



# OptiTens<sup>®</sup>

Top Cleansing Power – Exceptional Skin Compatibility.  
Mild and effective skin cleansing at work.

 Physioderm<sup>®</sup>



## FREQUENT HAND WASHING: AN OCCUPATIONAL HAZARD

Many people get their hands dirty every day – in the truest sense of the word. Working materials like oil, lubricants, graphite or other substances do not only soil the skin, but irritate it as well. In order to remove potentially harmful substances from their hands, workers in industrial and craft sectors use skin cleansers several times a day. However, frequent hand washing is a potential health risk, too. According to the latest findings, work-related skin irritations result from hand washing in nearly 10% of all cases. Although cleansing surfactants are only slightly harmful to the skin, they can cause considerable cumulative damage if the skin is exposed to them repeatedly over long periods of time. As a result, dermatitis may occur.

## **Dermatitis Is The Most Common Occupational Health Risk**

By far, skin diseases are the most common health hazard at the workplace. One third of all recorded occupational diseases in Germany affect the skin. Occupational dermatitis is a heavy burden for the affected workers and can even force them to give up their profession. They also cause costs amounting to approximately 1.5 billion euros for companies each year, mainly due to a loss of productivity.



## **Prevention Through Skin Care**

Effective skin care at work comprises the three pillars protection, cleansing and care.

### **Skin Protection**

Protective ointments, creams or gels form a barrier against working materials and reduce the penetration of potentially harmful substances into the skin.

### **Skin Cleansing**

Cleansers remove dirt as gently as possible.

### **Skin Care**

Skin care products nourish the skin with lipids and moisture and, thus, support the natural regeneration of stressed skin.

## **As Strong As Necessary – As Gentle As Possible**

Professional skin cleansers have to meet two important requirements. They should be as gentle to the skin as possible – even when used frequently. At the same time, they have to be powerful enough to remove even highly-adhesive substances effectively and without residue. This combination is a real challenge for manufacturers.

## FOCUS ON OCCUPATIONAL SKIN CLEANSERS

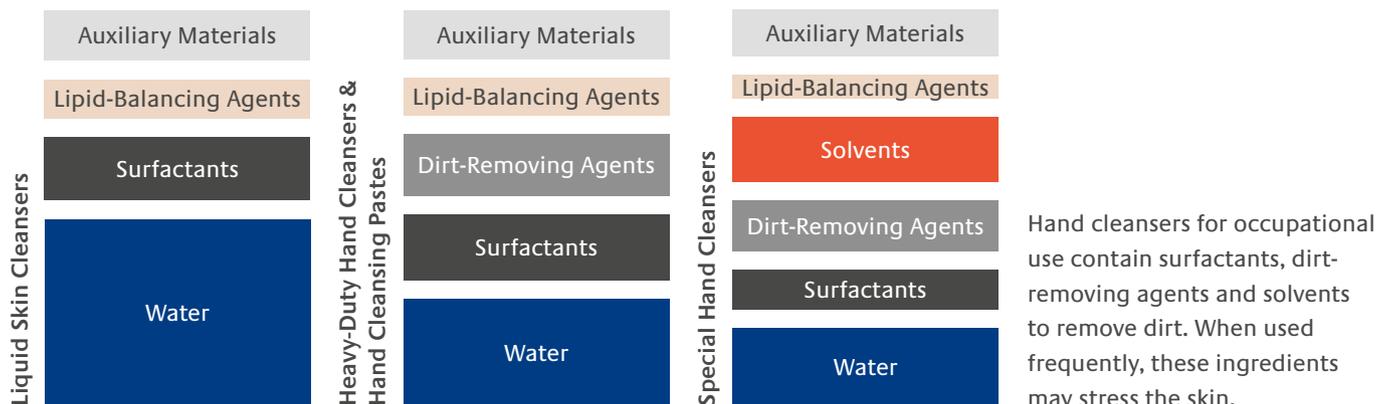
Although comparatively few occupational skin diseases can clearly be traced back to soaps and heavy-duty hand cleaners in Germany, the actual damage caused by skin cleansers is probably significantly higher. As detergents weaken the skin's barrier function, they make it vulnerable to the penetration of harmful substances and potential allergens. This means that even dermatitis that is not directly caused by hand cleansers is sometimes partly induced by them.

