Premana 19.05.2022

# Sanitisation protocol for mountaineering and work at height products for C.A.M.P. brand:

## 1. Foreword

The recent Covid-19 pandemic, brought about by the new Sars-CoV-2 virus, puts an emphasis on the value of hygiene and safety for everyone and highlights the need for C.A.M.P. to suggest adequate sanitisation procedures related to all spheres of our daily and working lives, among which are technical rescue, work at height, sport activities, retail, and equipment rental, as well.

The R&D department at C.A.M.P. SpA took immediate action with regards to analysis and tests concerning sanitisation, aiming to supply detailed information on C.A.M.P. products, with a focus on PPE (Personal Protective Equipment).

The present document, compiled together with Prof. Dr. Massimo Artorige Giubilesi, a certified technical-scientific advisor for environmental and food hygiene and safety from the Milan-based firm Giubilesi & Associati, has the purpose of describing specific and effective disinfection criteria for devices manufactured by C.A.M.P. SpA, with the aim of granting constantly high levels of functionality and safety, allowing the user to choose the most appropriate method to suit his/her needs, based upon an adequate risk analysis.

We hope that this document provides a valid contribution to personal and collective hygiene safety for all professionals and users, especially taking into account the current health crisis.

C.A.M.P. SpA remains at your disposal, should further support or assistance be required.

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**Disclaimer: the information provided in this document are not applicable in North America (USA and Canada).**

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|---|---|---|
| 19.05.2022 | Graphics revision | Rev. 1 |
| 18.05.2020 | Sanitization Protocol for C.A.M.P. SpA Products | Rev. 0 |

## 2. Disinfection procedures and SARS-CoV-2 virus.

During the analysis and tests undertaken to create the present protocol, substances and procedures [(1)] that are usually employed for sanitisation have been examined, with the aim of compiling a valid reference document to keep hygiene standards high, even at ordinary times and not only pertaining to the current Covid-19 emergency.
To date, scientific information concerning the neutralisation of the Sars-CoV-2 virus is minimal [(2)], with only a handful of publications available[(3)]; for this reason, the overall trend is to refer to known sanitisation criteria that are effective against other types of viruses, which were examined in the past [(2)(4)(5)(18)].
It is therefore advisable to compare the present document with the most up-to-date governmental [(6)(7)] and health [(8)] guidance from Italy or the relevant country [(es.9)], which is subject to constant review, based upon scientific evidence.
Hence this document is valid as per current knowledge and future modifications, additions, deletion and changes are possible according to new information becoming available.

## 3. Sanitisation: cleaning and disinfection.

It is important to specify that sanitisation is made up by two fundamental aspects [(20)]:

- Cleaning: a series of procedures and actions aimed at removing dust, unwanted material or dirt from surfaces, objects, confined spaces and areas of pertinence. This action is also undertaken with the help of suitable detergents that do not damage the material. In short, this term refers to the removal of dirt that can be organic (from food) or inorganic (from limescale). Nonetheless, the microorganisms are not affected.

- Disinfection: a series of procedures and operations capable of making certain environments and objects safe, by means of destroying or inactivating pathogenic microorganisms. Depending on specific national laws and different situations, consider the need to use certified disinfectants. If carried out following best practice, disinfection aims at controlling 99.9% of microorganisms.

**Warning**: if disinfection is carried out without having previously cleaned the item or area, proper disinfection will not occur. It is imperative that any dirt is removed first; then disinfection can take place.

**Warning**: During all stages of sanitisation, wear the appropriate PPE before handling any product (e.g. face mask, gloves, glasses) according to the necessary safety procedures.

**4. Sanitisation and lifetime of the products**

The lifetime of PPE manufactured by C.A.M.P. SpA is subject to the cleaning procedures stated on the user manual (see point 5 of the present declaration)

The lifetime of C.A.M.P. SpA safety products is as follows:

- Textile and plastic products: 12 years from the manufacture date, limited to 10 years from the date the product is first used.
- Metal products: unlimited duration.

