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CASTING MANUAL

VER. 1.1 October 2005





Purpose of this manual

This casting manual is provided to help users utilize the Neo Super Cascom unit to its maximum capabilities by listing the various technical information and suggestions for successful dental castings. Please read the manual fully prior to using the unit.

Contents

Castable Alloys and Crucible Types		1
Fabrication of Wax Patterns and Spruing General Spruing Suggestions Spruing Inlay Patterns	2 3	2
Spruing Crown Patterns	3	
Spruing Bridge Patterns	4	
Spruing Denture Patterns	4	
Technique with Refractory Model	4	
Direct Casting Technique		
Investing		7
Precautions when investing	7	
Choosing an investment	9	
Casting Programs		9
Crucibles		10
Precautions when you set crucible		
Maximum melting of alloy	10	
Tips for crucible care	11	
Alloy Melting		11
Casting Rings		11
Casting		12
Casting Cycle Finish		12
Miscellaneous		12
Precautions for Ceramic Crucible	12	
Reference Programs (Examples)		13
Recommendable Casting Programs by Alloy Types	13	

Castable Alloys and Crucible Types

According to the type of casting alloy, user should choose a crucible type and whether argon gas flow is necessary or not as shown in the chart below. (Chart 1)

Alloys	Crucibles	Argon Gas
Silver Alloys	Carbon	×
Gold Alloys (Platinum)	Carbon	×
Silver/Gold/Palladium Alloys	Carbon	×
Porcelain bonding Precious Alloys	Carbon	×
Porcelain bonding Semi-Precious Alloys	Carbon	×
(Pd contained less than 30%)		
Porcelain bonding Semi-Precious Alloys	Ceramic	
(Pd contained over 30%)		
Porcelain bonding Palladium Alloys	Ceramic	
Porcelain bonding Non-Precious Alloys	Ceramic	
Ni-Cr Alloys	Ceramic (Use Flux)	
Co-Cr Alloys	Ceramic	

We recommend you to use flux to facilitate smooth flow of melted alloy. Prior to inserting alloy ingots, drop one tab of flux into crucible.

(Chart 1)

Fabrication of Wax Patterns and Spruing

To create highly precise and accurate casting results, we recommend you to use such accessories for spruing wax patterns as casting rings and sprue formers provided for the Neo Super Cascom unit to prevent miscasts etc.

General Spruing Suggestions

Each case has the following points in common that apply to all castings.

Former and wax pattern should be sprued as thick and in short distance as possible.

Runner Bar 3.0 ~ 3.5mm diameter

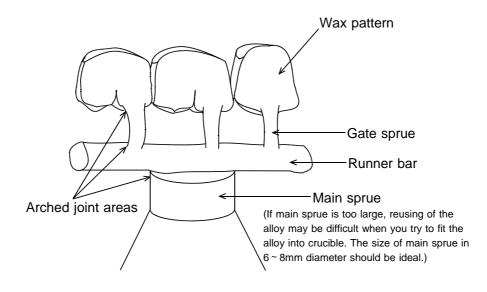
Gate Sprue 2.0 ~ 2.5mm diameter, 3/16"(5mm) in length, to be sprued with each neighboring crown and bridge pattern.

Main Sprue $6.0 \sim 8.0$ mm diameter up to 3/8"(10mm) in length max.

To facilitate flow of melted alloy, the joint areas of each sprue should be given a slight arch.

When embedding wax pattern, we recommend you to have a space of 13/16"(20mm) between the top of wax pattern and the top surface of casting ring and a space of 3/8"(10mm) between wax pattern and ring liner.

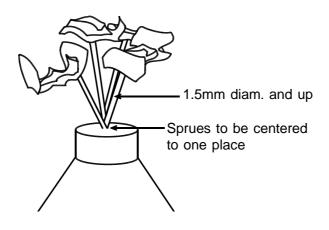
In case of ringless casting, leave more leeway in these minimum distance guidelines.