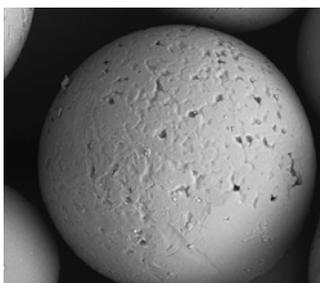
### The Problem Of Effect And Compatibility

Mild cleansers have limited cleansing power, while hand cleansers suitable for the removal of adhesive substances and heavy dirt contain aggressive surfactants and sometimes even solvents and abrasive scrubbing agents. This makes them a strain on stressed hands. The skin care experts at Peter Greven Physioderm (PGP) have set themselves the goal of solving this dilemma. PGP develops specific products and ingredients for occupational skin cleansers that offer excellent performance, but are gentle to the skin.

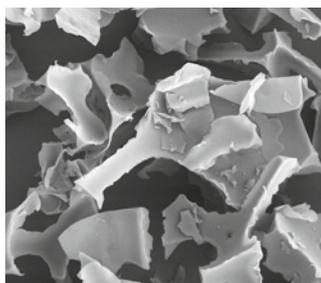
### Innovations For Healthy Skin: Active Soft Pearls® and OptiTens®

In 2006, PGP introduced an innovative dirt-removing agent – Active Soft Pearls® (ASP), skin-friendly wax pearls that remove even heavy and highly-adhesive dirt effectively without damaging the skin. Now, PGP has succeeded in optimizing the composition of skin cleansers. With OptiTens®, the manufacturer offers a global novelty: a surfactant combination that offers outstanding cleansing power and remarkable skin compatibility at the same time.

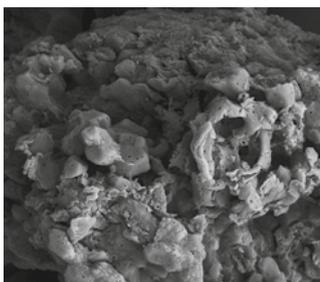




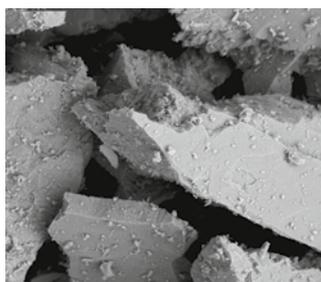
Active Soft Pearls® (ASP)



Walnut Shell Powder

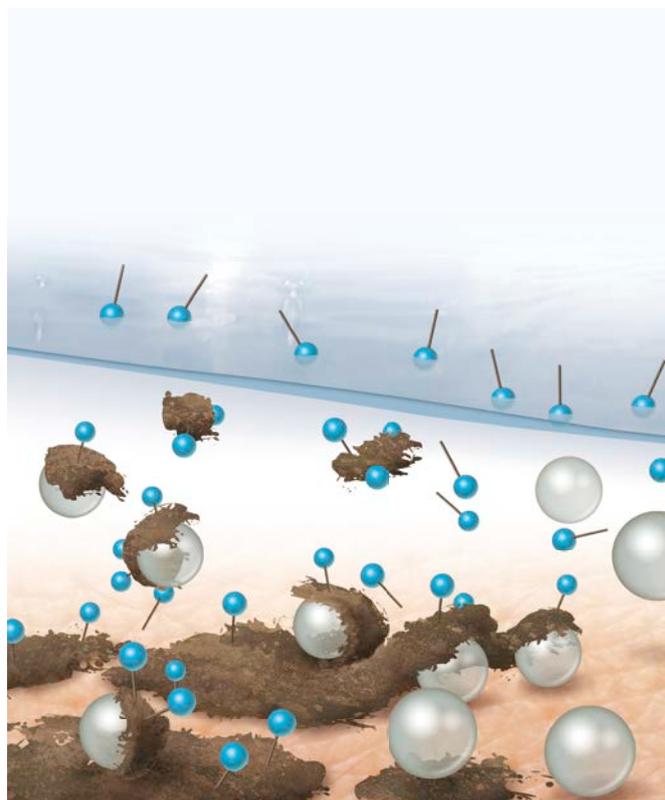


PU Powder



Sand

The scanning electron microscope (SEM) clearly shows the different surface structure of Active Soft Pearls® in contrast to traditional scrubbing agents.



