

# Little powerhouses – what hand creams should accomplish

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The daily work takes its toll on our hands – especially through contact with specific substances. And, the efficacy of hand creams varies a lot – it all depends on the particular formulation.

**T**here is a major difference whether the hands often get in contact with water in the course of daily work or whether they are protected to some extent due to office work – this still is well-known among housewives at a time when washing machines and dishwashers take over a major part of the work involving moist hands.

Hair cutting and cosmetic jobs also deal with alternating working media. Not only water and tensides but also cream components and concentrated disinfecting agents wear out the skin by washing out the components of the skin care substances as well as the natural protective substances of the body.

Working fluids like cooling lubricants, oils and solvents are the substances that are tough on men's hands. Even individuals who only get in contact with paper and packaging may have problems due to the fact that the hands become constantly degreased and irritated. On the other hand, particular working conditions do not allow fattening protective creams as they involve unhygienic fingerprints on the working pieces or even render the working materials useless.

In order to provide help for the various problems and find individually adapted solutions, it is essential to intensely deal with the physical and chemical properties of the hand creams on the market. Before anything else however, certain generally applicable basic rules for the hand care should be considered which all too often are overseen in the daily routine.

- **Water hardness:** Hard water is one of the most frequent causes for cracked skin. Both permanent hardness induced by dissolved calcium sulfate (gypsum) as well as temporary hardness triggered by hydrogen carbonates are rather hard on the skin because they bind the natural fatty acids of the skin. A water softening unit can work miracles in this context. Hydrogen carbonates can already be removed from the water by boiling; boiler scale forms during this process.
- **Lipid content in creams:** It is a widespread misapprehension that high lipid content also is an attribute for quality. What matters, is the ratio of lipids to the concentration of emulsifiers in order to largely minimize the later washing out effect. Particularly recommended are emulsifier free products with moderate lipid content which penetrate easily and leave no marks.
- **Liquid soaps (2 in 1):** frequently contain surface active refatting agents or refat-teners with silicone. They leave a pleasant sensation on the skin which however, is not identical with the actual condition of the skin barrier. A little more inconvenient but better for the skin are cleansers without refatting agents and the application of a hand cream afterwards. Anyway, luke-warm water often is sufficient to cleanse the hands and will also protect the natural barrier substances of the skin.
- **Gloves:** Handling nail enamel remover (acetone), highly concentrated alcohol, isopropyl alcohol or other solvents or disinfecting agents consequently requires the use of gloves. This also applies for extended cleansing activities at home using water with low detergent content.

The appropriate hand cream formulations for specific applications are explained in the following. The components are intended to be a selection and need not all be contained in the preparation. They can be replaced by substances with the same functionality.

## Regenerative hand cream

- Base: emulsifier free base made of triglycerides (neutral oil, wheat germ oil, avocado oil), hydrogenated phosphatidylcholine, shea butter, ceramides and squalane
- Active agents:
  - (pro)-vitamins A, C, E, D-panthenol, biotin and niacin support the regeneration

- amino acids (NMF) and glycerin (low dosage) support the skin hydration
- Additives: no perfumes and preservatives – particularly if barrier disorder is diagnosed. Consistency agents improve the spreading features of a cream.

Note: Hyperpigmentations can be minimized or even removed within several months if vitamin C is used in the form of sodium ascorbyl phosphate (INCI) and the base contains native phosphatidylcholine with linoleic acid. Moreover, this type of hand cream also can be used for an accelerated recovery of the skin after dermatological treatments with antimycotics.

#### Hand cream for frequent work with moist water-based media

- Base: W/O emulsion or, if possible, emulsifier free base, (see above). A better alternative still is a water-free and easily penetrating oleogel.
- Active agents: natural long-chain triglycerides, waxes and phytosterols such as olive oil, avocado oil, jojoba oil, shea butter
- Additives: the cream should be free of water soluble consistency agents such as sodium carbomer, xanthan or hydroxyethyl cellulose.

Note: It is essential to use a high concentration of lipids with low or even without emulsifier content and with excellent penetrability in order to minimize the wash out effect of lipophilic skin caring and protective substances.

#### Hand cream for frequent contact with oily or fatty working substances

- Base: low-fat O/W emulsion or fat free hydrogel
- Active agent: hyaluronic acid, CM-glucan
- Additives: water soluble consistency agents such as sodium carbomer, xanthan, hydroxyethyl cellulose etc.