Spruing Inlay Patterns

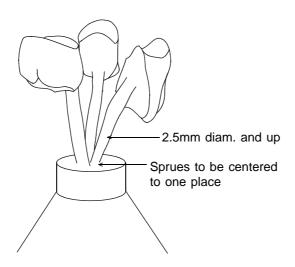
The use of sprue in 1.5mm diameter and up is recommendable. When you invest multiple patterns, try to center the sprues possibly to one place for funneling of melted alloy.

With inlay pattern, if casting ring is insufficiently heated, one of the patterns will act as an air vent to result in terrible mis-casts. Sufficient heating of casting ring is recommended.



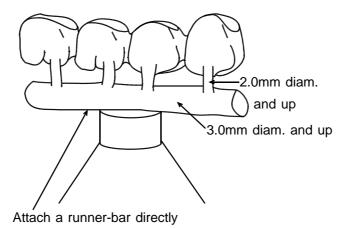
Spruing Crown Patterns

The use of sprue 2.5mm diameter and up is recommendable. Multiple patterns are recommended to be sprued possibly to one place as shown in the sketch.



Spruing Bridge Patterns

We recommend you to attach a runner-bar directly on the top of main sprue and connect all patterns including pontics with gate sprues. Even in case of long span bridge, positioning of patterns and sprue cone possibly at a short distance is recommended.



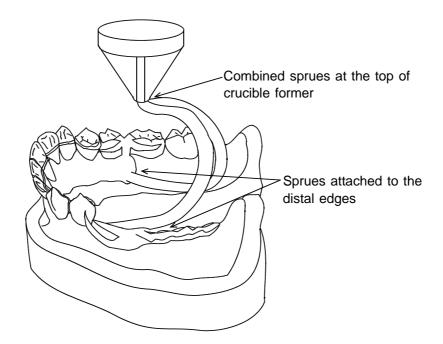
Spruing Denture Patterns

In case of partial dentures, both maxilla and mandible, attach a line sprue to each distal edge to combine the two sprues into one sprue at the top of a crucible former. In case of full plate denture, in addition to the two sprues, we recommend you to attach a supplemental line sprue from the top of crucible former to the near midline of denture. The use of each line sprue 3.0mm diameter and up is recommended.

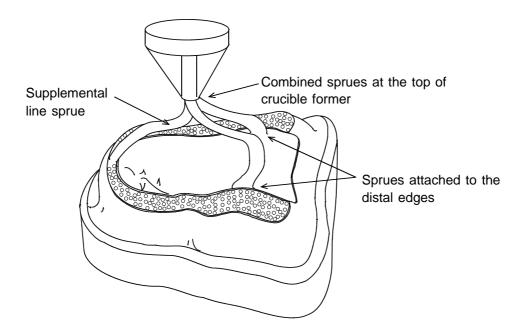
Technique with Refractory Model

Maxilla Combined sprues at the top of crucible former Sprues attached to the distal edges