Please refer to the product user manual and the declaration available here, to access the full information.

All the disinfection procedures examined during the analysis and tests by C.A.M.P. SpA R&D Department have proven to be more aggressive than ordinary cleaning procedures.
Although we have not detected any effects that may compromise the intrinsic safety of PPE, it is however necessary to decrease the lifetime of the products for each of the suggested disinfection procedure.

**5. Cleaning methods permitted on gear manufactured by C.A.M.P. SpA**

Common cleaning procedures are briefly stated in the user manuals and, more thoroughly, in chapter 3.3 on the publication by C.A.M.P. "Inspecting PPE".

For this reason, in the interest of sanitisation, allowed cleaning procedures are as follows:

Simple metal products (e.g. carabiners, ascenders, Goblin fall arrester)

1- Wash in lukewarm water (30°C max) with a mild detergent with a max pH 8 (e.g. Marseille soap) to be added to water in the amount recommended by the manufacturer, rinse off and dry naturally in a ventilated environment, away from direct sunlight or heat sources.

2- Alternatively, rub a damp microfiber cloth, after having applied a spray mild detergent with a max pH 8 (e.g. Marseille soap).

Complex metal products with mechanisms hidden by covers (e.g. Cobra, Giant, Druid)

- It is not possible to soak them. Rub with a damp microfiber cloth, after having applied a spray mild detergent with max pH 8 (e.g. Marseille soap)

Textile/plastic products (e.g. ropes, slings, harnesses, helmets)

1- Wash in lukewarm water (30°C max) with a mild detergent with max PH 8 (e.g. Marseille soap), added to water in the amount suggested by the manufacturer, rinse and leave to dry naturally in a ventilated environment, away from direct sunlight or heat sources. It is possible to wash by hand or in the washing machine, using a wool/delicates programme at a low spin cycle (< 400 rpm).
In case of products that entail metal components or if the need to wash simple metal products simultaneously arises, it is necessary to insert the products in a mesh bag and/or wash at full load to avoid damaging the machine.

2- Alternatively, rub with a damp microfiber cloth, after having applied a spray mild detergent with a max PH 8 (e.g. Marseille soap).

**Warning**: never mix mild detergents with other detergents.

**Warning**: do not wash at a temperature exceeding 30°C, as our tests revealed relevant resistance decrease on some types of products already above 50-60°C.

**6. Disinfection methods that are permitted on products manufactured by C.A.M.P. SpA**

**6a – Sodium hypochlorite**

Sodium hypochlorite (contained in common bleach) is an oxidising sanitizer that is effective for the general disinfection of surfaces and contact points [(1)], scientifically tested against Sars-CoV-2 [(3)] and prescribed in all the consulted documents , including the Decree of the Italian Prime Minister (DCPM) concerning Covid-19 [(2)(5)(6)(7)(8)(9)]. This is the most effective and approved solution in case of serious contaminations, for instance the ones occurring during medical aid or hospitalisation.

The maximum allowed dilution for C.A.M.P. products is 0,1% of active chlorine.
In order to obtain it with common bleach with a 5% sodium hypochlorite content [(10)], it is necessary to dilute 2% bleach in water (20 ml per litre of cold water).

Simple metal products and textile/plastic products
Soak the product in clean water at room temperature with 0,1% active chlorine for 20 minutes.

1. Rinse immediately and thoroughly under running water.
2. Leave to dry in a ventilated environment, away from direct sunlight or heat sources.

Complex metal products
This procedure cannot be applied.

The load test undertaken after several washing cycles with the examined product [(10)] have shown slight resistance reductions.
We detected a potential oxidation onset on the aluminium alloy components: following sanitisation undertaken with sodium hypochlorite, we recommend the lubrication of metal parts (a spray silicon lubricant is suggested), to protect them from the oxidising effect of hypochlorite. After lubrication, remove any residual lubricant from the products with a clean microfiber cloth.