## Active Soft Pearls®: Skin-Friendly Dirt-Removing Agents For Heavy-Duty Hand Cleansers

Heavy-duty hand cleansers and hand cleansing pastes contain scrubbing agents in order to remove highly-adhesive substances, e.g. greases, oil or graphite, by mechanical abrasion. While hard, sharp-edged scrubbing agents like sand, walnut shell powder or plastic particles loosen dirt, they also abrade the skin's epidermis at the same time. Micro-injuries occur and the risk of contact allergies increases significantly. The repeated use of scrubbing agents may lead to irritant dermatitis.

PGP's skin-friendly dirt-removing agents Active Soft Pearls® (ASP) loosen dirt particles without abrading or damaging the skin – while being just as effective against heavy and highly-adhesive dirt as abrasive scrubbing agents are. In contrast to conventional abrasive scrubbing agents, these soft, smooth pearls made of hydrogenated castor oil do not primarily support the surfactants' cleaning process by mechanical friction, but by their lipophilic surface structure, which is able to bind oily dirt particles.

# SURFACTANTS: WASHING-ACTIVE GREASE REMOVERS

Occupational skin cleansers use surfactants to remove dirt from the skin. The cleansing effect of these washing-active substances is based on their interaction with water. Due to their particular molecular structure, surfactants reduce the surface tension of water, allowing it to spread better on the skin. At the same time, they increase the solubility of greases and oils in water and support the loosening of dirt particles.

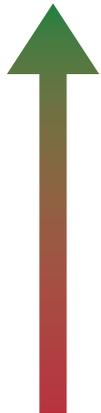
## Compromise Between Performance And Protection

Like scrubbing agents and solvents, surfactants may harm the skin as well. Up to now, the general rule has been: the stronger the cleansing effect, the heavier the skin exposure. Since, until now, no surfactant could combine strong performance with high skin compatibility, occupational skin cleansers usually combine several surfactants;

a strong base surfactant provides the cleansing power while a milder co-surfactant ensures better skin compatibility. However, this compromise is not a solution to the problem that workers often have to use cleansers multiple times a day to remove dirt.

## Previous Vision Of Surfactants

High Skin  
Compatibility



Lower Skin  
Compatibility

### Co-Surfactant

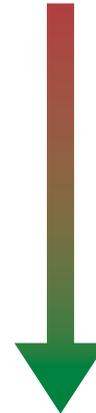
Sugar Surfactants (COCO GLUCOSIDE)  
Betaine (COCAMIDO-PROPYLBETAINE)  
Sulfosuccinate (DISODIUM LAURETH SULFOSUCCINATE)

### Base Surfactant

Sodium Laureth Sulfate  
Sodium Lauryl Sulfate (SODIUM C 12-18 ALKYL SULFATE)

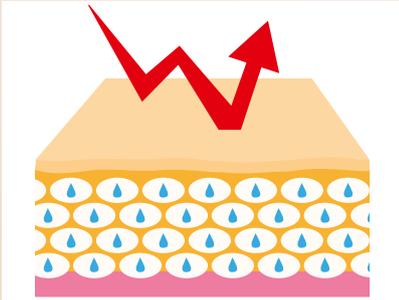
Conventional Soaps Made Of Fats/Oils  
(Stearate/Oleate/Palmitate)

Lower Cleansing  
Power

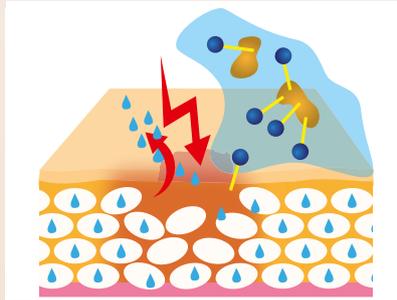


High Cleansing  
Power

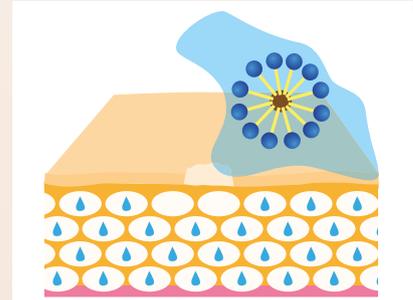
## Compatibility And Efficacy Of Classic Surfactants



Due to its natural barrier function, healthy skin is protected against harmful substances, such as working materials and detergents.