Mandible

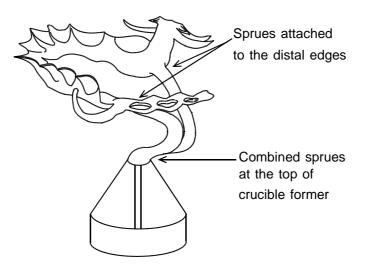


Full Denture

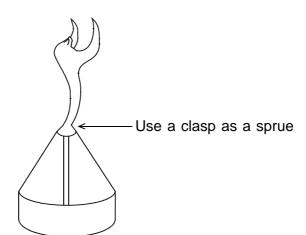


Direct Casting Technique

Pattern Extraction



Casting with a Clasp alone

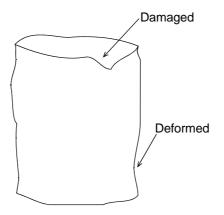


Investing

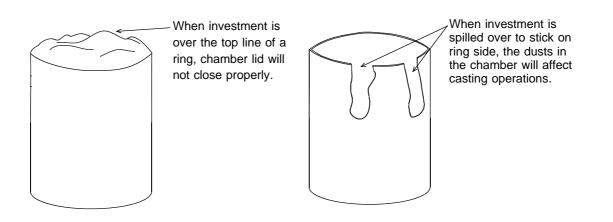
Precautions when investing

Casting rings and sprue formers provided for the Neo Super Cascom unit is recommended to use. When you use such accessories other than those provided, make sure that the height of the rings is 1.31/32" ~ 2.3/4"(50 ~ 70mm). If the existent ring height is shorter than 1.31/32"(50mm), use a fireproof ceramic plate to adjust the ring height in 1.31/32" ~ 2.3/4"(50 ~ 70mm) before casting operation.

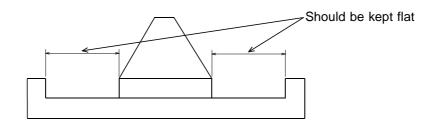
Casting rings will get deformed or damaged against continuous uses. The uses of such inadequate rings will cause machine malfunction. As described in the instruction manual, we do not recommend to use such deformed or damaged rings.



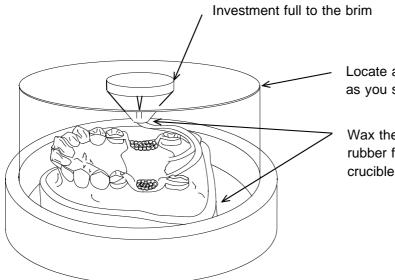
When you invest make sure that the investment will not heap up over the top surface of a ring. Too much investment may cause machine malfunction.



Keep the flat area of inside former clean to prevent the unit from malfunctioning.



Precautions when you use a ringless ring



Locate a plastic ring in place as you see in the sketch

Wax the model to stabilize on the rubber former and make sure the crucible former is positioned in the center

Fill investment up to the brim

Remove the crucible former after investment hardened

Ring height should be over 2 3/8" (60mm). If lower, the unit may malfunction

Choosing an investment

We recommend you to use the investment for dental casting on the markets. The Neo Super Cascom unit, being a vacuum and pressure casting type, investing material of non-porous and fine quality is recommendable. Phosphate investment that contains carbon or the investment that requires high speed heatup may cause mis-cast by the gas generated inside casting mold. We recommend you to heat up 30 minutes further longer than the instructed heating time by the manufacturer. You have no problem with high speed christobalite type of investment.

Casting Mold Heatup

In regard to casting mold heatup program, we recommend you to follow each manufacturer's instruction. However, we recommend you to program the final stage temperature for investing material as follows.

Christobalite1328 °F (720) and upPhosphate1562 °F (850) and upPhosphate for Non-Precious Metal1742 °F (950) and up

Each investment should have the hold time of over one hour. Depending on each manufacturer's burnout furnace, the heat on display and muffle heat will not necessarily coincide due to the deviations of heat distributions in muffle and measuring gauges equipped.

Casting Programs

You have two modes of casting program storage, Auto Program and Manual Program. Please see the Instruction Manual provided for further details.

Each Program Mode and Features

Auto Program mode : The storage of alloy liquidus temperature, alloy quantity, investment type and type of crucible will allow you to store automatically standard program for casting. The stored program is also modifiable with the manual program mode.
Manual Program Mode : According to the chart shown below, a program for alloy melting is storable. This mode is good for storing an original program you desire. (Chart 2)

