Dr. Schumacher

*We protect your health.*

INSTRUMENTS

# Optimal Instrument Reprocessing with Dr. Schumacher


## Cleaning and disinfection:
## **Efficient. Effective. Comprehensive.**

## IMPRINT

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## LISTINGS

IHO | ÖGHMP | RKI A | RKI A/B | RKI/DVV | VAH

**IHO** - *Industrieverband Hygiene und Oberflächenschutz für industrielle und institutionelle Anwendung e. V. Disinfectant list (www.desinfektionsmittelliste.de).* **ÖGHMP** - *Product listed in the disinfectant list of the Austrian Society for Hygiene, Microbiology and Preventive Medicine (www.oeghmp.at).* **RKI** *A - Product listed in the disinfectant list of the Robert Koch Institute according to § 18 IfSG, area of activity A.* **RKI A/B** - *Product listed in the disinfectant list of the Robert Koch Institute according to § 18 IfSG, area of activity AB.* **RKI/DVV** - *Virucidal product according to the guideline of the German Association for the Control of Viral Diseases (DVV) and the Robert Koch Institute (RKI).* **VAH** - *Product listed in the disinfectant list of the Verbund für Angewandte Hygiene e. V. (www.vah-online.de).*

## SOURCES

**Hygiene requirements for reprocessing – *Page 5***

Commission for Hospital Hygiene and Infection Prevention (KRINKO) at the Robert Koch Institute (RKI) and the Federal Institute for Drugs and Medical Devices (BfArM). Hygiene requirements for the reprocessing of medical devices. Bundesgesund- heitsbl 2012; 55:1244-1310.

**Validation of reprocessing processes – *Page 6***

German Society for Hospital Hygiene e. V. (DGKH), German Society for Sterile Supply e. V. (DGSV), Instrument Reprocessing Working Group (AKI). DGKH guideline for the validation and routine monitoring of automated cleaning and thermal disinfection processes for medical devices. Central sterilization 2014.

**Preventing material damage, optimization through ultrasonic bath – *Page 7***

Instrument reprocessing working group (AKI). Value-preserving reprocessing of instruments. Güters- loh, 2017; No. 11.

**High demands on manual instrument reprocessing – *Page 11***

Commission for Hospital Hygiene and Infection Prevention (KRINKO) at the Robert Koch Institute (RKI) and the Federal Institute for Drugs and Medical Devices (BfArM). Hygiene requirements for the reprocessing of medical devices. Bundesgesundheitsbl 2012; 55:1244-1310 // German Society for Hospital Hygiene (DGKH), German Society for Sterile Supply (DGSV), Instrument Reprocessing Working Group (AKI) in cooperation with the Verbund für angewandte Hygiene e. V. (VAH). Guideline for the validation of manual cleaning and manual chemical disinfection of medical devices. Central Sterilization 2013.

**Automated cleaning and disinfection – *Page 20***

German Society for Hospital Hygiene e. V. (DGKH), German Society for Sterile Supply e. V. (DGSV), Instrument Reprocessing Working Group (AKI). DGKH guideline for the validation and routine monitoring of automated cleaning and thermal disinfection processes for medical devices. Central sterilization 2014. Detailed information on the Ao concept can be found at: Michels W. The Ao concept for thermal disinfection. Hosp. hyg. + Inf. verh. 26, Issue 3 (2004): 103-106.

Introduction

# Quality Products for Modern **Instrument Reprocessing**

Hardly any area of disinfection and hygiene is as closely regulated as the reprocessing of medical devices - and for good reason. Patients must be able to rely on complete protection against infection during all medical procedures. This is a challenging task for the Central Sterile Supply Departments (CSSD). Medical devices are becoming increasingly complex and time and cost pressures continue to grow. The reprocessing facilities are an important factor in the cost efficiency of hospitals and doctor's offices. For an optimal workflow, instruments must be available again quickly and with efficient use of personnel.

The reprocessing of medical instruments is based on rapid disinfection with a broad spectrum of efficacy and powerful cleaning. The innovative and modern formulations from Dr. Schumacher can help speed up work steps, reduce personnel costs and extend the use of the life of investment items.

One example is the mildly alkaline-enzymatic cleaner THERMOSHIELD XTREME. It impresses with its particularly material-friendly properties and diverse application possibilities for a wide range of machine types.