Lifetime

If the product undergoes disinfection with sodium hypochlorite, its lifetime is thus reviewed:

- Textile and plastic products: withdraw the product from service after 30 sanitisation cycles, duly recorded on the product life sheet, or after six months from the first sanitisation cycle.
- Metal products: the lifespan remains unlimited, unless corrosion is detected.

 **Warning**: never mix sodium hypochlorite with other detergents.

 **Warning**: never use solutions with active chlorine exceeding 0.1%. In the event of contact with solutions with a higher concentration or with pure bleach, withdraw the product from service.

 **Warning**: if, following sanitisation, a variation in the consistency and/or colour of the textile/plastic elements is detected, or if corrosion of metal elements occurs, withdraw the product from service.

 **Warning**: before use, please refer to the user information and the safety sheet of the chemical.

**6b – Ethyl/isopropyl alcohol**

Ethyl alcohol is known as an effective disinfectant in an overall context, as well [1], scientifically tested against Sars-CoV-2 and prescribed in the majority of consulted documents, including the Decree of the Italian Prime Minister (DCPM) concerning Covid-19 [2][5][6][7][8].
This solution (or other ones containing isopropyl alcohol) represents an effective and fast way of quickly disinfecting all types of surfaces. Its application to all products and the speed of sanitisation make it attractive for use in the most disparate environments, for instance after rentals or gear tests.

The procedures to be implemented for all C.A.M.P. products are as follows:

Liquid alcohol (70%)
Apply on a microfiber cloth and rub the surface until fully evaporated.

Spray alcohol (70%)
Spray on the surface that needs handling and rub with a microfiber cloth until fully evaporated

The load tests carried out after several disinfection cycles with alcohol did not show substantial resistance reduction. Following the sanitisation with alcohol, it is advisable to lubricate mobile metal parts (a silicon spray lubricant is recommended) so as to reinstate its correct functionality. After lubrication, rub any residue lubricant off the product with a dry microfiber cloth.

Lifetime
If the product has undergone disinfection with alcohol-based products, its lifetime is revised as follows. Indicate the sanitisation method, its frequency and revised lifetime on its life sheet.

- Textile and plastic products: 12 years from manufacture, limited to:
  - 2 years from the first sanitisation cycle in case of daily sanitisations;
  - 5 years from the first sanitisation cycle in case of weekly sanitisations;
  - 10 years from the first sanitisation cycle in case of monthly or occasional sanitisations.

- Metal products: the lifetime remains unlimited.

 **Warning**: never mix alcohol with other detergents.

 **Warning**: If, following sanitisation, a variation in the consistency and/or colour of the textile/plastic elements is detected, withdraw the product from service.

 **Warning**: alcohol-based products are highly inflammable. Take the appropriate precautions.

 **Warning**: before use, please refer to the user information and the safety sheet of the chemical.

**6c – Hydrogen peroxide**

Hydrogen peroxide (contained in many detergents of daily use) is a biocide oxidant that releases oxygen, known for being effective in the broad-scale disinfection of surfaces and spaces. It is prescribed in some of the consulted documents concerning Covid-19, including a memo from the Italian Ministry of Health [1, 5, 7].

It is a compound valid for immersion and featuring lower aggressiveness with regards to sodium hypochlorite, especially towards plastic materials, aluminium alloys, multi-layered products.
The availability of detergents that include non-ionic and/or anionic surfactants enable us to clean and disinfect in a single washing, either by hand or with a machine (without applying the cleaning procedure described in point 5).

The maximum allowed dilution for C.A.M.P. products is 0.5% hydrogen peroxide.
The tested detergent [11] contains between 5 and 15% hydrogen peroxide, max 5% anionic surfactants and a reduced percentage of non-ionic surfactants.
Do not use detergents that contain higher percentages of the above-mentioned substances and/or other types of surfactants and /or other types of detergents.

In order to obtain a dilution of 0.5% hydrogen peroxide in water with a detergent containing 10% hydrogen peroxide, it is necessary to dilute 5% detergent in water (50 ml per litre of water).