Note: Consistency agents form a superficial protective film which inhibits the penetration of lipophilic working substances. A low content of fatty substances in the formulation is recommended. Fat free products even provide better protection.

#### Recovering hand cream to treat rhagades

- Base: W/O emulsion or preferably emulsifier free base (see above) with wheat germ oil
- Active agents:
  - astringent agents such as hamamelis extract, tannins or green tea
  - alpha-linolenic acid in the form of linseed oil, kiwi oil or rosehip seed oil have anti-inflammatory effects

- D-panthenol accelerates the epithelisation
- Additives: Sodium azelate used as a consistency agent in concentrations of up to 1 % in presence of phosphatidylcholine which supports the penetration, has a synergistic and antibacterial effect. Other consistency agents such as sodium carbomer may be beneficial in order to improve the mechanical spreading features of the cream.

Note: A parallel medication of oral corticoids can delay the recovery from rhagades. Phosphatidylcholine and vegetable oils keep the skin soft and elastic.

#### Hand cream for dry skin

- Base: W/O emulsion or preferably emulsifier free base (see above)
- Active agents:
  - vegetable oils rich in phytosterols and linoleic acid such as wheat germ oil and avocado oil
  - moisturizing substances: amino acids, urea, glycerin (in low concentration), D-panthenol
  - hyaluronic acid, CM-glucan and aloe vera form a superficial moisturizing buffer on the skin
- Additives: xanthan as a consistency agent

Note: Working with paper and packaging material may lead to a severe degreasing of the skin and consequently cause barrier disorders which still are intensified by paper bulking agents such as gypsum and chalk (calcium carbonate). These bulking agents have the same effect as hard water.

#### Hand cream for the extremely dry and coarse skin

- Base: oleogels (water free) with phosphatidylcholine (absorbs immediately)
- Active agents: highly concentrated vegetable oils rich in phytosterols and linoleic acid
- Additives: zinc and magnesium salts of long chain fatty acids (consistency agents). 12-hydroxystearic acid improves the adhesive properties of the cream on the skin.

Note: This specific cream provides excellent protection for the hands during gardening and against cold weather. UV filters are recommended in case of intense stress due to sun radiation.

#### Hand lotion for oily skin

- Base: O/W lotion with low lipid content or liposomal dispersion
- Active agents: phosphatidylcholine which is rich in linoleic acid, and vitamin E
- Additives: none

Note: Creams are not beneficial for this specific skin condition. Phosphatidylcholine reduces the sebum production, penetrates easily into the skin and keeps it soft.

#### Hand cream for moist skin

- Base: emulsifier free base (see above)
- Active agents: sage oil, farnesol, aluminum chlorohydrate (alternatively alum)
- Additives: water soluble consistency agents are counterproductive as they support the undesired moisture film on the skin.

Note: The above mentioned formulation diminishes the perspirative capacity of the skin.

#### Hand cream for inflamed and reddened skin

- Base: emulsifier free base (see above)
- Active agents:
  - nanodispersed boswellia resin acids (5-lipoxygenase inhibitors), essential omega-3 and omega-6 fatty acids (linseed, kiwi, evening primrose oil) have anti-inflammatory effects.
  - D-panthenol and echinacea extract have recovering components
- Additives: preferably free of perfumes and preservatives

Note: Do not treat weeping skin areas until they are dry!

#### Hand cream for cornification disorders

- Base: emulsifier free base (see above)
- Active agents:

- vitamins: retinol palmitate, tocopheryl acetate, biotin
- urea in concentrations of up to 3 % impedes itching, higher concentrations may irritate the skin. Allantoin can be used alternatively.

- Additives: no perfumes and preservatives
- Note: Native phosphatidylcholine may improve the penetrating characteristics of the active agents.

#### Further tips and suggestions:

- Immediate effects can be achieved in the beauty institute by a generous application of the cream and then adding a hardening and removable occlusive modelage which is left on for 15 minutes.
- As hands get frequently in contact with the perioral area, all persons prone to perioral dermatitis are recommended to use products free of allergenic perfumes and preservatives (listed in the German Cosmetic Regulation).
- Hand creams with specifically advertised high glycerin content have not proved successful since the major part of the water soluble glycerin is washed out during skin cleansing. Consequently, the hands feel extremely dehydrated after the cleansing.

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