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## Alloys

V-Deltaloy, V-Delta Special, V-Delta SF, Esteticor<sup>®</sup> Economic, Esteticor<sup>®</sup> Plus, Esteticor<sup>®</sup> Accurate 40, Esteticor<sup>®</sup> Implant 58

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# Instructions for Use Alloys

## V-Deltaloy, V-Delta Special, V-Delta SF, Esteticor® Economic, Esteticor® Plus, Esteticor® Accurate 40, Esteticor® Implant 58

### 1 Scope of application of Instructions for Use

These Instructions for Use apply to the products listed under Section 29. The issuing of these Instructions for Use renders all previous versions invalid. The manufacturer rejects any liability for damages resulting from non-compliance with these Instructions for Use.

### 2 Trade name

See Section 29.

### 3 Intended use

The products are intended for prosthetic restorations and to support procedures in the dental clinic or laboratory.

### 4 Expected clinical benefit

Restoration of chewing function and improved aesthetics.

The Summary of Safety and Clinical Performance, SSCP for the implantable devices covered by these Instructions for Use, is available on our website and accessible at this address: [www.cmsa.ch/docs](http://www.cmsa.ch/docs).

### 5 Product description

Alloys with a high precious metal content (Type 4 according to ISO 22674) have a fine-grained, homogeneous cast structure and good corrosion resistance and biocompatibility when processed as specified. They are suitable for bridge work with short and large spans as well as for milling and combined works, can be soldered before and after firing and are also suitable for casting onto prefabricated construction elements. Intended use: Fixed and removable dentures.

### 6 Indications

Alloys						
	a	b	c	d	e	f
V-Deltaloy						
V-Delta Special		■	■	■	■	
V-Delta SF		■	■	■	■	
Esteticor® Economic		■	■	■	■	
Esteticor® Plus		■	■	■	■	
Esteticor® Accurate 40		■	■	■	■	■
Esteticor® Implant 58		■	■	■	■	

a Inlays, onlays, crowns ¾  
 b Single crowns  
 c Short-span bridgework  
 d Long-span bridgework  
 e Milled work  
 f Clasps, lingual bars, palatal plates

### 7 Contraindications

- Patients who are unable to keep the regularly required check-up appointments for health reasons.
- Patients with bruxism or other para-functional habits.
- Patients with allergies to materials used in the product, see Section 19.
- Existing clinical picture in the patient's mouth does not permit the correct application of the products.

### 8 Compatible products

#### Solders and Laser welding wire

Alloys	Solders			Laser welding wire
	Pre-Solder		Post Solder	
V-Deltaloy	S.W 1100	S.G 1080	S.G 750	LW N° 3
V-Delta Special	S.W 1100		S.G 750	LW N° 3
V-Delta SF	S.W 1125	S.G 1120	S.G 750	LW N° 3
Esteticor® Economic	S.W 1100		S.G 810 S.G 750	LW N° 2
Esteticor® Plus	S.W 1100		S.G 810 S.G 750	LW N° 2
Esteticor® Accurate 40	S.W 1125		S.G 750	LW N° 2
Esteticor® Implant 58	S.G 1055	S.G 1030	S.G 750	LW N° 3

To fabricate the finished denture, a number of general laboratory supplies are required in addition to the products listed under Section 29. The following gives a selection of materials that Cendres+Métaux SA offers in its portfolio.

08052138	Polyurock Kit	08055014	Livento® invest Powder (50 x 100 g)
08052135	Polyurock Catalyst	083739	Livento® invest Liquid (1000 ml)
08052137	Polyurock Mixer	08052160	uniVest® Plus Powder (30 x 150 g)
08052149	ABF Wax Universal	08052161	uniVest® Plus Liquid (1000 ml)
08052150	ABF Wax Creativ light	08052162	uniVest® Rapid Powder (30 x 150 g)
08052151	ABF Wax Creativ dark	08052163	uniVest® Rapid Liquid (1000 ml)
08052154	ABF Wax Special	080181	CM soldering investment (4 kg)
08052148	ABF Wax Margin	080229	CM soldering paste
08052153	ABF Wax Position	08052307	Legabril Diamond (50 g)
08052152	ABF Wax Tecno		

## 9 Qualification of the specialist

Expertise in professional dentistry and dental technology is assumed. The current Instructions for Use must be available at all times and be completely read and understood before the first application. The fabrication of dentures and their maintenance may only be performed by qualified specialists.

 Important information for the specialist

 Warning symbol for increased caution

## 10 Prescription

Federal laws in the USA prohibit the use by or sale to unlicensed dentists.