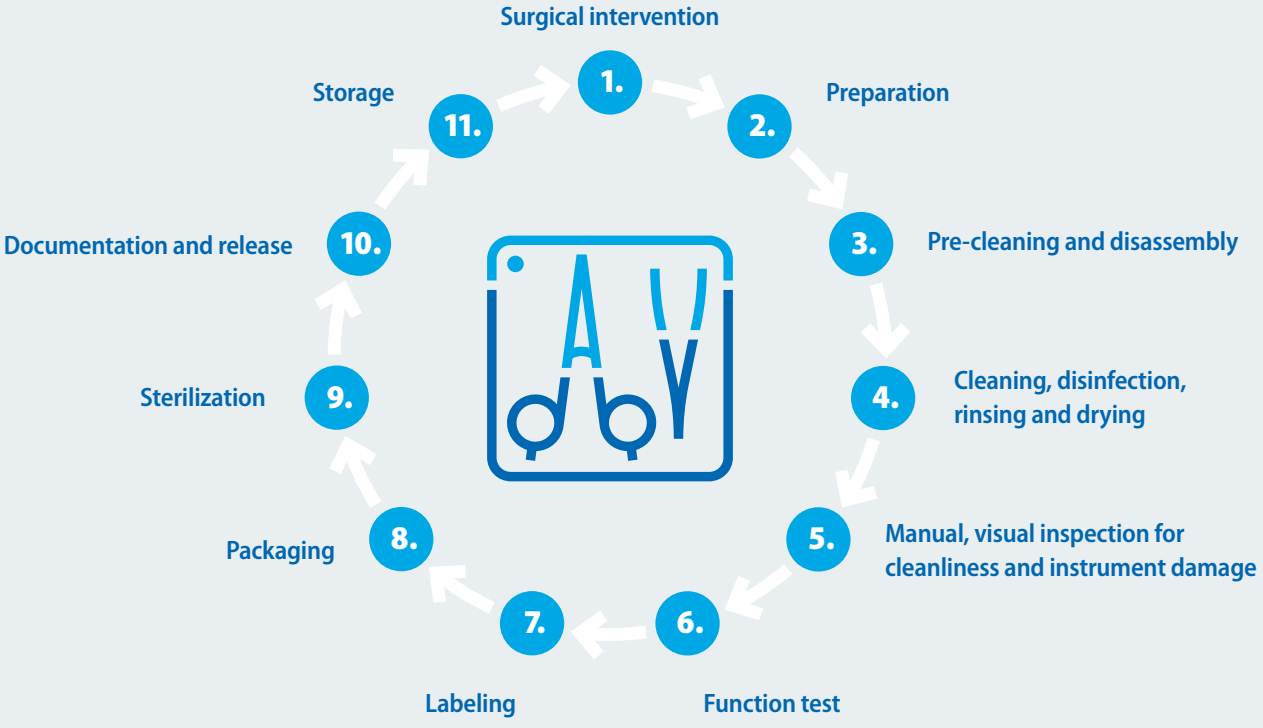
Instrument reprocessing

# Security Throughout **the Process**

## The reprocessing cycle

The reprocessing of instruments is a complex process with many individual steps - from preparation in the operating room to proper storage. Every single step must be carried out with great care to minimize the risk of infection and material damage.

While pre-cleaning plays a major role in the success of the reprocessing, automated processes are preferable for the subsequent cleaning and disinfection steps.




## The reprocessing cycle in detail

**1.** *After a procedure, 1. coarse soiling and residues are removed during preparation* **2.** *while still in the operating theater and instruments are disassembled according to the manufacturer's instructions if necessary. Dry disposal is preferred for disposal* **3.** *with transportation in a closed system and a maximum waiting time of 6 hours before reprocessing. Wet disposal requires immersion in a detergent or combined detergent and disinfectant solution.* **4.** *during automated cleaning, disinfection and rinsing in the washer-disinfector, validated load patterns must be observed, instruments must be loaded correctly and rinsing shadows must be prevented. The program selection depends on the validated procedures - thermal or chemo-thermal. If a mechanical process is not available, manual reprocessing is possible. In manual instrument reprocessing, cleaning and disinfection are carried out in two separate steps. First, cleaning with the use of cleaning-active, non-protein-fixing process chemicals and intermediate rinsing (no process chemical residues). In the second step, the spectrum of efficacy must be taken into account during disinfection - especially if no sterilization takes place afterwards. The final rinse and drying are followed by a visual inspection for cleanliness and perfect condition - with maintenance and repair if necessary. The reprocessing cycle is completed with* **6th - 9th** *functional testing, labelling, packaging and, if necessary, sterilization of the instruments. After* **10th** *documentation and approval, the instruments are sent to* **11th** *storage.*

Medical Device Classification

# Hygiene Requirements **for Proper Reprocessing**

## Correct classification and reprocessing of medical devices

The basis for proper reprocessing of instruments and medical devices is the classification according to risk potential. Instruments are classified and evaluated according to their application and properties, either individually or as a product group. The manufacturer's instructions on the design of the instruments and their reprocessing must also be taken into account.

## CLASSIFICATION AND REPROCESSING OF MEDICAL DEVICES

| Classification | Requirements | Application | Reprocessing |
|---|---|---|---|
| **Non-critical medical devices** | No special preparation requirements. | Contact with intact skin (e.g. kidney dishes, ECG electrodes). | Cleaning and disinfection with limited virucidal efficacy. |
| **Semi-critical medical devices A** | No special preparation requirements. | Contact with mucous membrane or pathologically altered skin (e.g. speculum). | Cleaning and disinfection with virucidal efficacy. |
| **Semi-critical medical devices B** | Increased reprocessing requirements. The quality of cleaning cannot always be confirmed directly by inspection due to complex structures like lumina (cavities) or rough, surfaces that are difficult to clean. | Contact with mucous membranes or pathologically altered skin (e.g. flexible endoscopes). | Disinfection with virucidal efficacy. Validated automated cleaning and disinfection strongly prefered. Special requirements for the preparation of flexible endoscopes must be taken into account.[1] |
| **Critical medical devices A** | No special preparation requirements. | Medical devices for use with blood, blood products or other sterile medicinal products and medical devices. Penetration of the mucous membrane, contact with blood, internal tissues or organs and wounds (e.g. retractors). | Validated, automated cleaning and disinfection strongly preferred. Mandatory sterilization with steam. |
| **Critical medical devices B** | Increased reprocessing demands. Complex instruments with surfaces that are difficult to access like joints and lumina (cavities). | MIC instruments (e.g. MIC trocar, scissors, clamps) | Mandatory validated automated cleaning/ thermal disinfection in WD and sterilization with steam. |
| **Critical medical devices C** | Highest reprocessing requirements. | z. e.g. ERCP catheter | Mandatory pre-cleaning immediately after use, followed by validated automated cleaning/thermal disinfection in WD and suitable sterilization.[2] |