Classic surfactants degress the skin and, thus, weaken the skin barrier. As its natural protective function is weakened, the skin loses moisture. External influences can penetrate the skin more easily and may cause lasting damages.



OptiTens® has been proven to reduce the skin's water loss after washing. With comparable cleansing effect, the skin compatibility with OptiTens® is much higher and vice versa.

## Natural Lipids Of The Skin Suffer From Frequent Contact With Surfactants

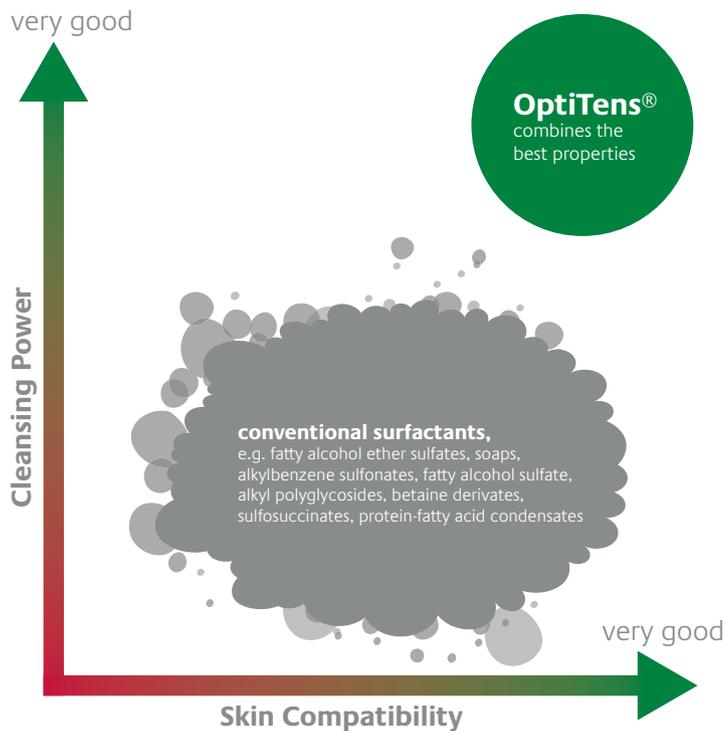
Lipids play a crucial role in the health of the skin. The cells of the stratum corneum – the outer horny layer of the skin – are connected by natural fats that prevent the skin from losing moisture and are vitally important for maintaining its barrier function. Moreover, healthy skin is also protected by a hydrolipid film, the so-called acid mantle. This layer built up of water and fats that are produced by the skin's sebaceous glands protects the epidermis from drying out and acts as an additional barrier against harmful substances, bacteria and fungi.

Dissolving fats is one of the main tasks of surfactants. However, they do not distinguish between contaminating fats and the skin's important natural lipids, which protect and soften the skin. Thus, the frequent use of surfactants for skin cleansing may damage the acid mantle, dehydrate the stratum corneum and lead to rough and cracked skin. Due to the impairment of its barrier function, the skin becomes susceptible to harmful substances that cause further damage. As a result, dermatitis may occur in the long term.

# INNOVATION OPTITENS®: SKIN-FRIENDLY AND EFFICIENT

Up to now, it was believed that surfactants could provide either excellent cleansing power or outstanding skin compatibility, but not both. However, PGP was not satisfied with this assumption, and achieved a major breakthrough in the field of skin cleansing. In the course of a three-year project in cooperation with scientists of the University of Osnabrück, the PGP skin care experts developed a true novelty: a surfactant combination that is as effective as it is skin-friendly.

## Surfactants And Their Properties



## Occupational Skin Cleansing Without Compromise

OptiTens® is powerful against dirt and offers best cleaning properties, but is very gentle to the skin.

The innovative surfactant combination protects the skin's natural lipids. As a result, the epidermis does not dry out and maintains its natural barrier function – even in case of frequent washing.

