0	14,5	1,5	5,5	–	–	3,3	1,0	0,1	0,1	–	–
	AureaSun	4 ^{SVk}		1,2,3,4,5,10,14,15 ^(A)	55,0	23,0	12,5	2,5	–	–	4,5	2,0	0,1	–	0,4	–
	AlbaSun	4 ^{SVk}	3 ^{SVk}	1,2,3,4,5,10,14	2,0	58,0	–	32,9	–	2,0	3,5	1,5	–	x	x	–
universal	Bio Heranorm	4 ^{SVk}	3 ^{SVk}	1,2,3,4,14	72,5	16,3	8,5	–	–	0,5	2,0	–	0,2	–	–	–
	Mainbond EH	4 ^{SVk}		1,2,3,4,5 ^(B) , 6,14,15 ^(A)	70,0	13,4	8,5	–	7,5	–	0,5	–	–	0,1	–	–
	Mainbond A	4 ^{SVk}		1,2,3,4,5 ^(B) , 14,15 ^(A)	74,1	9,0	8,9	–	4,4	–	2,0	1,5	–	0,1	–	–
	Keramikgold PKF	4 ^{SVk}	3 ^{SVk}	1,2,3,4,5 ^(C) , 14,15 ^(A)	75,0	12,5	9,0	–	–	–	2,0	–	0,45	x	–	1,0 Rh
	Keramikgold N	4 ^{SVk}	3 ^{SVk}	1,2,3,4,14,15 ^(A)	72,9	14,5	8,9	–	–	–	1,5	1,5	0,2	0,1	–	0,4 Rh
	Hera KF	4 ^{SVk}	3 ^{SVk}	1,2,3,4,5,10,14,15 ^(A)	55,0	30,5	–	9,9	–	–	2,0	2,5	–	x	x	–
	Hera Ecobond	4 ^{SVk}		1,2,3,4,5,14	36,7	36,7	–	16,5	–	–	–	10,0	–	0,1	–	–
	Heradent	4 ^{SVk}	3 ^{SVk}	1,2,3,4,5 ^(B) , 10,14	–	53,0	–	39,9	–	1,5	3,5	2,0	–	x	x	–
	Herabest	4 ^{SVk}		1,2,3,4,5,10,14,15 ^(A)	57,0	27,0	–	10,0	–	0,55	1,4	4,0	–	x	–	–
Herastar	4 ^{SVk}		1,2,3,4,5,14	40,0	35,9	–	15,0	–	–	–	9,0	–	0,1	–	–	

High Gold Content Casting Alloys acc. to EN ISO 22674

high gold content	Bio Maingold SG	4 ^{SVk}		1,2,3,4,5 ^(B) , 10,15	71,0	12,3	3,9	–	12,2	–	0,5	–	–	0,1	–	–
	Maingold SG	4 ^{SVk}		1,2,3,4,5 ^(B) , 10,15	71,0	12,3	2,0	1,9	12,2	–	0,5	–	–	x	x	–
	Maingold MP	4 ^{SVk}	3 ^{SVk}	1,2,3,4,5 ^(B) , 10,15 ^(A)	72,0	13,7	3,6	–	9,8	–	0,8	–	–	0,1	–	–
	Maingold Premium	4 ^{SVk}		4,5,6	70,0	13,5	4,4	2,0	8,8	–	1,2	–	–	0,1	–	–
	Maingold OG	4 ^{SVk}		4,5 ^(B) , 6,10,15	70,0	13,4	7,5	0,95	7,6	–	0,5	–	–	x	x	–
	Bio Maingold TK	4 ^{SVk}	2 ^{SVk}	1,2,3,4,5 ^(C) , 15 ^(A) , 16 ^(C)	84,5	–	10,1	–	–	–	4,5	–	0,5	–	0,4	–
	Bio Maingold IT	3 ^{SVk}	2 ^{SVk}	1,2	77,0	13,0	1,0	–	8,5	–	0,2	0,2	–	0,1	–	–
	Bio Maingold I	3 ^{SVk}	1 ^{SVk}	1	91,7	2,8	3,45	–	–	–	2,0	–	–	x	–	–

Reduced Precious Metal Casting Alloys acc. to EN ISO 22674


reduced gold	Hera SG	4 ^{SVk}		1,2,3,4,5 ^(B) , 6,10,15	55,6	24,4	1,0	3,7	14,0	–	1,0	0,2	–	x	x	–
	Hera GG	4 ^{SVk}	3 ^{SVk}	1,2,3,4,5 ^(B) , 6,10,15	59,3	22,9	0,6	3,7	13,0	–	0,4	–	–	x	x	–
	Hera PF	4 ^{SVk}		1,2,3,4,5 ^(B) , 6,10,15	59,3	22,9	4,3	–	13,0	–	0,4	–	–	0,1	–	–