*1 – For example, Annex 8 of the KRINKO/BfArM recommendation: „Hygiene requirements for the reprocessing of flexible endoscopes and additional endoscopic instruments".*
*2 – There is no consistent evidence of prion inactivation for non-thermal sterilization.*

Validation

# Validation in Instrument **Reprocessing**

## Performance requirements for washer-disinfectors

### IMPLEMENTATION AND INITIAL VALIDATION

**INSTALLATION QUALIFICATION**

Check and confirm whether the appliance meets the required specifications and whether the organizational, structural and technical requirements are met. Instructions for use, installation plans, pipe and electrical plans, and test instructions must all be documented.

**VERIFICATION**

Installation/transfer protocol

**OPERATIONAL QUALIFICATION**

Test and determine the performance of the WD during operation, taking into account the ambient conditions. For example, by comparing of the target vs. actual performance and checking the error detection system.

**VERIFICATION**

Documentation/qualification report

### PERFORMANCE QUALIFICATIONS

**PERFORMANCE QUALIFICATIONS**

Check and determine whether the instruments have been cleaned, disinfected, rinsed and, if necessary, dried in accordance with the required standard, e.g. by microbiological efficacy testing and/or checking the load pattern.

**VERIFICATION**

Documentation/validation report

**PERFORMANCE QUALIFICATION STANDARD PROTOCOL**

Review annually: complete or partial repetition of the tests from previous validations.

**VERIFICATION**

Documentation/validation report

### PERFORMANCE QUALIFICATIONS

**PERFORMANCE QUALIFICATIONS FOR SPECIAL SCENARIOS**

In certain situations, an unscheduled performance qualification is required:

- In the event of deviating results during routine checks
- For new purchases of medical devices or racks
- When changing process chemicals
- After maintenance work

The performance qualification for special scenarios does not have to be carried out as a complete performance qualification. The tests must be appropriate to the medical device and its risk assessment and must be carried out in accordance with the recognized technology and taking into account the current scientific standards.

**VERIFICATION**

Documentation/validation report

## Technical review and evaluation

In order to ensure the continued success of the reprocessing process, a technical review and evaluation must be carried out within a defined framework. The validation is carried out by external specialists. There is a special focus on the validation of automated, machine-based processes. The scope of the measures is specified in DIN EN ISO 15883.

Completion of the validation process is considered proof that the processes in the WD or sterilizer meet the previously defined requirements and can be reproduced. Manual processes must also be validated using suitable SOPs for the entire reprocessing process.

Measures for Material Preservation

# Prevent Damage **to Materials**

### Instrument value preservation

Reprocessing must be performed in such a way that high-quality instruments do not wear out prematurely or become damaged. The use of different materials in a medical device places high demands on reprocessing. Mistakes in reprocessing can lead to irreparable damage to sensitive instruments.

## Important measures

### Adequate rinsing

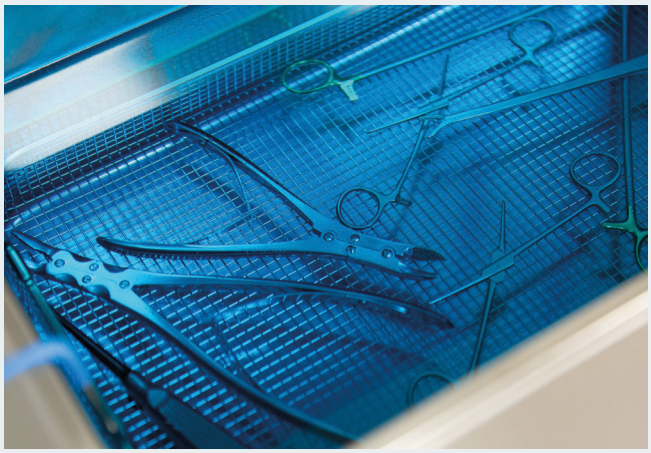
Reprocessing chemicals can lead to the formation of deposits on instruments if not adequately rinsed. Persistent organic residues can lead to pitting corrosion. Sufficient rinsing between the individual process steps is essential for proper instrument care.

### Follow the appropriate loading pattern

Incorrect loading of the machine can lead to incorrect cleaning and build up of deposits. Correct loading is also important to avoid friction and vibrations during the WD program that may lead to surface damage.

### Monitor water quality

Special water quality requirements for instrument reprocessing must be taken into account at every stage of the treatment process in order to avoid material damage such as deposits, secondary rust and pitting corrosion.