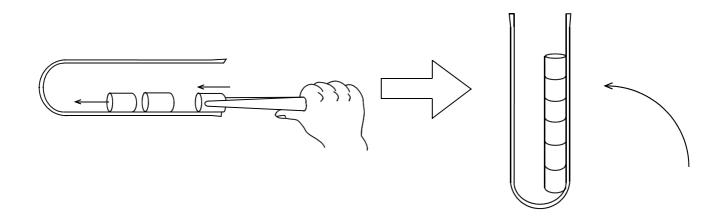
PRG. Alloys	Start Temp.	Melt. Temp.	Melt. Time	Casting Timing	Cool. Time	
Gold Alloy Platinum Silver Alloy Au/Ag/Pd Alloy	90 °F (50) lower than instructed liquidus temp.	90 ~ 126 $^{\circ}$ F (50 ~ 70) higher than instructed temp.		0.3 sec.	1min./10g (0.35 Oz.) 3 min./10g (0.35 Oz.)	
Porcelain Bonding Precious Porcelain Bonding Semi-Precious Porcelain Bonding Palladium	180 °F (100) lower than instructed liquidus	Instructed liquidus temp. plus 10% of liquidus temp.	3 min.	0.2 sec.	1 min./10g (0.35 Oz.)	
Porcelain Bonding Non-Precious Ni-Cr Alloy Co-Cr Alloy	temp.	Liquidus temp. plus 10% of liquidus temp. but not exceeding 2732 °F (1500)	6 min.	-0.3 sec.		

(Chart 2)

Crucibles

Precautions when you set crucible

Choose a crucible suitable for alloy melting and casting and put required amount of alloy ingots into crucible. Depending on the ingot shape, the ingots may get stuck during melting and will not melt completely in the crucible. We recommend you to place ingots as shown in the sketch below. We do not recommend you to use shot type ingots as they get expanded when melted and get crammed to easily break or crack the crucible. Each crucible is recommended to be used for the same type of alloy exclusively.



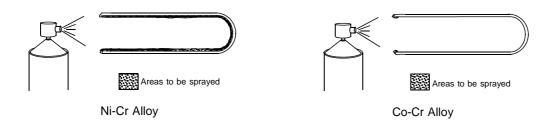
Maximum Melting of Alloy

The Neo Super Cascom unit is capable of melting precious alloys and non-precious alloys max. 150g(5.3 Oz.) and 45g(1.6 Oz.) respectively. And the life of muffle heater is greatly depended on the range of melting temperature and alloy quantity to melt and cast.

Precious alloys are recyclable for casting but more than 50 % of fresh alloy should be included when you reuse the alloy. Non-precious Co-Cr and Ni-Cr are not recommendable for recycling.

Tips for Crucible Care

When you cast Ni-Cr alloys, we recommend you to use crucible coating spray to facilitate alloy's smooth flow as shown in the sketch below. In case of Co-Cr alloy, we recommend you to spray the coating material around the opening area of the crucible.



When the sprays come in contact with the bar-code of the crucible, the unit may have difficulty in reading the bar-code. We recommend you to clean the crucible with thinning liquid to avoid reading errors.

As described in the instruction manual, we recommend you not to use damaged crucible or the crucible of which life cycle is over.

Once the crucible is ready for melting with alloys in it, put the crucible into retort of the muffle.

Alloy Melting

Press the Melt button to melt alloy. Refer to Chart 1 to see if argon gas should be used and press the Argon Flow button to proceed with the stored program. If the pocket pager is also in operation, the unit will allow you to undertake other jobs away from the unit. When the pager rings to let you know the end of alloy melting cycle, press the Vibes button to check the alloy melting situation. If the melting is not sufficient, press the +Temp button and add further heat to melt the alloy.

Casting Rings

Place the invested casting ring with former side facing down and fit the ring in one of the circles on the steel plate and position the former side to cover the crucible opening. If not in place, this may cause mis-casting.

Casting

When the casting ring is set in place, press down the locking arm to close the chamber lid. And then choose which pressure you will undertake (air or argon) and press the Cast button to start the casting process.

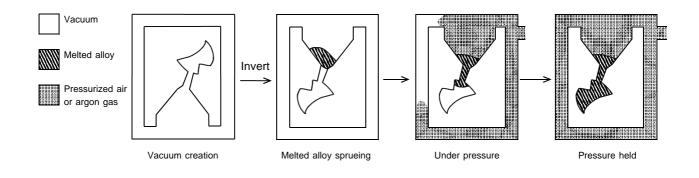
When the unit is in the argon flow melting mode before you place a casting ring, the nozzle will disturb you in placing the ring. Press the Cast button prior to setting casting ring and the nozzle will retract automatically to allow you to start casting upon closing the chamber lid.