Non Precious Alloys

non precious ceramic bonding alloys	Ceramic Bonding Alloys (CoCr) acc. to EN ISO 9693 and 22674				Co	Ni	Cr	Mo	Mn	Si	C	N	Ta	Fe	Nb	W	Others
	Heraenium P	5 ^{SVk}		3,4,5,6	59,0	–	25,0	4,0	0,8	1,0	–	0,2	–	–	–	10,0	–
	Heraenium Pw	5 ^{SVk}	4 ^{SVk}	3,4,5,6	55,2	–	24,0	–	0,8	1,0	–	x	–	4,0	–	15,0	–
	Ceramic Bonding Alloys (NiCr) acc. to EN ISO 9693 and 22674				Co	Ni	Cr	Mo	Mn	Si	C	N	Ta	Fe	Nb	W	Others
	Heraenium NA	4 ^{SVk}		3,4,5	–	59,3	24,0	10,0	1,5	1,2	–	–	1,5	1,5	1,0	–	–
	Heraenium S	3 ^{SVk}		3,4,5	–	62,9	23,0	10,0	–	2,0	–	–	–	1,5	–	–	0,6 Ce
partial denture alloys	Universal Bonding Alloy (CoCr) acc. to EN ISO 22674 and 9693				Co	Ni	Cr	Mo	Mn	Si	C	N	Ta	Fe	Nb	W	Others
	HeraeniumSun	4 ^{SVk}		3,4,5,6,14,15	43,0	–	23,45	2,0	0,8	1,0	0,1	0,15	–	27,0	–	2,5	–
	Partial Denture Alloys (CoCr) acc. to EN ISO 22674				Co	Ni	Cr	Mo	Mn	Si	C	N	Ta	Fe	Nb	W	Others
	Heraenium CE	5 ^{SVk}		6	63,5	–	27,8	6,6	0,6	1,0	0,3	0,2	–	–	–	–	–
Heraenium EH	5 ^{SVk}		6	63,5	–	28,0	6,5	0,6	1,0	0,15	0,25	–	–	–	–	–	
Heraenium Laser	5 ^{SVk}		6	63,5	–	28,0	6,5	0,6	1,05	x	0,3	–	–	–	–	–	

*Notes: See legend chemical composition

Page 2: Technical Data, Melting and Casting


		Melting range ¹⁾		Preheating Temperature	Casting Temperature	Crucible	Density ¹⁾ g/cm ³	Hardness			0,2% Yield strength ¹⁾		Elongation ¹⁾		Young's modul ¹⁾ GPa ²⁾	
		Solidus	Liquidus					HV5			MPa ²⁾		%			
		°C	°C	°C	°C			w/k	v	s	w/k	v	w/k	v		
Implant	Bio Supra Ceram	1080	1175	900	1325	G	19,1	235	260	225	600	630	4	3	93	
	Bio Ceram Plus	1040	1100	850	1250	G	19,0	220	220 ³⁾	180	520	520 ³⁾	3	3 ³⁾	90	
	Bio Herador SG	1055	1130	850	1280	G	19,0	215	220	180	520	540	6	5	90	
	Bio Herador CN	1055	1140	850	1290	G	18,6	215	230	190	560	645	4	3	94	
	Bio Herador N	1050	1130	850	1280	G	19,0	205	220	185	500	555	6	5	90	
	Bio Herador GG	1010	1110	900	1260	G	19,2	160	170	125	330	460	13	7	90	
	Bio Herador MP	1060	1140	800	1290	G	18,9	220	210 ³⁾	190	580	560 ³⁾	6	6 ³⁾	94	
	Herador EC	1015	1110	800	1260	G	17,8	195	220	155	440	490	9	7	100	
	Herador MP	1060	1140	800	1290	G	18,9	220	210 ³⁾	190	580	560 ³⁾	6	6 ³⁾	94	
	Herador PF	1050	1160	900	1310	G	19,1	225	255	195	600	640	4	3	100	
	Herador C	1060	1135	850	1285	G	19,1	160	200	125	395	480	15	11	89	
	Herador S	1080	1150	900	1300	G	18,3	235	260	200	610	650	10	5	101	
	Herador G	1130	1200	900	1350	G	19,4	150	190	120	370	480	11	9	95	
	Herador GG	1020	1125	900	1275	G	19,2	150	170	125	330	460	13	7	90	
	Herador H	1150	1200	900 – 950 ⁴⁾	1350	G	17,6	220	270	200	600	710	8	5	118	
Herador NH	1160	1260	900 – 950 ⁴⁾	1410	G	17,7	205	255	185	540	650	9	7	109		
reduced gold	Heraloy G	1130	1280	900	1430	K	14,5	250	260	210	550	600	23	14	132	
	Herabond	1190	1230	900	1380	G	14,3	220	260	200	520	600	12	8	134	
	Herabond N	1200	1250	900	1400	K	13,2	235	270	215	620	690	7	4	145	
Pd-based	Albabond B	1120	1300	900	1450	K	11,7	225	240	225	460	470	41	40	128	
	Albabond A	1165	1285	900	1440	K	11,4	205	235	220	460	540	26	18	122	