Improve cleaning performance

# Optimized cleaning with **ultrasonic baths**

### The ultrasonic bath advantage

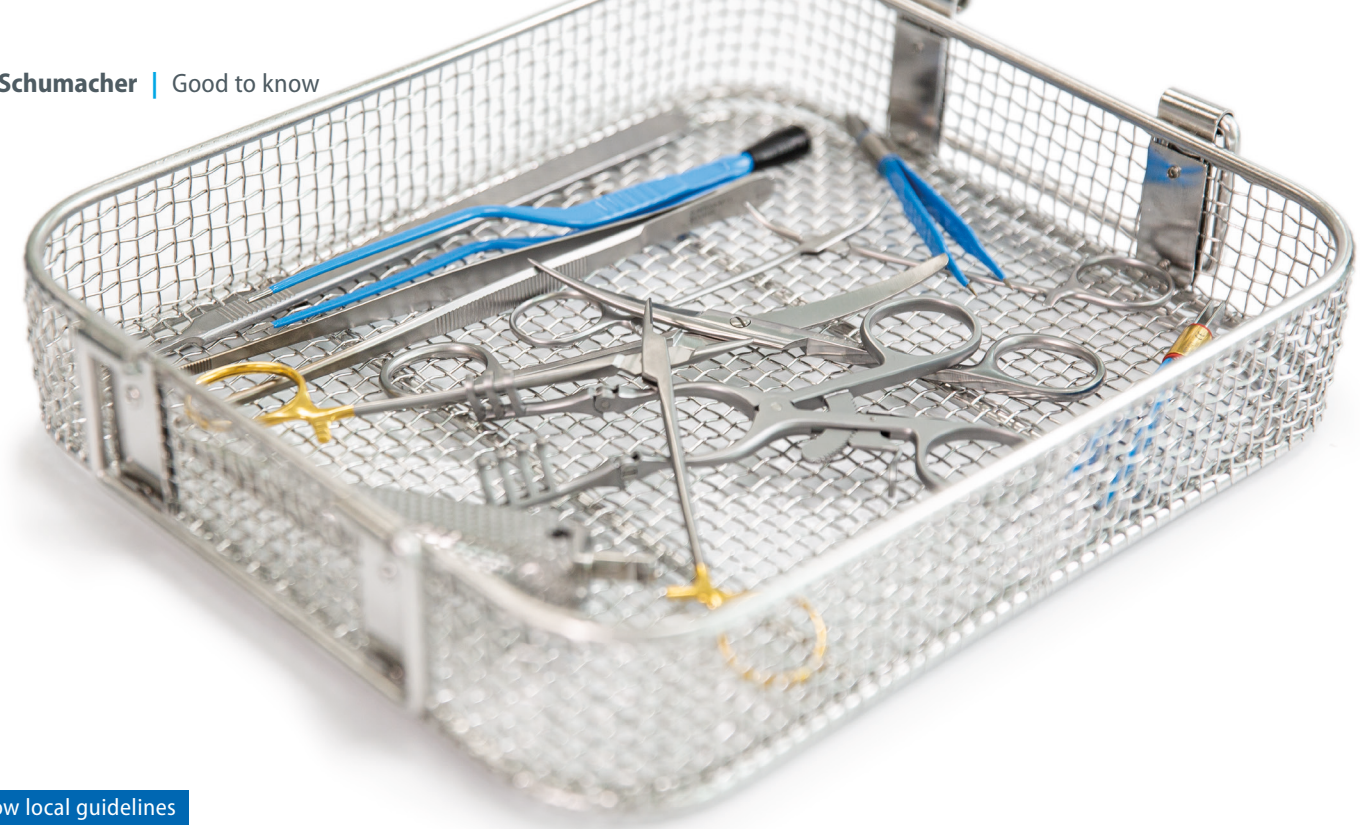
The cleaning performance of reprocessing chemicals can be optimized when used in ultrasonic baths. Stubborn dirt is gently and efficiently removed from the surface of instruments with ultrasonic vibrations. Follow the instructions for using the ultrasonic bath, and the recommmendations of medical device and the process chemicals manufacturers to ensure the best results.

## Get the most from your chemicals

### Multifaceted applications

In addition to the pre-cleaning of medical devices before automated reprocessing, ultrasonic baths also support manual cleaning and disinfecting cleaning before subsequent immersion disinfection as well as post-cleaning.

- ***Do not use protein-fixing process chemicals***
- ***Select temperatures < 40 °C, to avoid the formation of crusts due to protein denaturation***
- ***De-gas freshly prepared cleaning or disinfecting cleaning solution before first use***
- ***Change the solution more frequently when heavier soiling is present***
- ***Avoid sonic shadows and dead zones due to incorrect loading***



Follow local guidelines

# High demands on the manual **reprocessing**

### Proper manual reprocessing

The manual cleaning and disinfection of instruments involves increased risk and is therefore mainly used as a fail-safe concept. Local regulators generally place the same quality control requirements on manual reprocessing as for automated reprocessing. To ensure the quality of the results, users must establish a quality management system, employ only qualified and trained personnel and follow standardized work instructions.

### Start with a solid base

Medical device manufacturers' recommendations and the risk assessment of the medical device is the basis for successful instrument reprocessing. The scope of the manufacturer's information is regulated in DIN EN ISO 17664:2017. The recommendation of the reprocessing chemical manufacturers must also be taken into account.