## 11 Side effects

 This product must not be used in patients with allergies or suspected allergies to materials used in the product (see Section 19), or only after prior allergological clarification.

Auxiliary instruments may contain nickel.

If applied as intended, side effects can be excluded.

## 12 Warnings

 **Magnetic resonance (MR) environment**  
The device has not been evaluated for safety and compatibility in the MR environment.  
The product has not been tested for heating or migration in the MR environment.

## 13 General information

N/A

## 14 Preventive measures

- Mixing of different alloys or alloys of similar types is not allowed!
- Wear darkened eye protection and protective gloves when melting.
- Protect eyes, hands and breathing when pickling.

 – The product components are supplied non-sterile. For more information see Section 16 "Reprocessing".  
– For your own safety, always wear suitable protective clothing. In particular when grinding, we recommend wearing protective goggles and a dust mask as well as the use of a suction unit.

## 15 Single use

Products that are intended for single use and are labelled "single-use" accordingly are subject to a certain amount of stress, increased wear, and even loss of functionality during their use.

 Multiple application of products labelled «single use» was not tested. This can impair the safety, function and performance of the products as well as increase the risk of transmitting infections.

## 16 Reprocessing

 The prosthetic work, including all system components, must be cleaned, disinfected and, if appropriate, sterilised prior to each work step. Materials made of metal alloys, high-performance polymers (Pekkton®) and ceramics are suitable for steam sterilisation. With the exception of Pekkton®, components made of plastics are not suitable for steam sterilisation. Consider published national guidelines when selecting a disinfection and sterilisation process and the Instructions for Use "Reprocessing of surgical and prosthetic products" ([www.cmsa.ch/docs](http://www.cmsa.ch/docs)).

## 17 Scope of application

Fixed and removable dentures.

## 18 Procedure

### 18.1 Modelling

Usual modelling technique for ceramic-fused-to-metal works. Minimal wall thickness 0.4 mm. With bridgework the connections must have a minimum section of 6–9 mm<sup>2</sup>. Modelling of garlands or inlay shaped reinforcements in the palatal region will give added stability. The application of air and cooling vents improves casting results.

**18.2 Spruing**

Wax sprues of no less than Ø 3.5mm are required. Direct (Ø 3.5mm) and cross bar (Ø 5mm) spruing produce excellent results. Feeder sprues to heavy pontics should be of at least Ø 4mm.  
Air vents (Ø 1mm) may be used to advantage. Wax patterns should be set outside the thermal centre, i.e. near the casting ring wall and about 5mm from the end. For individual copings and small bridges (up to three units), use of the circular sprue provides ideal positioning of the wax patterns and ensure controlled solidification of the frameworks.

**18.3 Investing**

When using steel casting rings always use refractory liner in order to allow free expansion of the investment.

The following investment materials from Cendres+Métaux are suitable for this alloy type:

uniVest Plus: universal phosphate-bonded, graphite- and gypsum-free investment material

uniVest Rapid: graphite-free, phosphate-bonded investment material

Livento® invest: Special investment material for lithium disilicate and other pressable ceramics. Fabrication of refractory stumps. Metal casting technique.



Plaster-based investments must not be used for these types of alloys!



Rapid preheating technique: the use of burn-out plastic parts can lead to spalling in the investment material.

**18.4 Preheating**

Observe manufacturer's recommendations with regard to setting times, temperature levels etc. On reaching the end temperature a soaking period of 20 to 45 min. is advisable depending on the size of the cylinder.

Alloys			
	Preheating °C	Crucible	Casting temperature °C
V-Deltaloy	850	②	1450
V-Delta Special	850	②	1450
V-Delta SF	850	②	1450
Esteticor® Economic	850	② ③	1390–1420
Esteticor® Plus	850	② ③	1430–1460
Esteticor® Accurate 40	850	② ③	1400–1450
Esteticor® Implant 58	850	② ③	1405–1455

① = Graphite crucible

② = Universal ceramic crucible

③ = Vitrified carbon crucible



**Re-use of alloy**

Only use perfectly cleaned (by sand-blasting with aluminium oxide) buttons and sprues and add at least 1/3 of new alloy.

**18.5 Melting**

It is important, when using a torch for melting that the recommended propane (approx. 0.5 bar or 7.25 psi) / oxygen (approx. 1.0 bar or 14.5 psi) mixture and pressure are observed. Before melting add a pinch of flux to the alloy.