	Heralight	1225	1280	900	1430	K	11,2	255	290	290	555	620	25	20	148	
 Hera Sun	HeranormSun	1005	1040	800	1170	G	16,3	150/170	185	140	385	450	11	6	95	
	MainbondSun	950	1030	750	1160	G	15,7	160/250	240 ³⁾	235	700	660 ³⁾	4	4 ³⁾	100	
	AureaSun	960	1045	750	1175	G	14,7	150/205	230	190	470	490	5	4	110	
	AlbaSun	1045	1105	800	1235	G	10,8	150/175	210	170	310	450	11	5	108	
universal	Bio Heranorm	970	1035	750	1170	G	16,5	125/160	190	130	400	420	12	7	90	
	Mainbond EH	895	1010	700	1140	G	16,0	170/260	295	280	530	600	18	21	100	
	Mainbond A	890	990	700	1120	G	16,7	150/190	230	180	440	500	9	6	96	
	Keramikgold PKF	990	1050	800	1180	G	16,7	180/205	220	135	455	450	6	7	95	
	Keramikgold N	980	1045	750	1180	G	16,6	150/190	200	145	470	480	8	7	97	
	Hera KF	985	1070	850	1200	G	14,1	155/170	255	205	300	640	20	6	93	
	Hera Ecobond	970	1040	750	1190	G	12,7	165/220	240	205	540	575	4	3	98	
	Heradent	1070	1165	850	1295	G	11,0	170/180	250	200	320	535	15	5	100	
	Herabest	960	1060	800	1210	G	13,9	155/210	235	200	480	575	6	3	97	
	Herastar	965	1050	800	1200	G	13,0	170/220	–	210	550	–	5	–	107	
high gold content	Bio Maingold SG	875	920	700	1050	G	15,4	160	250	250	380	630	42	16	99	
	Maingold SG	900	930	700	1060	G	15,4	160	250	230	380	670	45	20	99	
	Maingold MP	905	960	700	1090	G	15,6	150	225	220	320	550	40	14	95	
	Maingold Premium	900	970	700	1100	G	15,7	170	235	235	400	620	30	17	99	
	Maingold OG	930	990	700	1120	G	15,7	180	295	245	380	730	37	13	102	
	Bio Maingold TK	940	990	700	1120	G	18,1	140	210	170	260	540	13	6	83	
	Bio Maingold IT	890	930	700	1060	G	15,8	120	165	130	225	290	50	40	91	
	Bio Maingold I	935	1035	700	1160	G	18,5	70	140	140	115	295	34	16	85	
	reduced gold	Hera SG	840	895	700	1000	G	13,7	195	280	280	530	860	25	5	100
Hera GG		870	920	700	1050	G	14,1	160	265	265	340	780	38	6	103	
Hera PF		820	890	700	1030	G	14,2	170	280	260	440	760	35	7	93	
non-precious ceramic bonding alloys	Ceramic Bonding Alloys (CoCr) acc. to EN ISO 9693 and 22674															
	Heraenium P	1305	1400	950 – 1000	1550	Ceramic NPM	8,8	330 HV10	–	320 HV10	650	–	8	–	200	
	Heraenium Pw	1320	1400	950	1550	Ceramic NPM	8,2	290 HV10	–	275 HV10	530	–	8	–	208	
	Ceramic Bonding Alloys (NiCr) acc. to EN ISO 9693 and 22674															
	Heraenium NA	1190	1300	850	1450	Ceramic NPM	8,3	200 HV 10	–	190 HV 10	360	–	30	–	222	
	Heraenium S	1200	1350	850 – 900	1500	Ceramic NPM	8,2	200 HV 10	–	180 HV 10	335	–	23	–	224	
Universal Bonding Alloy (CoCr) acc. to EN ISO 22674 and 9693																
Heraenium Sun	1290	1380	950	1500	Ceramic NPM	8,2	280 HV 10	–	265 HV 10	490	–	18	–	250		
partial denture alloys	Partial Denture Alloys (CoCr) acc. to EN ISO 22674															
	Heraenium CE	1330	1380	950 – 1050	1530	Ceramic NPM	8,0	–	–	380 HV 10	–	580	–	4	228	
	Heraenium EH	1330	1380	950 – 1050	1530	Ceramic NPM	8,0	–	–	310 HV 10	–	620	–	7	228	
	Heraenium Laser	1330	1380	1000	1530	Ceramic NPM	8,0	–	–	340 HV 10	–	610	–	12	220	