The „Guideline for the validation of manual cleaning and manual chemical disinfection of medical devices" [1] offers practical support for the standardization of manual reprocessing. There, users will find recommendations and flow charts for the creation of work instructions and their validation. Also included are detailed checklists for all aspects of manual processing - from the structural and technical requirements to the testing as part of required validation.

## Required Efficacies

### Disinfection

*The required spectrum of efficacy for the disinfection of semi-critical medical devices depends on the reprocessing cycle.*

### With thermal sterilization

*Bactericidal, yeasticidal and limited virucidal (effective against enveloped viruses, such as HBV, HCV, HIV) required. Fungicidal, mycobactericidal and sporicidal activity may be required in certain cases.*

### Without thermal sterilization

*Bactericidal, yeasticidal, tuberculocidal and fully virucidal efficacies required. Fungicidal, mycobactericidal and sporicidal activity may be required in certain cases.*

Cleaning and disinfection

# Manual **Reprocessing**

## Typology of reprocessing chemicals

The chemicals used for reprocessing contain different active ingredients and additives for different areas of application. Chemical manufacturers must develop, test and market their products in accordance with the European Medical Devices Directive (MDR) or other local relevant regulatory bodies. The advertised claims must be proven and documented, e.g. material compatibility or biocompatibility. Statements about remaining residues must also be documented and the product documentation is a prerequisite for obtaining a CE mark.

## The right product for each step

### MANUAL CLEANING AND DISINFECTION

| Application | Ingredients | Effect | Product examples | |
|---|---|---|---|---|
| Cleaning | pH neutral enzymes and surfactants | • Strong, active cleaning (see graphic)<br>• Value-preserving<br>• Non-fixing | **PLURAZYME EXTRA** | PAGE 11 |
| | pH-neutral with surfactants | • active cleaning (see graphic)<br>• value-preserving<br>• non-fixing | **MANUSHIELD CLEANER** | PAGE 11 |
| Disinfectant cleaning | Quaternary ammonium compounds (QAV and enzymes, surfactants) | • Active cleaning<br>• High material compatibility<br>• Non-fixing | **PERFEKTAN ENZYME** | PAGE 12 |
| | Alkylamine and surfactants | • Efficient cleaning<br>• High material compatibility<br>• Incompatible with aldehydes | **PERFEKTAN NEW** | PAGE 12 |
| Disinfection | Peracetic acid | • Comprehensively effective according to EN 17126 (sporicidal)<br>• Short exposure times<br>• Compatible | **PERFEKTAN ACTIVE** | PAGE 14 |
| | Aldehydes | • Broad spectrum of activity (virucidal)<br>• Material compatibility<br>• Formaldehyde-free concentrate | **DESCOTON EXTRA** | PAGE 15 |

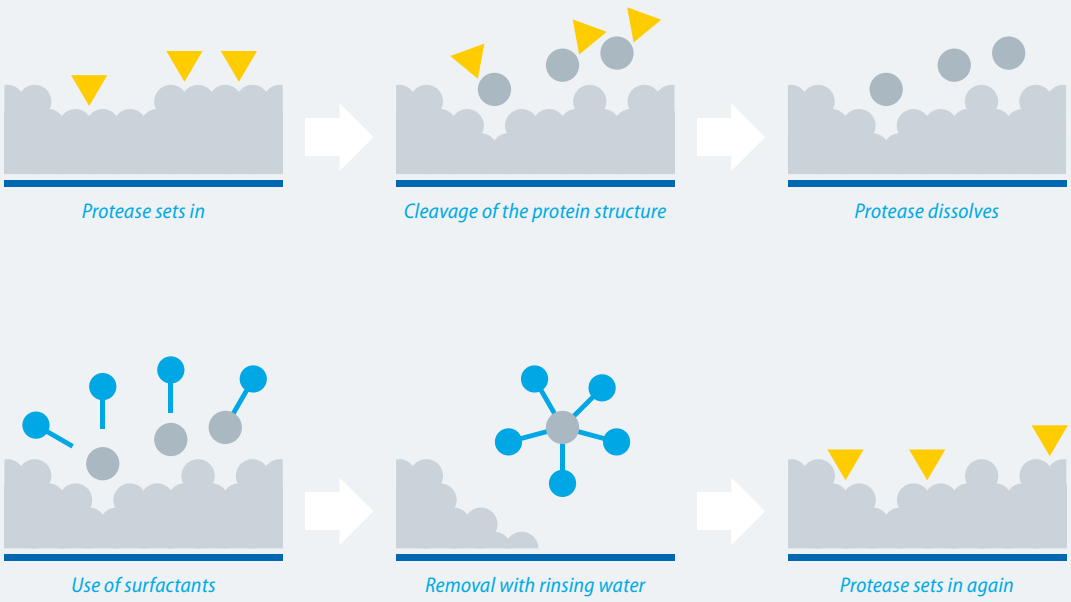
Cleaners for instrument reprocessing

# Synergistic **Effect**

## Powerful reprocessing

Cleaning is an important step in the reprocessing of instruments. Cleaning-active, non-protein-fixing process chemicals are used for this purpose. Cleaners must remove soiling reliably, but must not damage the high-quality instruments. If only a cleaning effect is to be achieved, products based on surfactants and enzymes do a great job.