Casting proceeds as follows.

Vacuum creation (to o	degass the mold)	Chamber Inverting (to funnel the melted alloy)	
Pressure (to cast)	Cooling (finishing)	Pressure release (to finish operation)	

Casting Technique

The concept of casting technique of this unit is based on vacuum creation, chamber inverting and pressure applying to cast melted alloy as shown in the sketches below



Casting Cycle Finish

When the cooling process comes to its end, the chamber reverts automatically to its original position. Unlock the locking arm to open the chamber lid and remove the casting ring as well as the crucible. When casting is finished power off the unit. If you have further schedule to cast, we recommend you to set crucible and proceed with casting.

Miscellaneous

Precautions for Ceramic Crucible

We recommend you to check the casting cycles of ceramic crucible with the unit and it is advisable to check visually any sign of cracks on the crucible surface before you use it.

Reference Programs (Examples)

Recommendable Casting Programs by Alloy Types (Manual Program)

We have chosen some of the leading alloys now on the market and offer you the guidelines of casting programs as follows for your references. Your customization to fit your requirements is recommendable.

Precious and Semi-Precious Alloys

										PROGRAM ITEMS					
ALLOYS	MAKER · DESCRIPTIONS		Au	Pt	Pd	Ag	Cu	OTHERS	LIQUIDUS	START	MELT	MELT	CAST	COOLING	CRUCIBLE
				(%)	(%)	(%)	(%)	(%)	TEMP	TEMP	TEMP	TIME	TIMING	TIME	
									°F()	°F()	°F()	(min.sec.)	(sec.)	(min.sec.)	
	СМ	20K / t4	83.3			8.0		8.7	1715(935)	1652(900)	1832(1000)	2 min.	0.3	30sec.	Carbon
		P-3	68.5	3.0	2.5	12.0		14.0	1760(960)	1580(860)	1868(1020)	3 min.	0.3	1 min.	Carbon
		MO-3	65.0	1.0	6.0	26.0		12.0	1706(930)	1652(900)	1886(1030)	3 min.	0.3	1 min.	Carbon
	YPM	YPK-18	75.0		2.0	7.0	15.0	1.0	1688(920)	1652(900)	1760(960)	3 min.	0.3	1 min.	Carbon
		YPK-16	66.7		3.0	10.0	18.8	1.5	1670(910)	1490(810)	1778(970)	3 min.	0.3	1 min.	Carbon
	Ishifuku	18K	75.0			8.8	14.0		1616(880)	1652(900)	1769(965)	3 min.	0.3	1 min.	Carbon
		PGA3	70.0	6.0		4.8	19.0		1760(960)	1652(900)	1868(1020)	3 min.	0.3	1 min.	Carbon
Au Alloy	Degussa	Deguroll M	70.0	4.4	2.0	13.5	8.8	1.3	1778(970)	1688(920)	1904(1040)	3 min.	0.3	1 min.	Carbon
	GC	Casting Gold Type1	83.0			10.0	7.0		1796(980)	1742(950)	1992(1050)	2min.30sec.	0.3	2 min.	Carbon
		Casting Gold Type2	76.0		2.0	8.0	14.0		1700(927)	1706(930)	1850(1010)	3 min.	0.3	1 min.	Carbon
	Heraeus	Maingold SG	71.0	2.0	2.0	12.3	12.2		1706(930)	1652(900)	1814(990)	3 min.	0.3	1 min.	Carbon
		Bio Maingold SG	71.0	3.9		12.3	12.2	0.6	1688(920)	1652(900)	1796(980)	3 min.	0.3	1 min.	Carbon
		20K	83.5			5.0			1715(935)	1652(900)	1877(1025)	3 min.	0.3	1 min.	Carbon
		18K	75.0			7.5			1652(900)	1652(900)	1814(990)	3 min.	0.3	1 min.	Carbon
		16K	66.0			10.0			1670(910)	1652(900)	1796(980)	3min.30sec.	0.3	1 min.	Carbon
	Ishifuku	Туре3	74.0	3.0	2.0	10.0	9.9		1733(945)	1652(900)	1850(1010)	3 min.	0.3	1 min.	Carbon
		PGA-21	77.0	1.0	3.0	9.0	9.5		1760(960)	1562(850)	1992(1050)	3 min.	0.3	1 min.	Carbon
	YPM	RIGID GOLD	56.0	2.5	2.0	25.3			1688(920)	1652(900)	1814(990)	3 min.	0.3	1 min.	Carbon
Pt Alloy		Benefit G	70.0	4.5	2.0	13.6			1778(970)	1598(870)	1886(1030)	3 min.	0.3	1 min.	Carbon
	Hermans	Brilliant G	68.5	3.0	3.5	10.5			1760(960)	1652(900)	1868(1020)	3 min.	0.3	1 min.	Carbon
	Tokuriki	GP Ace 330	67.0	4.0	3.0	12.0	12.0		1742(950)	1652(900)	1850(1010)	3 min.	0.3	1 min.	Carbon
	СМ	DG-V08	73.8	9.0		9.2	4.4	3.6	1814(990)	1652(900)	1940(1060)	3 min.	0.3	1 min.	Carbon