*Notes: See legend Technical Data, melting and casting

Page 3: Ceramic Firing

		Coeff. of thermal expansion (CTE)			Processing		Cooling		Hardening		
		25 – 500 °C ⁽¹⁾									Oxide Firing
		µm/m*K			°C / min	vacuum	°C / min	after oxide firing	after ceramic firing*	°C	min
		HeraCeram					HeraCeram	Others			
Implant	Bio Supra Ceram	13,7	880 ⁽¹⁾ /10	✓	–	☒	S	S ⁽³⁾	450	10	
	Bio Ceram Plus	14,7	880 ⁽¹⁾ /10	✓	–	☒	S	L ⁽³⁾	– ⁽⁵⁾	– ⁽⁵⁾	
	Bio Herador SG	14,5	880 ⁽¹⁾ /10	✓	–	☒	S	L ⁽³⁾	450	15	
	Bio Herador CN	14,5	880 ⁽¹⁾ /10	✓	–	☒	S	L ⁽³⁾	450	15	
	Bio Herador N	14,3	880 ⁽¹⁾ /10	✓	–	☒	S	L ⁽³⁾	450	15	
	Bio Herador GG	14,5	880 ⁽¹⁾ /10	✓	–	☑	S	L ⁽³⁾	500	15	
	Bio Herador MP	14,3	880 ⁽¹⁾ /5	–	–	☒	S	L ⁽³⁾	450 ⁽⁵⁾	20 ⁽⁵⁾	
	Herador EC	14,8	880 ⁽¹⁾ /10	✓	–	☒	S	L ⁽³⁾	500	15	
	Herador MP	14,3	880 ⁽¹⁾ /5	–	–	☒	S	L ⁽³⁾	450 ⁽⁵⁾	20 ⁽⁵⁾	
	Herador PF	13,7	880 ⁽¹⁾ /10	✓	–	☒	S	S ⁽³⁾	500	15	
	Herador C	14,4	880 ⁽¹⁾ /10	–	–	☑	S	L ⁽³⁾	500	15	
	Herador S	14,3	880 ⁽¹⁾ /5	✓	–	☑	S	L ⁽³⁾	500	15	
	Herador G	13,9	880 ⁽¹⁾ /5	✓	–	☑	S	S ⁽³⁾	500	15	
	Herador GG	14,5	880 ⁽¹⁾ /10	✓	–	☑	S	L ⁽³⁾	500	15	
	Herador H	13,9	880 ⁽¹⁾ /5	–	–	☑	S	S ⁽³⁾	600	15	
Herador NH	13,9	880 ⁽¹⁾ /5	–	–	☑	S	S ⁽³⁾	600	15		
reduced gold	Heraloy G	13,9	880 ⁽¹⁾ /5	–	–	☑	S	S ⁽³⁾	650	15	
	Herabond	14,5	880 ⁽¹⁾ /5	–	–	☑	S	L ⁽³⁾	650	15	
	Herabond N	14,2	880 ⁽¹⁾ /5	–	–	☑	S	L ⁽³⁾	600	15	
Pd-based	Albabond B	13,5	880 ⁽¹⁾ /10	–	–	☑	S	S ⁽³⁾	600	15	
	Albabond A	14,7	880 ⁽¹⁾ /5	–	–	☑	S	L ⁽³⁾	600	15	
	Heralight	14,4	880 ⁽¹⁾ /5	–	–	☑	S	L ⁽³⁾	600	15	
Hera Sun	HeranormSun	16,1	800/10	–	575/20	☒	S	–	550 ⁽⁵⁾	15 ⁽⁵⁾	
	MainbondSun	16,3	800/10	–	650/15	☒	S	–	500 ⁽⁵⁾	10 ⁽⁵⁾	
	AureaSun	16,1	800/10	–	600/15	☒	S	–	500	15	
	AlbaSun	16,6	800/10	–	800/15	☒	S	–	550	15	
universal	Bio Heranorm	16,0	800 ⁽²⁾ /10	✓	700/10	☒	S	S ⁽³⁾	550	15	
	Mainbond EH	16,0	800 ⁽²⁾ /10	–	750/5	☒	S	N ⁽³⁾	450	15	
	Mainbond A	16,3	800 ⁽²⁾ /10	–	750/10	☒	S	N ⁽³⁾	500	15	
	Keramigold PKF	15,7	800 ⁽²⁾ /3	–	800/5	☒	S	N ⁽³⁾	500	15	
	Keramigold N	15,9	800 ⁽²⁾ /15	–	800/15	☒	S	N ⁽³⁾	500	15	
	Hera KF	16,7	800 ⁽²⁾ /5	✓	750/15	☒	S	L ⁽³⁾	450	15	
	Hera Ecobond	16,9	800 ⁽²⁾ /10	–	–	☒	S	L ⁽³⁾	500	15	
	Heradent	16,2	800 ⁽²⁾ /10	–	900/15	☒	S	N ⁽³⁾	550	15	
	Herabest	16,7	800 ⁽²⁾ /5	✓	700/15	☒	S	L ⁽³⁾	550	15	
	Herastar	16,6	800 ⁽²⁾ /10	–	750/15	☒	S	L ⁽³⁾	– ⁽⁵⁾	– ⁽⁵⁾	
high gold content	Bio Maingold SG	–	–	–	750/5	–	–	–	350	15	
	Maingold SG	–	–	–	750/5	–	–	–	350	15	
	Maingold MP	–	–	–	750/30	–	–	–	450	15	
	Maingold Premium	–	–	–	750/5	–	–	–	450	15	
	Maingold OG	–	–	–	750/5	–	–	–	450	15	
	Bio Maingold TK	–	–	–	800/15	–	–	–	350	15	
	Bio Maingold IT	–	–	–	750/15	–	–	–	300	15	
	Bio Maingold I	–	–	–	750/15	–	–	–	400	15	
reduced gold	Hera SG	–	–	–	750/15	–	–	–	400	15	
	Hera GG	–	–	–	750/15	–	–	–	400	15	
	Hera PF	–	–	–	750/15	–	–	–	400	15	
non precious ceramic bonding alloys	Ceramic Bonding Alloys (CoCr) acc. to EN ISO 9693 and 22674										
	Heraenium P	13,8	950 ⁽³⁾ /10	✓ ⁽³⁾	–	☑	HeraCeram/f*	n ⁽³⁾	–	–	
	Heraenium Pw	14,3	– ⁽³⁾	– ⁽³⁾	–	– ⁽³⁾	HeraCeram/f*	n ⁽³⁾	–	–	
	Ceramic Bonding Alloys (NiCr) acc. to EN ISO 9693 and 22674										
	Heraenium NA	14,1	950/10 ⁽³⁾	–	–	☑	HeraCeram/f*	f ⁽²⁾	–	–	
	Heraenium S	13,7	950/10 ⁽³⁾	–	–	☑	HeraCeram/f*	f ⁽³⁾	–	–	
Universal Bonding Alloy (CoCr) acc. to EN ISO 22674 and 9693											
HeraeniumSun	16,2	– ⁽³⁾	– ⁽³⁾	–	–	– ⁽³⁾	HeraCeramSun/f*	n ⁽³⁾	–	–	
partial denture alloys	Partial Denture Alloys (CoCr) acc. to EN ISO 22674										
	Heraenium CE	–	–	–	–	–	–	–	–	–	
	Heraenium EH	–	–	–	–	–	–	–	–	–	
	Heraenium Laser	–	–	–	–	–	–	–	–	–	