### INTERACTION OF ENZYMES AND SURFACTANTS




## Mode of action of enzymes and surfactants

*The powerful protease breaks down proteins into smaller, more easily detachable components and thus helps to actively support cleaning. The surface-active surfactants make it easier to access the surface of the instruments. The surfactants envelop dirt particles, including those broken down by the protease detached protein residues and thus facilitate removal with rinsing. In the further interaction of enzymes and surfactants, the instruments are comprehensively cleaned.*


# PLURAZYME® EXTRA

## Multi-enzymatic cleaner for reprocessing surgical instruments and endoscopes

- **Active cleaning and fresh fragrance make reprocessing easier**
- **Neutral pH and coordinated cleaning complex maintain the value of the instruments**
- **Very good non-fixing cleaning - ideal for pre-cleaning**

PLURAZYME EXTRA is the ideal cleaning concentrate for the manual reprocessing of a wide range of medical devices. The high material compatibility enables the cleaning of surgical instruments, rigid and flexible endoscopes. The fragrance and excellent cleaning power make it pleasant to use, whether in an immersion bath or ultrasonic bath. The active formula of three enzymes and non-ionic surfactants effectively penetrates a wide range of organic impurities from coagulated blood to mucus and grease - without fixing. The high compatibility with other detergents and disinfectants ensures uncomplicated and flexible integration of PLURAZYME EXTRA into your processes.

| Application and dosing recommendation for cleaning | |
|---|---|
| Depending on the degree of soiling | 0,4 – 2 % (4 ml/L – 20 ml/L)<br>max. 40 °C mind. 5 min |
| Recommendation for ultrasound baths | 0,25 % (2,5 ml/L) max. 40 °C mind. 5 min |

| Composition - 100 g solution contains |
|---|
| 5 – 15 % non-ionic surfactants |
| Enzyme |
| Preservative 1,2-benzisothiazol-3(2H)-one, didecylmethyl poly(oxyethyl)ammonium propionate |
| Fragrance: Limonene |

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Bottle | 12 | 1 L | 00-138-010 |
| Dosing bottle | 10 | 1 L | 00-138-010-01 |
| Bottle | 6 | 2 L | 00-138-020-02 |
| Canister | 3 | 5 L | 00-138-050-02 |


# MANUSHIELD® CLEANER

## Liquid cleaner for instruments and endoscopes

- **pH-neutral and gentle on materials**
- **Good cleaning power and easy to integrate**
- **Fragrance-free**

MANUSHIELD CLEANER is a concentrate for the thorough cleaning of flexible and rigid endoscopes as well as surgical and (dental) medical instruments. As a pH-neutral and gentle cleaner, MANUSHIELD CLEANER is also ideal for cleaning flexible endoscopes. The fragrance-free formulation is based on surfactants, is extremely efficient and can be used with all water hardnesses and in ultrasonic baths. It is also compatible with the following disinfectants: PERFEK- TAN ENZYME, PERFEKTAN NEW, PERFEKTAN ENDO, PERFEKTAN TB, PERFEKTAN ACTIVE and DESCOTON EXTRA. This makes it very easy to integrate the MANUSHIELD CLEANER into reprocessing processes.

| Application and dosing recommendation for cleaning | |
|---|---|
| Cleaning of flexible endoscopes and medical and surgical instruments | 1 % (10 ml/L)<br>Depending on soiling:<br>0.25 % (2.5 ml/L) - 5 % (50 ml/L) |

| Composition - 100 g solution contains |
|---|
| 5 – 15 % non-ionic surfactants |

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Bottle | 6 | 2 L | 00-104-020-02 |
| Canister | 3 | 5 L | 00-104-050-01 |

PREVENT


VAH

IHO

# PERFEKTAN® ENZYME

## Multi-enzymatic disinfectant cleaner for reprocessing instruments and endoscopes

- **High material compatibility due to neutral pH**
- **For effective non-fixing enzymatic pre-cleaning**
- **Disinfecting effect with a pleasant fragrance**

PERFEKTAN ENZYME is the ideal disinfectant cleaner for the manual preparation and reprocessing of thermostable and thermolabile medical devices. Thanks to its powerful multi-enzyme complex of four enzymes and selected surfactants, PERFEKTAN ENZYME provides a good cleaning result for organic soiling without protein fixation. The fresh fragrance creates a pleasant environment and the disinfectant effect based on QAVs, without aldehydes and amines, means that PERFEKTAN ENZYME offers added occupational safety. The neutral pH value ensures good material compatibility and preserves the value of medical devices. PERFEKTAN ENZYME is also suitable for use in ultrasonic baths. PERFEKTAN ENZYME can also be used for reprocessing flexible endoscopes and is fully compatible with THERMOSHIELD FLEX and THERMOSHIELD DESINFEKTANT.