											PROGRAM ITEMS					
ALLOYS	MAKER · DESCRIPTIONS		Au	Pt	Pd	Ag	Cu	OTHERS	LIQUIDUS	START	MELT	MELT	CAST	COOLING	CRUCIBLE	
			(%)	(%)	(%)	(%)	(%)	(%)	TEMP	TEMP	TEMP	TIME	TIMING	TIME		
									°F()	°F()	°F()	(min.)	(sec.)	(min.)		
	GC	Cast• Well							1706(930)	1652(900)	1832(1000)	3 min.	0.3	1 min.	Carbon	
	Morita	New Au Pd								1652(900)	1850(1010)	3 min.	0.3	1 min.	Carbon	
Au Ag Pd	YPM	Pd Z12	12.0		20.0	50.0	16.0	2.0	1724(940)	1652(900)	1859(1015)	3 min.	0.3	1 min.	Carbon	
Alloy	Pana Heraeus	Super Cast	12.0		20.0	51.5	15.0	1.5	1814(990)	1652(900)	1922(1050)	3 min.	0.3	1 min.	Carbon	
	Ishifuku	Au Pd E12	12.0		20.0	57.4	6.5		1904(1040)	1832(1000)	1994(1090)	3 min.	0.3	1 min.	Carbon	
	Tokuriki	Au Pd Ace12	12.0		20.0	48.0	17.0		1760(960)	1652(900)	1886(1030)	3 min.	0.3	1 min.	Carbon	
	GC	Miro Silver								1022(550)	1148(620)	3 min.	0.3	3 min.	Carbon	
Ag Alloy		Miro								1112(600)	1400(760)	3 min.	0.3	3 min.	Carbon	
		Miro Bright				73.0		27.0	1211(650)	1202(650)	1292(700)	3 min.	0.3	3 min.	Carbon	
	Imoto	High Silver				63.0		37.0	1382(750)	1202(650)	1526(830)	3 min.	0.3	3 min.	Carbon	
	Ishifuku	Alloy Silver				70.0			1292(700)	1112(600)	1382(750)	3 min.	0.3	3 min.	Carbon	
	СМ	E-R	81.0	11.8	2.0	3.2		2.0	2201(1205)	2012(1100)	2417(1325)	2 min.	0.2	1 min.	Carbon	
		E-I	85.5	10.0	1.0	0.5		3.0	2102(1150)	1922(1050)	2300(1260)	3 min.	0.2	1 min.	Carbon	
	Degussa	Degudent Universal	77.3	9.8	8.9	1.2		2.8	2300(1260)	2012(1100)	2516(1380)	3 min.	0.2	1 min.	Carbon	
		Degudent G	86.0	10.3				3.7	2084(1140)	1922(1050)	2300(1260)	3 min.	0.2	1 min.	Carbon	
Porcelain	Heraeus	HERDOR H	78.5	10.0	7.8			3.7	2192(1200)	1922(1050)	2516(1380)	3 min.	0.2	1 min.	Carbon	
bonding		HERDOR EX	86.7	11.1				2.2	2057(1125)	1922(1050)	2426(1330)	3 min.	0.2	1 min.	Carbon	
precious	Ishifuku	кік	85.5	4.0	8.0	0.5			2192(1200)	1922(1050)	2408(1320)	3 min.	0.2	1 min.	Carbon	
alloy		KIK Hard 2	72.0	13.0	9.7	2.8			2354(1290)	2102(1150)	2570(1410)	3 min.	0.2	1 min.	Carbon	
	Shofu	Ceramic Gold	77.2	9.0	10.0				2291(1255)	2012(1100)	2552(1400)	3 min.	0.2	1 min.	Carbon	
		Unigold Yelow	88.7	8.0		0.5			1976(1080)	1922(1050)	2165(1185)	3 min.	0.2	1 min.	Carbon	
	YPM	Excellent 95	85.0	10.0	1.2			0.9	2129(1165)	2012(1100)	2300(1260)	3 min.	0.2	1 min.	Carbon	
		Crystal SG	76.0	5.0	10.5	5.8			2219(1215)	1922(1050)	2444(1340)	3 min.	0.2	1 min.	Carbon	