* Notes: See legend ceramic firing

	Prior to Ceramic Firing						After Ceramic Firing		Alloy also available as		
	Solder	Working temperature °C* / Solder colour				Solder	Flux**	Laser welding wire			
		Work. temp. °C / solder colour						ø 0,5 mm x 200 mm	ø 0,3 mm x 200 mm		
Implant	Bio Supra Ceram	Herador (PF) Lot			(PF) 1040	1060 S	Herador / Maingold PF Lot	800	✓	–	
	Bio Ceram Plus	Herador PF Lot				1010 ⁶⁾	Herador / Maingold PF Lot	800	✓	✓	
	Bio Herador SG	Herador PF Lot			1040	1010 ⁶⁾	Herador / Maingold PF Lot	800	✓	✓	
	Bio Herador CN	Herador PF Lot			1040	1010 ⁶⁾	Herador / Maingold PF Lot	800	Bio Herador N ²⁾		
	Bio Herador N	Herador PF Lot			1040	1010 ⁶⁾	Herador / Maingold PF Lot	800	✓	✓	
	Bio Herador GG	–					Herador / Maingold PF Lot	800	✓	–	
	Bio Herador MP	Herador PF Lot			1040	1010 ⁶⁾	Herador / Maingold PF Lot	800	Herador MP ²⁾		
	Herador EC	Herador PF Lot				1010 ⁶⁾	Herador / Maingold PF Lot	800	✓	–	
	Herador MP	Herador PF Lot			1040	1010 ⁶⁾	Herador / Maingold PF Lot	800	✓	✓	
	Herador PF	Herador PF Lot			1040	1010 ⁶⁾	Herador / Maingold PF Lot	800	✓	✓	
	Herador C	Herador PF Lot			1040	1010 ⁶⁾	Herador / Maingold PF Lot	800	✓	✓	
	Herador S	Herador Lot		1070	1060	1060 S	Herador / Maingold Lot	800	✓	–	
	Herador G	Herador Lot				1060 S	Herador / Maingold PF Lot	800	✓	✓	
	Herador GG	–					Herador / Maingold PF Lot	800	✓	✓	
	Herador H	Herador Lot	1100	1070	1060	1060 S	Herador / Maingold Lot	800	✓	✓	
Herador NH	Herador Lot	1100	1070	1060	1060 S	Herador / Maingold Lot	800	✓	✓		
reduced gold	Heraloy G	Herador Lot		1070	1060	1060 S	Herador Lot V ¹⁾	800	✓	✓	
	Herabond	Herador Lot	1100	1070	1060	1060 S	Herador Lot V ¹⁾	800	✓	–	
	Herabond N	Herador Lot	1100	1070	1060	1060 S	Herador Lot V ¹⁾	800	Herabond ²⁾	–	
Pd-based	Albabond B	Herador Lot		1070	1060	1060 S	Herador Lot V ¹⁾	800	✓	✓	
	Albabond A	Herador Lot	1100	1070	1060	1060 S	Herador Lot V ¹⁾	800	Albabond B ²⁾		
	Heralight	Herador Lot		1070	1060	1060 S	Herador Lot V ¹⁾	800	–	–	
 Hera	HeranormSun	HeraSun Lot 1			900		HeraSun Lot 2	710 ⁵⁾	✓	✓	
	MainbondSun	HeraSun Lot 1			900		HeraSun Lot 2	710 ⁵⁾	✓	✓	
	AureaSun	HeraSun Lot 1			900		HeraSun Lot 2	710 ⁵⁾	✓	✓	
	AlbaSun	HeraSun Lot 1			900		HeraSun Lot 2	710 ⁵⁾	✓	✓	
universal	Bio Heranorm	HeraSun Lot 1			900		HeraSun Lot 2	710 ⁵⁾	✓	✓	
	Mainbond EH	Mainbond Lot			875		HeraSun Lot 2	710 ⁵⁾	✓	✓	
	Mainbond A	Mainbond Lot			875		HeraSun Lot 2	710 ⁵⁾	✓	✓	
	Keramikgold PKF	Spezial Lot			970		HeraSun Lot 2	710 ⁵⁾	Bio Heranorm ²⁾		
	Keramikgold N	HeraSun Lot 1			900		HeraSun Lot 2	710 ⁵⁾	Bio Heranorm ²⁾		
	Hera KF	Mainbond Lot			875		HeraSun Lot 2	710 ⁵⁾	✓	✓	
	Hera Ecobond	HeraSun Lot 1			900		HeraSun Lot 2	710 ⁵⁾	Hera KF ²⁾		
	Heradent	Mainbond Lot			875		HeraSun Lot 2	710 ⁵⁾	AlbaSun ²⁾		
	Herabest	HeraSun Lot 1			900		HeraSun Lot 2	710 ⁵⁾	Hera KF ²⁾		
	Herastar	HeraSun Lot 1			900		HeraSun Lot 2	710 ⁵⁾	Hera KF ²⁾		
high gold content	Bio Maingold SG	Herador / Maingold PF Lot 800		Maingold PF Lot 750					✓	✓	
	Maingold SG	Maingold Lot 850	Herador / Maingold Lot 800		Maingold / Hera Lot 750				Bio Maingold SG ²⁾		
	Maingold MP	Herador / Maingold PF Lot 800		Maingold PF Lot 750					✓	✓	
	Maingold Premium	Maingold Lot 850	Maingold / Hera Lot 750		Herador/Maingold Lot 800				Bio Maingold SG ²⁾		
	Maingold OG	Maingold Lot 850	Herador / Maingold Lot 800		Maingold / Hera Lot 750				Mainbond EH ²⁾		
	Bio Maingold TK	Herador / Maingold PF Lot 800		Maingold PF Lot 750					Bio Herador N ²⁾		
	Bio Maingold IT	Herador / Maingold PF Lot 800		Maingold PF Lot 750					Bio Maingold SG ²⁾		
Bio Maingold I	Herador / Maingold PF Lot 800		Maingold PF Lot 750					Bio Maingold SG ²⁾			
reduced gold	Hera SG	Hera Lot 800		Maingold / Hera Lot 750					Hera GG ²⁾		
	Hera GG	Hera Lot 800		Maingold / Hera Lot 750					✓	✓	
	Hera PF	Herador / Maingold PF Lot 800		Maingold PF Lot 750					✓	✓	
non precious ceramic bonding alloys	Ceramic Bonding Alloys (CoCr) acc. to EN ISO 9693 and 22674										
	Heraenium P	Heraenium P Lot 1			1180 ⁸⁾		Stahlgold Lot 750		*	CoCr Laser welding wire ²⁾	–
	Heraenium Pw	Heraenium P Lot 1			1180 ⁸⁾		Stahlgold Lot 750		*	CoCr Laser welding wire ²⁾	–
	Ceramic Bonding Alloys (NiCr) acc. to EN ISO 9693 and 22674										
	Heraenium NA	Heraenium NA Lot 1			1150 ⁸⁾		Stahlgold Lot 750		*	–	–
	Heraenium S	Heraenium NA Lot 1			1150 ⁸⁾		Stahlgold Lot 750		*	–	–
Universal Bonding Alloy (CoCr) acc. to EN ISO 22674 and 9693											
HeraeniumSun	Heraenium Sun Lot 1			1185 ⁸⁾		Stahlgold Lot 750		*	CoCr Laser welding wire ²⁾	–	
partial denture alloys	Partial Denture Alloys (CoCr) acc. to EN ISO 22674										
	Heraenium CE	Stahlgold Lot 750 ⁷⁾ Stahlgold Lot 910			* ⁸⁾		–		–	CoCr Laser welding wire ²⁾	–
	Heraenium EH	Stahlgold Lot 750 ⁷⁾ Stahlgold Lot 910			* ⁸⁾		–		–	CoCr Laser welding wire ²⁾	–
Heraenium Laser	Stahlgold Lot 750 ⁷⁾ Stahlgold Lot 910			* ⁸⁾		–		–	CoCr Laser welding wire ²⁾	–	