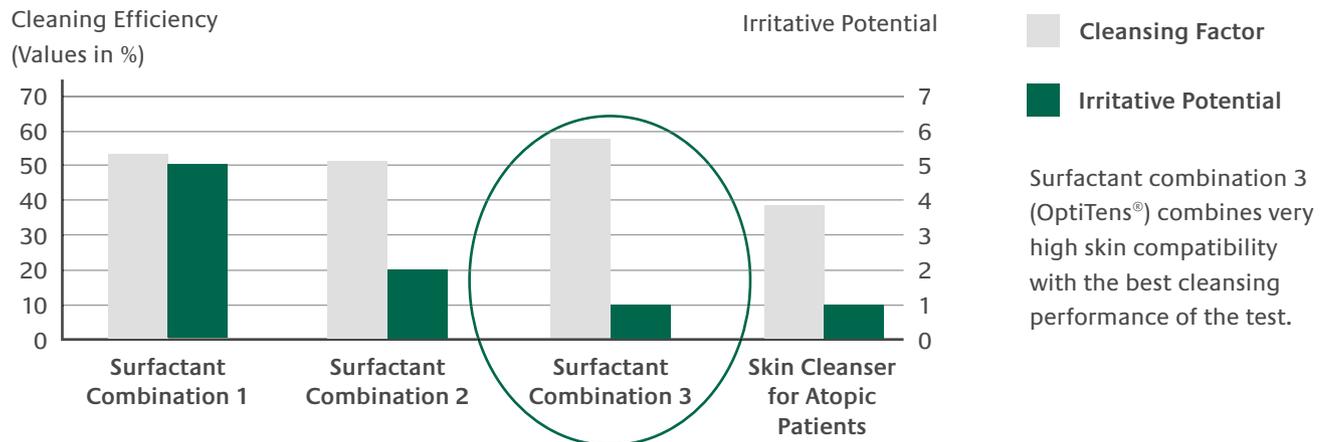
## RESEARCH PROJECT „SENSICLEAN“

In the course of the research project „Sensiclean“ that was commissioned by PGP, various surfactants and surfactant combinations were analyzed with regard to their cleansing efficiency and their potential for skin irritation at the University of Osnabrück from 2014 to 2017. Finding surfactant formulations that combine excellent cleansing properties with high skin compatibility was the goal of the project.

In a first step, skin-irritation studies in the form of modified patch tests with a variety of surfactants and surfactant combinations were run at the University of Osnabrück. Interim results provided PGP with the basis for systematically developing skin-friendlier solutions. In the subsequent skin cleansing studies, one extremely skin-friendly surfactant combination stood out due to an extremely high performance. A repetitive irritation test confirmed that the powerful formulation caused no measurable skin irritation even after repeated washing.

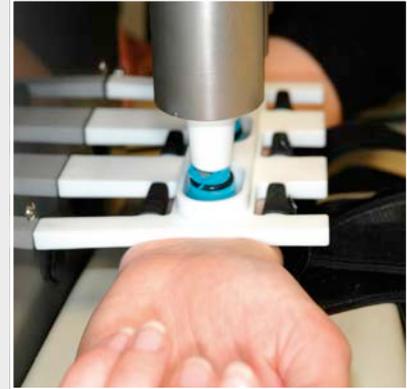
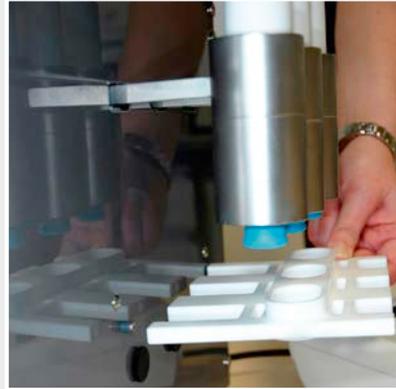
### PGP Develops Novel Surfactant Combination OptiTens®

Based on the studies carried out at the University of Osnabrück, PGP was able to develop an additive that offers remarkable performance and excellent skin compatibility at the same time – an innovation that heralds a revolution in the field of occupational skin cleansing.



## Comparability Through Standardized Cleansing

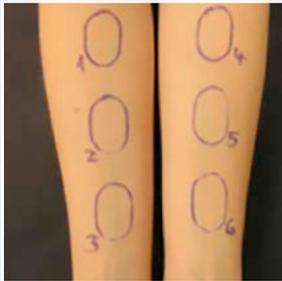
Standardized skin cleansings with the DGUV skin washing apparatus and the subsequent chromametric detection of the skin's brightness ensured the comparability of the results with regard to the cleaning performance of the surfactant combinations.



