

Product Information
On

Cavex Avalloy
Silver Alloy for Dental Amalgam

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1. Introduction

Cavex Avalloy is a modern lathe-cut high-copper alloy. The copper content is substantially higher than that of conventional alloys and the silver content is lower.

The composition chosen means, that Cavex Avalloy belongs to the group of non gamma-2 alloys. This indicates, that with Cavex Avalloy, the comparatively stable ϵ -phase will be formed, rather than the mechanically weak and corrosion prone gamma-2 phase. This is why Cavex Avalloy excels in high mechanical strength, low creep and high corrosion resistance.

It is presented in the form of pre-dosed capsules (I-, II- and III-spill). The alloy and mercury in these capsules are mixed in an electrical mixer, to form a homogeneous mass with a smooth consistency, that can be easily condensed into the cavity. After finishing and polishing, an amalgam filling is achieved, that will resist the oral conditions for a long time.

Cavex Avalloy is in full compliance with EN ISO 24234 Dental Amalgam.

Cavex Avalloy is developed and manufactured by Cavex Holland B.V. of Haarlem, The Netherlands, a Company that is certified according to the provisions of the Regulation (EU) 2017/745 concerning Medical Devices, against ISO 9001 and ISO13485.

Cavex Avalloy bears the CE-marking of conformity.

2. Composition

The chemical composition of Cavex Avalloy is as follows:

silver	: app. 45.0 %
tin	: app. 30.5 %
copper	: app. 24.0 %
zinc	: app. 0.5 %

The recommended mixing ratio is: 10 parts of alloy to 10.3 parts of mercury. It is obvious that the composition of Cavex Avalloy deviates particularly in a much higher copper content compared with alloys of a conventional composition. This higher copper content is necessary for being a non gamma-2 alloy. Combined with the high tin content and the relatively low silver content, this means that Cavex Avalloy belongs to the group of "High Copper Single Composition" or ternary lathe-cut alloys.

3. Manufacturing

The metals are molten and mixed in a heat-resistant crucible, placed in a so-called: medium-frequency induction furnace. Compared with traditional ways of heating, this oven allows a very short melting time and thus a reduction of the possibility of oxidation. The molten alloy is transferred into a mould, resulting in an ingot after cooling. The ingot is heat-treated for recrystallization, in order to enhance the reactivity towards mercury, and then machined with a cutting-tool to produce needle-shaped particles.

4. Laboratory control

The control of Cavex Avalloy can be divided into two groups of properties:

Patient-related, or physical properties:

The following table gives typical values for the physical properties of Cavex Avalloy. When available, the corresponding requirements of the EN-ISO Specifications are mentioned.

The working time and setting time, mentioned in the table, cannot be considered as absolute values. The working time is only an indication of the maximum time available for mixing applying and condensing the amalgam. The setting time is only an indication of the moment at which the finishing of the amalgam can be started.

Characteristic	EN ISO 24234	Cavex Avalloy	
working time	–	4	min.
setting time	–	10	min.
dimensional behaviour (5 min – 24 hrs)	–0,10 +0,15	+0,01	%
static creep after 7 days/37 °C	max. 2,0	0,1	%
compressive strength after 2 hour after 24 hours	min. 100 min. 350	110 >400	MPa MPa
Corrosion resistance	>80	94	%

Dentist-related, or handling properties:

For the latter, there is in fact no official specification available. We are therefore using, already for many years, our own methods of testing the dentist-related qualities of Cavex Avalloy.

The alloy is mixed with mercury in the recommended ratio of 600 mg of alloy to 620 mg of mercury in a mechanical mixer. The resulting amalgam-mix is judged on the following points:

- amalgamation: the alloy should have a direct and sufficient reaction with mercury, the amalgam must be more than only a mixture of powder and liquid
- plasticity (or: consistency): the amalgam should form a smooth, plastic mass, but with sufficient body to allow for good condensation into the cavity
- working time: the maximum time available for manipulation and condensation is determined, in an arbitrary but reproducible way
- hardening time: the moment at which the dentist can start finishing the amalgam in the cavity is determined, in an arbitrary but reproducible way

The information that can be derived from these tests is of an arbitrary nature, has no absolute value and can therefore not be published. But, based on our experience with this type of testing for many years, and combined with the test-results according to the various specifications, it enables us to guarantee the perfect and constant quality of Cavex Avalloy from batch to batch over the years.

5. Shelf-life test

There is no specific shelf-life test described for amalgam alloys. Shelf life has never been a problem for alloys like Cavex Avalloy in view of the noble character of the silver alloy. This enables us to guarantee the good quality of Cavex Avalloy for 3 years.

6. Quality Control

A batch of Cavex Avalloy, that has passed all the tests, is released for sales. In case of one or more requirements being not in specification, that batch is withdrawn and not sold.

7. Statement of non-toxicity

We hereby declare that Cavex Avalloy can be safely used and is non-toxic to the patient as well as to the dental team.

Cavex Avalloy will also normally not be irritant to oral tissues and does not contain any hazardous ingredients in sufficient concentration to be harmful to human beings, when used as directed.

It must be emphasised, however, that Cavex Avalloy alloy has to be mixed with mercury to form an amalgam.

Mercury is known to be toxic, in particular mercury vapour, and should therefore be handled with care, maintaining appropriate hygienic measures.