*Notes: See legend use of solders

Page 5: Composition and Technical Data of Solders according to EN ISO 9333

	Colour	Content in mass %										Melting range		Use	Working temp. °C
		Au	Ag	Pt	Pd	Cu	In	Zn	Ir	Ru	Others	Solidus °C	Liquidus °C		
Solders for Ceramic Bonding Alloys															
Herador Lot 1100		79,8	7,9	–	7,4	3,8	–	1,0	x	x	–	1030	1095	A	1100
Herador Lot 1070		62,5	3,0	–	16,4	16,0	1,0	1,0	x	x	–	1010	1065	A	1070
Herador Lot 1060		71,9	5,0	–	12,0	8,0	1,0	2,0	x	x	–	1000	1045	A	1060
Herador Lot 1060 S		68,9	20,0	9,0	–	–	–	1,0	0,1	–	1,0 Sn	1005	1060	A	1060
Herador PF Lot 1040		79,0	16,6	3,0	–	–	–	1,3	0,1	–	–	990	1035	A	1040
Herador Lot 1030		64,0	35,0	–	0,45	–	0,5	–	x	x	–	980	1030	A	1030
Herador PF Lot 1010		77,4	18,0	1,97	–	–	–	2,5	–	x	0,1 Mn	940	995	A	1010
Herador / Maingold Lot 800		70,5	6,5	–	1,4	13,0	5,5	3,0	x	x	–	715	785	B	800
Herador / Maing. PF Lot 800		70,5	6,5	1,4	–	13,0	5,5	3,0	0,1	–	–	715	785	B	800
Herador Lot V 800		38,0	36,7	–	–	25,0	–	0,3	–	–	–	775	785	B	800

Solders for Universal Alloys

HeraSun Lot 1		79,0	13,5	1,45	–	–	–	6,0	x	–	–	820	890	1/A	900
HeraSun Lot 2		73,0	12,0	0,45	–	–	–	14,5	x	–	–	670	700	2/B	710
Mainbond Lot 875		75,5	12,0	0,45	–	9,5	–	2,5	x	–	–	825	875	1/A	875
Spezial Lot 970		68,0	23,5	4,4	–	–	–	4,05	x	–	–	900	965	1/A	970

Solders for High Gold Content Casting Alloys

Maingold Lot 850		70,5	5,0	–	3,9	13,0	5,5	2,0	x	x	–	770	850	1	850
Herador/Maingold Lot 800		70,5	6,5	–	1,4	13,0	5,5	3,0	x	x	–	715	785	1	800
Maingold/Hera Lot 750		59,8	14,8	–	0,2	15,2	6,0	4,0	–	–	–	650	755	2	750
Herador/Maing. PF Lot 800		70,5	6,5	1,4	–	13,0	5,5	3,0	0,1	–	–	715	785	1	800
Maingold PF Lot 750		59,8	14,8	0,2	–	15,2	6,0	4,0	–	–	–	675	745	2	750
U-Lot 820		71,5	16,0	1,0	0,9	–	–	10,5	x	x	–	730	805	1	820
Hera Lot 800		55,6	18,0	–	4,4	11,9	6,0	4,0	x	x	–	720	790	1	800

Solders for Precious and Non-Precious Alloys

Stahlgold Lot 750		42,0	24,4	–	3,0	16,5	7,0	4,0	x	x	3,0 Mn	660	760	EM/CoCr	750
Stahlgold Lot 910 !!		80,0	–	–	–	–	–	4,0	–	–	1,0 Sn/15,0 Ni	855	910	NEM/CoCr	910

Stahlgold Lot 910 contains Nickel!