DGUV skin washing apparatus from Osnabrück

## Method Of Soiling

In order to be able to determine the cleaning factor of the surfactant combinations, model dirt (type „waste oil“) was applied to the skin within the appropriately marked measuring fields. The  $L^*$  value refers to the chromametric detection of the skin's brightness before soiling (L1), after soiling (L2) and after cleansing (L3).



L1



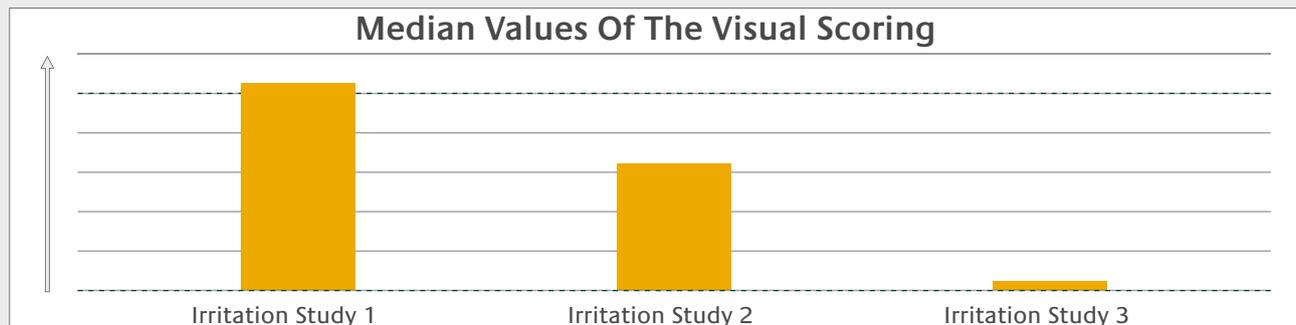
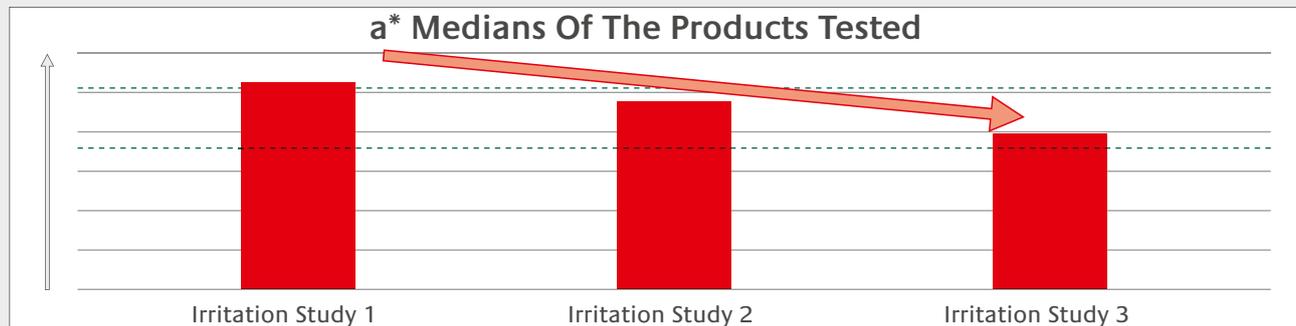
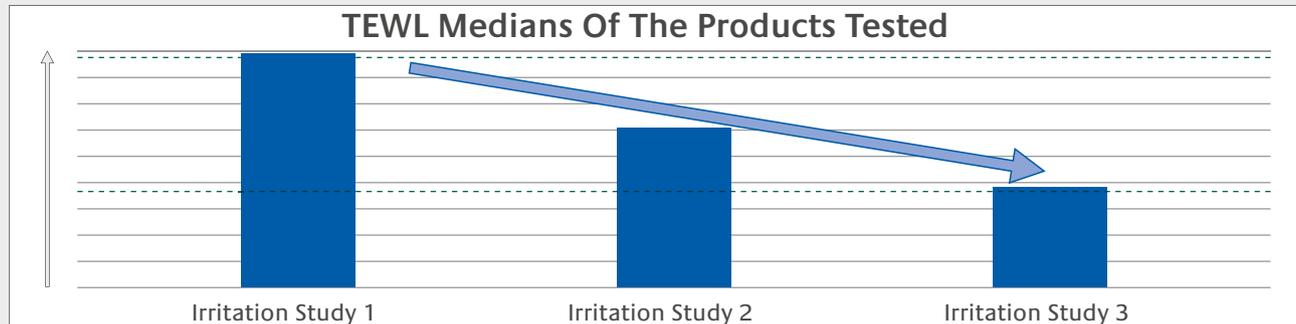
L2



L3

## Skin Irritation Studies As Basis For Product Development

The results of the irritation studies conducted at the University of Osnabrück provided the basis for the work of the product developers at PGP. In this way, the extent of the irritative potential of the surfactant combinations – measured by the parameters Transepidermal Water Loss (TEWL) and Extent of Skin Redness (A\* value) – was reduced from study to study.