Adopt the following procedures:

<u>Simple metal products and textile/plastic products</u>

1- Hand wash the product in clean water at a maximum temperature of 30°C with 0.5% hydrogen peroxide for 20 minutes.
2- Rinse immediately and thoroughly under running water.

Alternatively:

1- Put in the washing machine with a maximum temperature of 30°C, using the wool/delicates cycle low spin cycle (< 400 rpm), following the dosage suggested by the manufacturer.
2- Leave to dry naturally in a ventilated environment, away from direct sunlight or heat sources.

<u>Complex metal products.</u>
This procedure cannot be applied.

The load tests carried out after several washing cycles with the examined product [11] have not shown substantial resistance decrease.
We detected a possible oxidation beginning on the galvanised steel component: following sanitisation by means of hydrogen peroxide, we advise the lubrication of metal parts (a silicon spray lubricant is recommended), to protect them from the oxidising effect of peroxide. After lubrication, remove any residual lubricant with a dry microfiber cloth.

Lifetime

If the product undergoes disinfection with hydrogen peroxide-based products, its lifetime is then reviewed as follows. Indicate the sanitisation method, its frequency and updated lifetime on its life sheet.

- Textile and plastic products: 12 years from manufacturing, limited to
  - 6 months from the first sanitisation cycle in case of daily sanitisations;
  - 1 year from the first sanitisation in case of weekly sanitisations;
  - 3 years from the first sanitisation cycle in case of monthly or occasional sanitisations.

- Metal products: the lifetime remains unlimited, unless corrosion is detected.

 **Warning**: never mix hydrogen peroxide-based detergents with other detergents.

 **Warning:** do not use solutions with a percentage of hydrogen peroxide exceeding 0,5%. Should any contact with solutions containing a higher percentage arise, withdraw the product from service

 **Warning**: if, following sanitisation, a variation in the consistency and/or colour of the textile/plastic elements occurs, or corrosion of the metal elements arises, withdraw the product from service.

 **Warning**: before use, please refer to the user information and the safety sheet of the chemical product.

**6d – Water vapour**

Having a temperature exceeding 100°C and a high moisturising power, water vapour represents an exceptional method of eco-sanitisation for surfaces of various nature and composition, being able to eliminate the presence of parasites and melt organic dirt represented by the substrate, following the formation of a microbial biofilm.

It is well known that the majority of pathogenic bacteria (non spore-forming) and the viruses are vulnerable at temperatures exceeding 65°C; for this reason, the vapour can destroy the proteo-lipidic coating and the molecular structures of all microorganisms, including the coating of the virus. (12)

It is also indicated by a document about Covid-19 released by the Italian Higher Institute of Health (Istituto Superiore di Sanità) for the cleaning of material and furnishings that cannot be washed, because it does not entail any spray nor splashes that may scatter toxic substances, allergens and pathogenic microorganisms in the environment (8).

Water vapour represents the ideal solution for anyone requiring fast and frequent sanitisations, in view of the speed of cycle and the non-existing costs, once the adequate appliance is purchased; it is advisable to use it in work environments, rental areas and shops. It is also possible to use it as a simple disinfection method, following cleaning or paired with the action of rubbing with a cloth, as a single cycle of cleaning and disinfection.

The maximum vapour temperature allowed for C.A.M.P. products is 120°C with a maximum pressure of 5 bar (these features apply to common household appliances), with the jet applied at a distance exceeding 10 cm and for a maximum of 10 seconds.

Implement the following procedures for all C.A.M.P. products:

Disinfection:

1- Apply the vapour jet from a distance of 10 cm, slowly covering all the product parts, aiming at a 5-second exposure.
2- Leave to dry naturally in a ventilated environment, far from sunlight and heat sources.

Cleaning and disinfection.

1- Apply the vapour jet from a distance of 10 cm, quickly covering all the product parts, aiming at an exposure lasting about one second.
2- Rub with a microfiber cloth to remove dirt.
3- Apply the vapour jet from a distance of 10 cm again, slowly covering all the product parts, aiming at a 5-second exposure.
4- Leave to dry naturally in a ventilated environment, away from sunlight and heat sources.