	Content in mass %											Melting range		Use
	Co	Cr	Fe	Si	Mo	B	V	Mn				Solidus °C	Liquidus °C	
Heraenium P Lot 1	38,7	21,8	29,0	5,4	2,7	1,0	1,0	0,4	–	–	–	1040	1180	1/A

	Content in mass %											Melting range	
	Au	Pd	Cu	In	Mn	Ir	Ru					Solidus °C	Liquidus °C
Heraenium NA Lot 1	58,9	22,0	15,0	1,0	3,0	x	x	–	–	–	–	1150	

	Content in mass %											Melting range		Use
	Co	Cr	Fe	Si	Mo	B	V	Mn				Solidus °C	Liquidus °C	
HeraeniumSun Lot 1	27,1	21,8	41,6	5,4	2,7	1,0	–	0,4	–	–	–	1095	1185	1/A

CoCr Laserschweißdraht	65,3	28	–	0,5	5,5	–	–	0,7	–	–	–	–	–	–
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*Notes: See legend Composition and Technical Data of Solders according to EN ISO 9333

Legend to page 1: Composition

Application		Remarks																												
		<p>x = Mass content < 0,1 Mass %</p> <p>A) = A stable framework design with reinforced connections with a cross-section of 8 – 10 mm² is required for long span bridges and suprastructures. Additionally, the frameworks need to be hardened.</p> <p>B) = Depending on the copper content, in some cases discoloration of double crowns may result after short period of wearing. Discoloration, however, is technically and physiologically harmless.</p> <p>C) = In exceptional cases these alloys can also be used for traditional telescopic crowns with parallel walls and for the bar casting technique provided that cross-sections for crown walls, approximal areas, bars and laser welded joints are particularly thick and the alloy is hardened subsequently. No indication for conical crowns and shear distributors.</p> <p>D) = Type classification acc. EN ISO 22674</p>																												
<p>Colour of alloy</p> <p> = white</p> <p> = pale yellow</p> <p> = yellow</p> <p> = rich yellow</p>																														
<table border="1"> <thead> <tr> <th>Type</th> <th>0,2% Yield strength R_{p0,2} (MPa) minimum</th> <th>Elongation (%) minimum</th> <th>Young's modul (GPa) minimum</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>–</td> <td>–</td> <td>–</td> </tr> <tr> <td>1</td> <td>80</td> <td>18</td> <td>–</td> </tr> <tr> <td>2</td> <td>180</td> <td>10</td> <td>–</td> </tr> <tr> <td>3</td> <td>270</td> <td>5</td> <td>–</td> </tr> <tr> <td>4</td> <td>360</td> <td>2</td> <td>–</td> </tr> <tr> <td>5</td> <td>500</td> <td>2</td> <td>150</td> </tr> </tbody> </table> <p>w = After soft annealing and quenching</p> <p>k = Bonding alloy; condition after ceramic firing</p> <p>v = Condition after hardening</p> <p>s = Self-hardening alloy, after slow cooling in the mould</p>			Type	0,2% Yield strength R _{p0,2} (MPa) minimum	Elongation (%) minimum	Young's modul (GPa) minimum	0	–	–	–	1	80	18	–	2	180	10	–	3	270	5	–	4	360	2	–	5	500	2	150
Type	0,2% Yield strength R _{p0,2} (MPa) minimum		Elongation (%) minimum	Young's modul (GPa) minimum																										
0	–		–	–																										
1	80		18	–																										
2	180		10	–																										
3	270		5	–																										
4	360		2	–																										
5	500	2	150																											

Legend to page 2: Technical Data, Melting and Casting

Contraindications	Remarks
In case of hypersensitivity (allergies) to one of the constituents of the alloy.	<p>w = After soft annealing and quenching</p> <p>k = Bonding alloy; condition after ceramic firing</p> <p>v = Condition after hardening</p> <p>s = Self-hardening alloy, after slow cooling in the mould</p>
Side effects	<p>1) Acc. to EN ISO 22674</p> <p>2) 1 MPa = 1 N/mm², 1 GPa = 1000 N/mm²</p> <p>3) When veneered with ceramics, these alloys do not require any additional hardening process to provide their max. physical values.</p> <p>4) Normally, the pre-heating temperature shall be 900 °C. In case of form filling problems with thin copings we recommend to raise the pre-heating temperature to 950 °C.</p> <p>5) For cast-on technique.</p>
In individual cases hypersensitivity reactions (allergies) or electrochemically conditioned, local malsensations were reported.	
Interactions with other dental alloys	<p>Melting Crucible</p> <p>G = Graphite</p> <p>C = Ceramic</p> <p>Ceramic-NPM = Ceramic crucibles for non precious metal alloys</p>
With approximal or antagonist contact with dentures of different alloys galvanic effects may occur. Other materials must be used instead if contact with other alloys causes persistent local paraesthesia on an electrochemical basis.	

Legend to page 3: Ceramic Firing

Remarks	Cooling after Ceramic Firing (from first dentine firing until and including glaze firing)
<p>1) When veneering with ceramics with higher firing temperature, oxide firing must be carried out at the highest ceramic firing temperature, max. temperature of 950 °C must not be exceeded.</p> <p>2) Oxide firing: Please follow the instructions of the ceramic manufacturer.</p> <p>3) Follow the instructions of the ceramic manufacturer.</p> <p>4) Hardening prior to firing (conditioning for milling techniques): 930 °C, 15 min, rapid cooling.</p> <p>5) When veneered with ceramics, these alloys do not require any additional hardening process to provide their maximum physical values.</p> <p>6) 25 – 500 °C acc. EN ISO 9693</p>	<p>f = Rapid cooling</p> <p>At the end of the program the firing platform is completely and firing tray with objects is removed immediately. The firing tray can cool next to the furnace on a fire-resistant tray.</p> <p>n = Normal cooling (Stress relief cooling)</p> <p>The firing platform is driven down at the end of the program and the firing tray is left in the radiated heat for 2 – 3 minutes before it is removed.</p> <p>s = Slow cooling</p> <p>Depending on programming of the furnace either slow cooling to the initial temperature can be performed for approx. 4 – 6 minutes or a tempering phase of 3 – 5 minutes can be set at approx. 800 °C (high-melting alloys) resp. at approx. 700 °C (low-melting alloys).</p> <p>Rapid cooling can always be performed for oxide and opaque firings.</p> <p>* = Relaxation cooling is recommended for lang span, bulky frameworks</p>
	<p>Treatment of the framework surface after oxide firing</p> <p> = Pickling in Hera AM 99 ca. 70 °C/10 min.</p> <p> = Sandblasting with 125µm Aluminium Oxide</p>