Precious and Semi-Precious Alloys

							PROGRAM ITEMS								
ALLOYS	MAKER	MAKER · DESCRIPTIONS		Pt (%)	Pd (%)	Ag (%)	Cu (%)	OTHERS (%)	LIQUIDUS TEMP	START TEMP	MELT TEMP	MELT TIME	CAST TIMING	COOLING TIME	CRUCIBLE
									°F()	°F()	°F()	(min.)	(sec.)	(min.)	
	СМ	E-E	50.0	1.0	25.0	19.0		5.0	2282(1250)	2012(1100)	2516(1380)	3 min.	0.2	1 min.	Carbon
		E-E2	33.0		42.0	18.0		7.0	2426(1330)	2156(1180)	2642(1450)	3 min.	0.2	1 min.	Carbon
Porcelain	Heraeus	HERA Bond	51.5		26.5	18.0			2246(1230)	2012(1100)	2462(1350)	3 min.	0.2	1 min.	Carbon
bonding		HERA Bond	39.0	1.0	35.0	19.0			2282(1250)	2048(1120)	2516(1380)	3 min.	0.2	1 min.	Carbon
semi-	Degussa	Degupearl G	4.5		77.3	7.2		11.0	2363(1295)	2192(1200)	2507(1375)	3 min.	0.2	1 min.	Ceramic
precious	Noritake	S-40	37.0	.0 3.0 39.0 12.0	5.0	2264(1240)	2264(1240)	2624(1440)	3 min.	0.2	1 min.	Carbon			
alloy	YPM	Quintes 52	52.0		28.0	15.0			2273(1245)	2192(1200)	2489(1365)	3 min.	0.2	1 min.	Carbon
		Ocean 52	52.0		38.0			8.0	2291(1255)	2291(1255)	2507(1375)	3 min.	0.2	1 min.	Carbon
	Ney	Eclips	52.0		38.0				2307(1264)	2307(1264)	2397(1314)	3 min.	0.2	1 min.	Carbon
	Ishifuku	KIK WING			81.0			9.0	2354(1290)	2192(1200)	2642(1450)	3 min.	0.2	1 min.	Ceramic
	Heamans	Revolution	6.0		75.0	6.5			2390(1310)	2192(1200)	2678(1470)	3 min.	0.2	1 min.	Ceramic
		Ceramic Double							2354(1290)	2354(1290)	2624(1440)	3 min.	0.2	1 min.	Ceramic
Porcelain	Daiwan									2012(1100)	2642(1450)	3 min.	0.2	1 min.	Ceramic
bonding	Heraeus	Albabond E	1.6		78.0				2228(1220)	2192(1200)	2642(1450)	3 min.	0.2	1 min.	Ceramic
Pd alloy	YPM	Status			60.5	27.5		6.0	2300(1260)	2246(1230)	2552(1400)	3 min.	0.2	1 min.	Ceramic
		Glory L	12.5		73.3			6.5	2318(1270)	2192(1200)	2642(1450)	3 min.	0.2	1 min.	Ceramic
	Shofu	Aurora			81.9		8.0	7.0	2282(1250)	2192(1200)	2498(1370)	3 min.	0.2	1 min.	Ceramic
		Aurora 12	12.0		74.4			6.5	2300(1260)	2210(1210)	2516(1380)	3 min.	0.2	1 min.	Ceramic