Flux: boric acid

**Recommended casting systems (not compulsory)**

Alloys					
	Propane-oxygen flame	Vacuum-pressure casting with electric resistance furnace	Centrifugal casting with electric resistance furnace	High frequency induction in atmosphere	High frequency induction in protective gas atmosphere
	Post-melting time 5–10 s	Post-melting time 40–60 s	Post-melting time 40–60 s	Post-melting time 5–10 s	Post-melting time 5–10 s
V-Deltaloy	✓	✓	✓	✓	✓
V-Delta Special	✓	✓	✓	✓	✓
V-Delta SF	✓	✓	✓	✓	✓
Esteticor® Economic	✓	✓	✓	✓	✓
Esteticor® Plus	✓	✓	✓	✓	✓
Esteticor® Accurate 40	✓	✓	✓	✓	✓
Esteticor® Implant 58	✓	✓	✓	✓	✓

**Thermal treatment**

Alloys				
	Thermal treatment of the framework before surface treatment (not compulsory)	Annealing	Hardening	Trimming of the framework surface with ceramically bonded grinding stones
V-Deltaloy		900 °C / 15 min / H <sub>2</sub> O	600 °C / 15 min / air*	✓
V-Delta Special		900 °C / 15 min / H <sub>2</sub> O	600 °C / 15 min / air*	✓
V-Delta SF		900 °C / 15 min / H <sub>2</sub> O	600 °C / 15 min / air*	✓
Esteticor® Economic	950 °C / 10 min			✓
Esteticor® Plus	950 °C / 10 min			✓
Esteticor® Accurate 40				✓
Esteticor® Implant 58	600 °C / 15 min			✓

\* Annealing before hardening

\*\* If firing/soldering < 820 °C



**Surface quality of cast objects**

In order to prevent corrosion the cast object must have a surface free of shrink holes and porosities after trimming and polishing.

**18.6 Cooling of castings**

Do not quench the casting cylinder after casting, but bench cool to room temperature.

**18.7 Finishing**

Trim the framework first preferably using carbide burs and then fine grinding points at low speed.

Alloys	Sandblasting with non-recycled aluminium oxide (Al <sub>2</sub> O <sub>3</sub> ) 50 µm	Cleaning with steam jet	Oxide firing		Pickling after oxide firing in a warm and clean solution of 10 vol.% sulphuric acid (H <sub>2</sub> SO <sub>4</sub> )	Sandblasting after oxide firing with non recycled aluminium oxide (Al <sub>2</sub> O <sub>3</sub> ) 50 µm
			with vacuum	without vacuum		
V-Deltaloy	✓	✓		950 °C / 10 min		
V-Delta Special	✓	✓		950 °C / 10 min		
V-Delta SF	✓	✓		950 °C / 10 min		
Esteticor® Economic	✓	✓		960 °C / 5 min		✓
Esteticor® Plus	✓	✓		960 °C / 5 min		✓
Esteticor® Accurate 40	✓	✓		960 °C / 5 min		✓
Esteticor® Implant 58	✓	✓		900 °C / 10 min		✓

**18.8 Soldering**

We recommend using a propane/oxygen torch for soldering and a flux like CM soldering paste. During soldering wear dark goggles for protection. The design of the soldering block is a compromise between minimising its thermal mass whilst retaining sufficient strength to avoid its fracturing during soldering. Leave a parallel gap of 0.1–0.2mm between surfaces to be soldered and sufficient area to ensure adequate strength of the joint.

**18.9 Pickling**

After firing or soldering pickle in a warm, freshly prepared (clean) solution of 10 vol. % sulphuric acid (H<sub>2</sub>SO<sub>4</sub>)

 When using other pickling agents follow the instructions for use of the respective manufacturer.

**18.10 Thermal treatments (not compulsory)**

After casting, some of the high gold metal alloys have not yet obtained their maximal mechanical properties. For long-span bridgework and for works with attachments in combustible plastic which will not be veneered with ceramic, a simulation firing of the work in the as cast condition (cleaned frameworks, sprues not yet removed) in the ceramic furnace can be done.

This procedure has the following advantages: The hardness increase allows easier and faster trimming of the frameworks. Grinding overlaps are prevented. Possible tensions due to the casting process are reduced.

**18.11 Gilding of frameworks**

Gilding is carried out at the user's own risk.

**18.12 Polishing**

After the last firing free metal surfaces must be polished to a high shine in order to completely remove the oxide layer.

**18.13 Ceramic veneer: cooling cycle after firing**

Alloys	Heating rate max.	Ceramics < 900 °C			Ceramics > 900 °C		
		Long-term	Normal	Rapid	Long-term	Normal	Rapid
V-Deltaloy			■		■	■	
V-Delta Special			■	■	■	■	
V-Delta SF			■	■		■	■
Esteticor® Economic		■	■		■	■	
Esteticor® Plus			■			■	
Esteticor® Accurate 40			■			■	
Esteticor® Implant 58			■			■	

Not binding, please also observe the instructions of the ceramic manufacturer!