Legend to page 4: Use of Solders / Laser Welding Wires

Remarks	Colour of solders
<p>* The working temperature is part of the solder's name.</p> <p>** Recommended flux: Precious metal / precious metal: Hera UL 99</p> <p>Precious metal / non precious metal: Hera SLP 99</p> <p>Non precious metal / non precious metal: Hera SLP 99</p> <p>1) Herador Lot V800 must be soldered under vacuum. Graphite firing trays should be used.</p> <p>2) Recommended alternative alloy.</p> <p>3) Carbon free laser welding wire ø 0.5 mm.</p> <p>4) Use appropriate precious metal casting alloy.</p> <p>5) When processed with HeraCeram.</p> <p>6) Accurate temperature control must be ensured. 740 °C must not be exceeded. Maximum heat-rate: 55 °C / min.</p> <p>7) When soldering high palladium content alloys onto CoCr castings prepare solder surfaces using Herador Lot 1060. Then solder with Stahlgold Lot 750.</p> <p>8) Soldering by open flame.</p>	<p> = white</p> <p> = pale yellow</p> <p> = yellow</p>

Legend to page 5: Competition and Technical Data of Solders according to EN ISO 9333

Annotation	Colour of solders
<p>A = Prior to Ceramic Firing</p> <p>B = After Ceramic Firing</p> <p>1 = Primary Solder</p> <p>2 = Secondary Solder</p> <p>x = Mass Content < 0.1 %</p> <p>!! = Attention! Contains Nickel!</p> <p>The actual Instructions for use for HeraCeram and for HeraCeramSun are applicable.</p>	<p> = white</p> <p> = pale yellow</p> <p> = yellow</p>

Alba®, Alband®, AlbaSun®, AureaSun®, BioCeramPlus®, BioSupraCeram®, Hera®, Heraenium®, Herabond®, HeraCeram®, Herador®, Heraloy®, HeranormSun®, HeraSun®, Mainbond®, MainbondSun®, Maingold®, Preciano® = registered trademarks of Heraeus Kulzer

Aurea = Trade Name

The alloys of our current delivery program are listed in this table of technical data. Further alloys can be supplied on request.

Precious Metal Wire acc. EN ISO 22674

CE 0197	Type ¹⁾	Colour	Application	Content in mass %							
				Au	Ag	Pt	Pd	Cu	Ir	Ru	Others
Maingold NO	1		9,11	73,0	19,4	5,0	2,6	–	–	–	–
Maingold O	4		13	70,0	12,5	7,0	0,4	10,0	0,1	–	–
Heraplat	3/4		9	61,0	–	23,8	15,0	–	–	–	0,2 Rh

	Melting range ¹⁾		Preheating	Density ¹⁾	Hardness		0,2% Yield strength ¹⁾		Elongation ¹⁾	
	Solidus	Liquidus	Temperature	g/cm ³	HV5		MPa ²⁾		%	
	°C	°C	°C		w/k	v	w/k	v	w/k	v
Maingold NO	1100	1170	750 ⁵⁾	16,5	60	–	110	–	34	–
Maingold O	890	970	–	15,7	180	285	430	740	26	10
Heraplat	1360	1460	750	18,0	135	250	350	780	24	15

	Oxide Firing/Soft Annealing		Hardening	
	°C	min	°C	min
Maingold NO	800	2	–	–
Maingold O	750	2	400	15
Heraplat	1100	2	700	30

	Prior to Ceramic Firing		After Ceramic Firing		Alloy also available as	
	Solder	Working temperature °C*	Solder	Flux** Working temp.* °C	Laser welding wire	
					ø 0,3 mm	ø 0,5 mm
Maingold NO	Maingold Lot 850	Herador / Maingold Lot 800	Maingold / Hera Lot 750	*	} Wire from regular supply or ³⁾	
Maingold O	Maingold Lot 850	Herador / Maingold Lot 800	Maingold / Hera Lot 750	*		
Heraplat	Solder for casting alloy used					

Wire	Profile	Dimensions in mm
Maingold NO	●	0,3 / 0,45
Maingold O	●	0,7 / 0,8 / 0,9 / 1,0 / 1,1 / 1,2 / 1,5 / 1,8 / 2,0
Maingold O	◐	0,75 x 1,5 / 0,9 x 1,8
Maingold O	◑	1,1 x 1,65
Heraplat	●	0,7 / 0,8 / 1,0 / 1,2 / 1,3 / 1,5 / 1,8 / 2,0

Precious metal special material	Type ³⁾	Indication	Application	Presentation	Components after utilization
Preciano Bio Goldbath universal	0	1,2,3,17	Gold electrolyte	16,0 g Au/l	Fine gold
Blendgold Neu	–	7	Precious metal paste + ceramic	4,8 g syringe	Fine gold + ceramic particles
Blendgold Spezial	–	8	Precious metal paste	4,0 g syringe	Fine gold

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