Precious and Semi-Precious Alloys

Non-Precious Alloys

ALLOYS	ALLOYS MAKER · DESCRIPTION			Со	Cr	Cu	OTHERS	START	MELT	MELT	CAST	COOLING	CRUCIBLE
			(%)	(%)	(%)	(%)	(%)	TEMP	TEMP	TIME	TIMING	TIME	
								°F()	°F()	(min.sec.)	(sec.)	(min.sec.)	
	Hi-Dental	HILLIUM	72.8		4.9	12.3	10.0	2192(1200)	2588(1420)	3 min.	0.2	1 min.	Ceramic
Ni-Cr		HI-CHROMSOFT-7	72.8		4.9	12.3	10.0	2192(1200)	2588(1420)	3 min.	0.2	1 min.	Ceramic
		COLLONBIUM 1	68.1		22.0		3.4	2282(1250)	2642(1450)	3 min.	0.2	1 min.	Ceramic
		COLLONBIUM 2	62.8		19.1		11.0	2192(1200)	2642(1450)	3 min.	0.2	1 min.	Ceramic
	Denken	CACOLLY-C		63.0	28.0		4.0	2192(1200)	2660(1460)	4 min.	-0.3	1 min.	Ceramic
	Hi-Dental	HI-COBALT		64.1	24.4		6.5	2372(1300)	2732(1500)	6 min.	-0.3	1 min.	Ceramic
	BEGO	WIRONIT EX HARD		63.0	30.0		2.0	2282(1250)	2642(1450)	7 min.	-0.3	1 min.	Ceramic
Co-Cr	Imoto	HI-COBALT-7						2282(1250)	2660(1460)	7 min.	-0.3	1 min.	Ceramic
		HI-COBALT-TITAN						2282(1250)	2660(1460)	7 min.	-0.3	1 min.	Ceramic
	Shofu	COBALTAN		63.0	29.0		2.0	2282(1250)	2696(1480)	7 min.	-0.3	1 min.	Ceramic
	Dentaurum	REMANIUM 800						2282(1250)	2696(1480)	7 min.	-0.3	1 min.	Ceramic

When you melt non-precious alloys ;

When you cast Ni-Cr alloy, it is advisable to use flux to facilitate spruing of the alloy.

Drop a tablet of flux into a crucible prior to inserting alloy ingots and we recommend you to use the flux,

SF-50, provided by us.

Casting program for Platinum Plate ;

The following program is recommendable for casting a platinum plate over 40g (1.4 Oz.).

Start Temp : 90 °F (50) lower than the liquidus temperature

Melt Temp : 252 °F (140) higher than the liquidus temperature

Melt Time : 4 minutes

Cast Timing : 0.3 seconds

Cooling Time : 1min/10g (0.35 Oz.)

We also recommend you to use a quartz glass stirrer for mixing alloy to make certain of the alloy melting situation. If you feel any resistance when mixing, the melting is not sufficient. We recommend you to increase temperature or make the hold time longer until you make sure of the melting fluidity.