The load tests carried out after several cycles with a specific household appliance (13) did not reveal any resistance decrease.
Following the sanitisation with water vapour, it is advisable to lubricate mobile metal parts (we recommend a silicon-based spray lubricant), to reinstate its correct functionality. After lubrication, remove any residual lubricant with a dry microfiber cloth.

Lifetime

If the product undergoes water vapour disinfection, its lifetime is reviewed as follows. Indicate the sanitisation method, frequency and updated lifetime on its life sheet.

- Textile and plastic products: 12 years from manufacture, limited to:
  - 2 years from the first sanitisation cycle in case of daily sanitisations;
  - 5 years from the first sanitisation cycle in case of weekly sanitisations;
  - 10 years from the first sanitisation cycle in case of monthly or occasional sanitisations.

- Metal products: the lifetime remains unlimited.

 **Warning**: do not use vapour generators with a temperature exceeding 120°C and pressure exceeding 5 bar. Do not expose to the jet for more than 10 seconds, or at a distance lower than 10 cm.

 **Warning**: do not use a pressure washer.

 **Warning**: if, following sanitisation, a variation in the consistency and/or colour of the textile/plastic elements arises, or corrosion of the metal parts occurs, withdraw the product from service.

 **Warning**: before use, please refer to the user information of the household appliance employed.

**6e – Ozone**

Ozone ($O^3$) is the allotropic form of oxygen ($O^2$), shaped in nature by ultraviolet rays and electric discharge in the air.

It is an oxidising gaseous, reactive and unstable biocide, with a pungent smell, patented in 1950 and considered a "killer of bacteria, spores, mildew and viruses", widely used for the purification, deodorisation and disinfection of air and surfaces in confined environments of any nature for domestic, professional, public and health use [12, 14, 15, 16, 17, 18, 19].
Ozone is also indicated by a document about Covid-19 released by the Italian Higher Institute of Health (Istituto Superiore di Sanità) [21].
After having quickly cleaned with a hydro alcoholic or neutral detergent with a max PH 8 (e.g. Marseille soap), ozone grants a rapid and thorough sanitisation.

Ozone is produced on site with ad-hoc portable generators that transform the water vapour and oxygen in the air into ozone, hydroxyl radicals and hydrogen peroxide inside sealed cased that contain the products requiring disinfection.

Ozone generators are certified professional devices that must be purchased from qualified manufacturers/suppliers with a compliance statement, user and maintenance manuals.

Implement the following procedures for all C.A.M.P. products:

1- Follow the manufacturer instructions and the directions for use described in the technical dossier.
2- Insert the product that need sanitisation inside the sealed container, linked to the ozone generator in its upper part.
3- Ignite the generator ad inject ozone until the optimum concentration of about 0.15-0.25 ppm ($mg/m^{3)}$ is reached, for about 20-30 minutes.
4- Remove the devices from the container.

The load tests carried out after several ozone cycles did not reveal any substantial resistance reduction. Since no extensive data on the influence of ozone on plastic materials is available, it is however advisable to envisage a lifetime reduction.

Lifetime

If the product undergoes ozone disinfection, its lifetime is reviewed as follows. Indicate the sanitisation method, frequency and updated lifetime on the life sheet.

- Textile and plastic products: 12 years from manufacture, limited to:
  - 2 years from the first sanitisation cycle in case of daily sanitisations;
  - 5 years from the first sanitisation cycle in case of weekly sanitisations;
  - 10 years from the first sanitisation cycle in case of monthly or occasional sanitisations.

- Metal products: the lifetime remains unlimited.

**Warning**: if, following sanitisation, a variation in the consistency and/or colour of the textile/plastic elements arises, or if corrosion of the metal parts occurs, withdraw the product from service.

**Warning**: before use, refer to the user information of the ozone generator employed. Request the consultation of specialised companies for the establishment of protocol tests.

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