**Spectrum of efficacy and exposure times**

| | PREVENT | PRESERVE | PROTECT |
|---|---|---|---|
| Recommended use for disinfecting cleaning of flexible endoscopes and for disinfecting surgical instruments | 3 % – 5 min<br>1 % – 15 min | | |

**Composition - 100 g solution contains**

17,5 g N,N-didecyl-N-methyl-poly(oxyethyl)ammoniumpropionat

0,5 g Didecyldimethylammoniumcarbonat

Fragrances: Limonene, Linalool, Geraniol

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Bottle | 12 | 1 L | 00-128-010 |
| Bottle | 6 | 2 L | 00-128-020 |
| Canister | 3 | 5 L | 00-128-050 |

*Prevent – limited virucidal and bactericidal, levurocidal effect. Preserve - limited virucidal PLUS and bactericidal, levurocidal efficacy. Protect - virucidal and bactericidal, levurocidal efficac*

PREVENT


VAH

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# PERFEKTAN® NEW

## Aldehyde-free concentrate for instrument cleaning and disinfection

- **Effective tuberculocide**
- **Excellent cleaning power**
- **Ideal for cleaning surgical instruments in an ultrasonic bath**

PERFEKTAN NEU is a powerful cleaning, liquid concentrate based on alkyl amines. The efficient aldehyde- and phenol-free product formulation enables gentle and user-friendly instrument reprocessing and prevents unwanted protein fixation during cleaning. The disinfectant properties of PERFEKTAN NEU ensure a high level of user safety during cleaning. PERFEKTAN NEU is ideal for non-fixing cleaning of endoscopes and is also suitable for use in ultrasonic baths.

**Spectrum of efficacy and exposure times**

| | PREVENT | PRESERVE | PROTECT |
|---|---|---|---|
| Recommended use for disinfecting cleaning of flexible endoscopes and surgical instruments | 2 % – 30 min | | |
| Application recommendation for tuberculocidal disinfection of medical devices | 2 % – 60 min | | |

**Composition - 100 g solution contains**

3,6 g N-(3-aminopropyl)-N-dodecylpropan-1,3-diamin

Fragrances: Limonene, Citronellol

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Dosing bottle | 10 | 1 L | 00-136-010 |
| Canister | 3 | 5 L | 00-136-050 |

*Prevent - limited virucidal and bactericidal, levurocidal effect. Preserve - limited virucidal PLUS and bactericidal, levurocidal efficacy. Protect - virucidal and bactericidal, levurocidal efficacy.*

PREVENT



VAH

IHO

# PERFEKTAN® TB

## Aldehyde-free concentrate for instrument cleaning and disinfection

- **Aldehyde-free preparation with good cleaning power**
- **Gentle on materials**
- **Pleasant smell**

PERFEKTAN TB is a particularly economical, gentle, cleaning-active instrument disinfectant for daily use in the dental practice. Its outstanding antimicrobial efficacy ensures a high level of personal protection during instrument reprocessing. Due to its aldehyde-free formulation, PERFEKTAN TB has a pleasant odor and is suitable for use on medical instruments.

**Spectrum of efficacy and exposure times**

| | PREVENT | PRESERVE | PROTECT |
|---|---|---|---|
| Recommended use for disinfectant cleaning or disinfection of surgical instruments | 3 % – 15 min<br>2 % – 30 min<br>1 % – 60 min | | |

**Composition - 100 g solution contains**

3,75 g Cocospropylendiamin-1,5-bis-guanidinium-diacetat

5,6 g N, N-didecyl-N-methyl-poly(oxyethyl)ammoniumpropionat

Fragrance: Limonene

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Dosing bottle | 10 | 1 L | 00-122-010-01 |
| Bottle | 6 | 2 L | 00-122-020-02 |
| Canister | 3 | 5 L | 00-122-050-01 |

*Prevent - limited virucidal and bactericidal, levurocidal effect. Preserve - limited virucidal PLUS and bactericidal, levurocidal efficacy. Protect - virucidal and bactericidal, levurocidal efficacy.*

# ORANGE SOLVENT

## Special cleaner for cleaning the surfaces of medical devices

- **Made from natural orange oil**
- **With special cleaning power**
- **Easily removes sticky residues and markings**

ORANGE SOLVENT is a ready-to-use cleaning solution for the thorough removal of stubborn residues from medical instruments and inventory. Also for removing adhesive residues, permanent markers and streaks on floors. Economical to use.

**Composition**

Citrus Sinensis Peel Extract

Limonene

Decyl Oleate

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Bottle | 9 | 250 ml | 00-805-0025 |
| Bottle | 6 | 500 ml | 00-805-005 |

***PREVENT***


VAH

IHO

# PERFEKTAN® ENDO

## Aldehyde-free concentrate for instrument cleaning and disinfection

- **Gentle on materials**
- **Ideal for disinfecting pre-cleaning of endoscopes**
- **Good cleaning power**

PERFEKTAN ENDO is a gentle, cleaning-active instrument disinfectant based on a patented active ingredient principle. As an aldehyde and phenol-free disinfectant cleaner, PERFEKTAN ENDO is characterized by good cleaning properties and is ideal for disinfecting, non-fixing pre-cleaning of instruments and endoscopes. The excellent antimicrobial efficacy ensures a high level of personnel protection during instrument reprocessing.