**19 Materials**

**19.1 Composition %**

Alloys	Au + Pt group metals	Au	Pt	Pd	Ag	Cu	Sn	Zn	In	Ga	Ir	Ru	Rh	Fe	Others
V-Deltaloy	85.28	54.20		31.04	4.83				8.99	0.90	0.01	0.03			
V-Delta Special	78.10	52.50		25.54	17.00	0.20	3.50	0.20	1.00		0.02	0.04			
V-Delta SF	90.00	51.50		38.40					8.50	1.50		0.10			
Esteticor® Economic	75.50	50.00	0.45	25.00	19.00		1.00	1.00	3.50		0.05				
Esteticor® Plus	84.10	45.00		38.90	5.00	0.40	0.50		8.60	1.40		0.20			
Esteticor® Accurate 40	77.00	40.00		36.80	13.30				9.50	0.20		0.20			
Esteticor® Implant 58	87.50	58.50		28.85	8.00		4.50				0.05	0.10			

## 19.2 Physical properties

Alloys	CTE   10 <sup>-6</sup> K <sup>-1</sup>		Density	Melting range	Young's Modulus
	(25–500 °C)	(25–600 °C)			
			g/cm <sup>3</sup>	(°C)	GPa
V-Delta <sup>loy</sup>	14.1	14.3	14.7	1115–1295	125
V-Delta Special	14.7	14.9	14.4	1155–1265	115
V-Delta SF	13.6	13.9	14.5	1210–1310	115
Esteticor <sup>®</sup> Economic	14.8	15.1	14.0	1145–1255	120
Esteticor <sup>®</sup> Plus	13.9	14.2	13.8	1115–1285	135
Esteticor <sup>®</sup> Accurate 40	14.1	14.4	13.6	1210–1295	125
Esteticor <sup>®</sup> Implant 58	13.9	14.0	15.1	1215–1305	120

## 19.3 Mechanical properties

Alloys	Hardness HV5		Proof stress Rp 0.2%		Tensile strength (Rm)		Elongation A5	
	As cast	After firing	MPa		MPa		%	
			As cast	After firing	As cast	After firing	As cast	After firing
V-Delta <sup>loy</sup>	250	255		635		865		9
V-Delta Special	205	250		510		705		7
V-Delta SF	225	245		525		790		25
Esteticor <sup>®</sup> Economic	205	235		535		750		15
Esteticor <sup>®</sup> Plus	235	260		580		865		23
Esteticor <sup>®</sup> Accurate 40	235	245		490		715		15
Esteticor <sup>®</sup> Implant 58	240	260		610		820		13

More detailed information on the materials as well as their compositions can be found in the product-specific material data sheets, the product information as well as the product list compiled in Section 29. All relevant documents can be found on the website [www.cmsa.ch/docs](http://www.cmsa.ch/docs) by entering the relevant product name.

## 20 Notes on storage



Insofar as no specific information on storage is given on the packaging of the product, we recommend storing the product in its original packaging, in a dry place, at room temperature and without direct sunlight. Improper storage can influence the product properties and lead to failure of the restoration.

## 21 Patient information

On the day of insertion of the dentures at the latest, the patient must be informed that regular follow-up care is necessary to maintain the health of the entire masticatory system and the functionality of the denture. Ensure that the patients are motivated and instructed with regard to caring for their teeth as well as dentures.

Permanent and removable dentures are subject to considerable stress. Signs of wear are normal and cannot be avoided, only reduced. The amount of wear depends on the overall system.

## 22 Ordering information

The information relevant to your order can be found in the product list in Section 29 of this document. The product information is also helpful. This and other relevant documents can be found on the website [www.cmsa.ch/docs](http://www.cmsa.ch/docs) by entering the relevant product name.

## 23 Availability

Some of the products described in this document may possibly not be available in all countries.

## 24 Traceability of the lot number

The lot numbers of all parts used must be documented to ensure traceability.

## 25 Complaint

Cendres+Métaux SA must be notified immediately of any incident that has occurred with regard to the product. To do this, please contact your customer advisor or send us your message by e-mail to the address [complaints-cmbrand@cmsa.ch](mailto:complaints-cmbrand@cmsa.ch). In serious cases, also send a report to the competent authority where you are domiciled.

## 26 Safe disposal

The products must be disposed of in accordance with local laws and environmental regulations, taking into account the level of contamination. Cendres+Métaux Lux SA would be very pleased to accept precious metal waste. For information and additional details, please contact your Cendres+Métaux SA representative.