## PGP: INTEGRATED CONCEPTS FOR OCCUPATIONAL SKIN CARE

Effective skin care is an essential requirement for a long and healthy working life. PGP is fully committed to the goal of providing every business, workplace and employee with the best possible occupational skin care. In addition to top-quality products for protection, cleansing and care of occupationally stressed skin, the skin care expert offers all necessary tools to ensure the active use and proper application of these products. For example, PGP's manual or touch-free closed dispensing systems with disposable valves ensure that every product is dispensed precisely and hygienically. PGP also provides comprehensive information material and a full range of services, allowing every business to determine and implement their ideal occupational skin care measures – in the most practical, economical and effective way.





## The OptiTens® Product Range At A Glance

- Outstanding cleansing power
- Effective and skin-friendly cleansing
- Particularly gentle to the skin
- Recommended for frequent skin cleansing
- Solvent-free
- Also suitable as shower gel for the entire body

## EFFECTIVE AND GENTLE SKIN CLEANSING AT WORK

OptiTens® is breaking new ground by offering skin cleansers that completely remove even heavy and highly-adhesive dirt without exposing occupationally-stressed skin to undue damage. PGP has filed a patent for OptiTens®. The innovative surfactant combination is the basis for a new generation of PGP products offering significant benefits for occupational skin care.

### STEPHALEN® OPTIFOAM

#### Economical Solution for Light to Medium Dirt

The mild cleansing foam Stephalen® OptiFoam cleans occupationally stressed skin gently and thoroughly. It stands out by being extremely economical in use and it is completely free from fragrance and colorants.

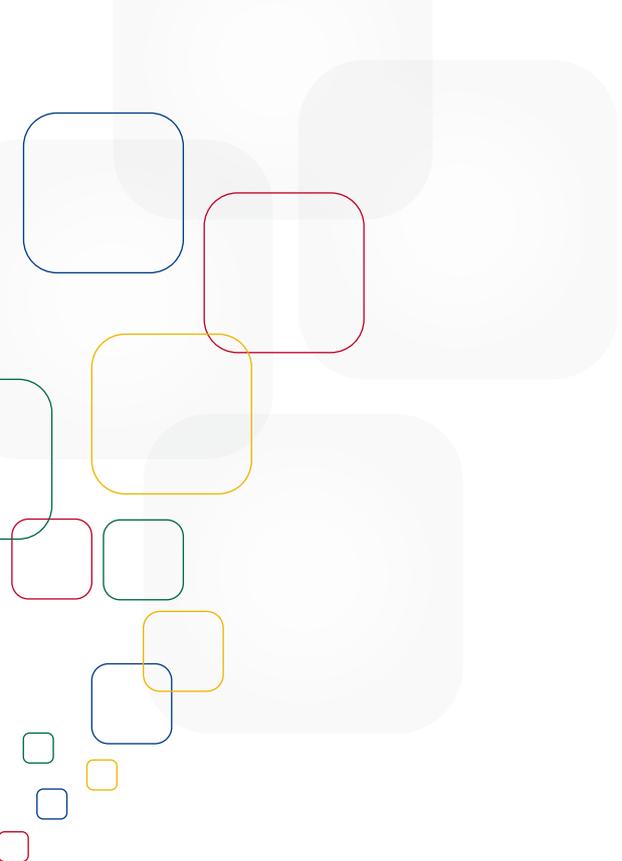


### STEPHALEN® OPTIWASH

#### Universal Wash Gel for Light and Medium Dirt

The highly effective wash gel Stephalen® OptiWash is the ideal solution for removing light to medium dirt. Like all PGP products containing OptiTens®, the gel is both efficient and skin-friendly, making it an ideal choice for frequent use.





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07/2018