## 27 Trademarks

Registered trademarks of Cendres+Métaux Holding SA, Biel/Bienne, Switzerland include:

Esteticor<sup>®</sup> and Livento<sup>®</sup>.

Unless explained specifically, all products marked with "®" are not registered trademarks of Cendres+Métaux Holding SA, but registered trademarks of the respective manufacturer.

**28 Disclaimer**

The manufacturer rejects any liability for damages resulting from non-compliance with these Instructions for Use. Cendres+Métaux SA products are parts of an overall concept and may only be used or combined with the appropriate original components and instruments. Otherwise, the manufacturer rejects any responsibility and liability. In case of complaints, please always include the lot number.

The use of third party products not distributed by Cendres+Métaux SA in connection with the products mentioned in the product list in Section 29 will void any warranty or other express or implied obligation of Cendres+Métaux SA.

Responsibility regarding the suitability of a product for the specific patient case is at the discretion of the specialist.

Cendres+Métaux SA disclaims any express or implied liability and shall not be responsible for any direct, indirect, punitive or other damages arising from or in connection with errors in professional judgement or practice in the use of Cendres+Métaux SA products.

The specialist is obliged to regularly study the latest developments of the products mentioned in the product list in Section 29 and their applications.

It should be noted that the descriptions contained in this document are not sufficient for the immediate application of Cendres+Métaux SA products. Expertise in dentistry, dental technology and instructions by an experienced specialist in the use of the products mentioned in the product list under Section 29 is always necessary.

In case of inconsistencies in translations, the English language version shall prevail.

**29 Product list**

Cat. No.	Packing (gram)	Product name (Material)	Single use	Labelling	UDI-DI	Basic UDI-DI
01000200	10		No	CE 0483	97640173080810	764016651000040DT
01000201	25	V-Deltaloy	No	CE 0483	97640173080827	764016651000040DT
01000202	31.1		No	CE 0483	97640173080834	764016651000040DT
01000195	10		No	CE 0483	97640173080766	764016651000040DT
01000196	25		No	CE 0483	97640173080773	764016651000040DT
01000197	10.0	V-Delta Special	No	CE 0483	97640173080780	764016651000040DT
01000198	30.0		No	CE 0483	97640173080797	764016651000040DT
01000199	31.1		No	CE 0483	97640173080803	764016651000040DT
01000203	10		No	CE 0483	97640173080841	764016651000040DT
01000204	25	V-Delta SF	No	CE 0483	97640173080858	764016651000040DT
01000205	31.1		No	CE 0483	97640173080865	764016651000040DT
01000239	10		No	CE 0483	97640173081206	764016651000040DT
01000240	25	Estetitor® Economic	No	CE 0483	97640173081213	764016651000040DT
01000241	10.0		No	CE 0483	97640173081220	764016651000040DT
01000242	30.0		No	CE 0483	97640173081237	764016651000040DT
01000179	10		No	CE 0483	97640173080605	764016651000040DT
01000180	25		No	CE 0483	97640173080612	764016651000040DT
01000181	10.0	Estetitor® Plus	No	CE 0483	97640173080629	764016651000040DT
01000182	30.0		No	CE 0483	97640173080636	764016651000040DT
01000183	31.1		No	CE 0483	97640173080643	764016651000040DT
01000273	10		No	CE 0483	97640173081541	764016651000040DT
01000274	25	Estetitor® Accurate 40	No	CE 0483	97640173081558	764016651000040DT
01000275	31.1		No	CE 0483	97640173081565	764016651000040DT
01000228	10		No	CE 0483	97640173081091	764016651000040DT
01000229	25		No	CE 0483	97640173081107	764016651000040DT
01000230	10.0	Estetitor® Implant 58	No	CE 0483	97640173081114	764016651000040DT
01000231	30.0		No	CE 0483	97640173081121	764016651000040DT
01000232	31.1		No	CE 0483	97640173081138	764016651000040DT

## 30 Labelling on packaging/symbols

	Date of manufacture
	Manufacturer
	Catalogue number
	Lot number
	Quantity
 www.cmsa.ch/docs	Observe the Instructions for Use, which are available in electronic form at the address specified.
Rx only	Attention: According to US federal law, this product may only be sold by or on behalf of a physician.
 	Cendres+Métaux products with CE labelling meet the requirements of the relevant European requirements.
	Do not re-use
	Non-sterile
	Protect from sunlight
	Attention, observe accompanying documents
 	Clear product identification
	European Authorised Representative
	Importer
	Medical device