**Spectrum of efficacy and exposure times**

| | ***PREVENT*** | PRESERVE | PROTECT |
|---|---|---|---|
| Application recommendation for disinfecting cleaning of flexible endoscopes | 3 % – 15 min<br>2 % – 30 min<br>1 % – 60 min | | |

**Composition - 100 g solution contains**

3,75 g Cocospropylendiamin-1,5-bis-guanidinium-diacetat

5,6 g N, N-didecyl-N-methyl-poly(oxyethyl)ammoniumpropionat

Fragrances: Limonene

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Dosing bottle | 10 | 1 L | 00-121-010-01 |
| Bottle | 6 | 2 L | 00-121-020-02 |
| Canister | 3 | 5 L | 00-121-050-01 |

*Prevent – limited virucidal and bactericidal, levurocidal effect. Preserve - limited virucidal PLUS and bactericidal, levurocidal efficacy. Protect - virucidal and bactericidal, levurocidal efficacy.*

***PROTECT***


RKI/DVV

VAH

IHO

ÖGHMP

# PERFEKTAN® ACTIVE

## Powder concentrate for instrument cleaning and disinfection

- **Very good material compatibility**
- **Rapid disinfection thanks to oxidative action system**
- **Completely soluble**

Highly effective powder concentrate for manual disinfection of medical instruments and rigid and flexible endoscopes. PERFEKTAN ACTIVE is an easily and completely soluble powder and therefore reliable and safe to use. Based on the active ingredient peracetic acid generated in the mildly alkaline application solution, PERFEKTAN ACTIVE achieves a maximum spectrum of efficacy with excellent material compatibility, even with sensitive materials such as silicone. The oxidative active system of PERFEKTAN ACTIVE uses peracetic acid to provide efficient disinfection, which reacts completely to form water, acetic acid and oxygen.

**Spectrum of efficacy and exposure times**

| | PREVENT | PRESERVE | ***PROTECT*** |
|---|---|---|---|
| A pplication recommendation for final disinfection of semi-critical medical devices and flexible endoscopes (according to RKI recommendation) | | | 2 % – 60 min<br>3 % – 30 min |

**Composition**

Active substance: Peracetic acid (in-situ) > 850 ppm (1 %ige Lösung).

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Sachet | 100 | 40 g | 00-155-0004 |
| Bucket | 6 | 1 kg | 00-155-010 |

*Prevent – limited virucidal and bactericidal, levurocidal effect. Preserve - limited virucidal PLUS and bactericidal, levurocidal efficacy. Protect - virucidal and bactericidal, levurocidal efficacy.*

PROTECT


VAH

IHO

# DESCOTON EXTRA

## Disinfectant for instruments and endoscopes

- **Virucidal according to harmonized EN standard**
- **Formaldehyde-free concentrate**
- **Suitable for final disinfection**

DESCOTON EXTRA is a particularly fast-acting virucidal liquid concentrate for the disinfection of endoscopes and surgical instruments. The formaldehyde-free product formulation is characterized by economical application concentrations and broad efficacy including virucidal and tuberculocidal properties with good material compatibility. DESCOTON EXTRA is ideal for the final virucidal disinfection of flexible and rigid endoscopes and medical instruments.

**Spectrum of efficacy and exposure times**

| | PREVENT | PRESERVE | PROTECT |
|---|---|---|---|
| Application recommendation for bactericidal, levurocidal, tuberculocidal, mycobactericidal (M. avium, M. terrae), virucidal Final disinfection | | | 3 % – 60 min |

**Composition - 100 g solution contains**

12 g glutaraldehyde

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Dosing bottle | 10 | 1 L | 00-150-010 |
| Bottle | 6 | 2 L | 00-150-020-01 |
| Canister | 3 | 5 L | 00-150-050 |

*Prevent – limited virucidal and bactericidal, levurocidal effect. Preserve - limited virucidal PLUS and bactericidal, levurocidal efficacy. Protect - virucidal and bactericidal, levurocidal efficacy.*

A modern complete range

# Automated Cleaning **and disinfection**

## THERMOSHIELD for automated reprocessing

With the THERMOSHIELD family, Dr. Schumacher offers a modern, comprehensive range for automated cleaning, disinfection and neutralization. CSSDs benefit from material-friendly formulations that offer the highest level of safety and instrument value retention. THERMOSHIELD products are compatible with a wide range of machine types and can be easily integrated into the CSSDs' processes, which are designed for efficiency. The highlight is THERMOSHIELD XTREME. This mildly alkaline-enzymatic cleaner is particularly gentle on materials and is therefore also suitable for the processing of sensitive medical products.

## THERMOSHIELD® – The Chemistry

### AUTOMATED CLEANING AND DISINFECTION

| Application | Ingredients | Effect | Product examples | |
|---|---|---|---|---|
| Cleaner | Mildly alkaline and enzymatic | • efficiently removes organic contamination and greasy residues<br>• for sensitive materials such as anodized aluminum | **THERMOSHIELD XTREME** | PAGE 19 |
| | Mildly alkaline and enzymatic | • for complex geometries and narrow lumens<br>• gentle, efficient cleaning of sensitive materials | **THERMOSHIELD FLEX** | PAGE 18 |
| | Highly alkaline pH value > 10, surfactant-free | • effective against protein contamination<br>• high material compatibility | **THERMOSHIELD BASIX** | PAGE 20 |
| Neutralizer | Citric acid pH value 1 | • protects against limescale and inorganic deposits<br>• protects sensitive materials<br>• use with alkaline products | **THERMOSHIELD C** | PAGE 20 |
| | Phosphoric acid pH value 0 | • prevents organic deposits<br>• use after alkaline products<br>• suitable for basic cleaning | **THERMOSHIELD P** | PAGE 21 |
| Rinse aid | Citric acid pH value 2 | • prevents deposits<br>• accelerates drying<br>• preserves value | **THERMOSHIELD SHINE** | PAGE 21 |

Using the Right Program

# Instrument reprocessing with **thermal disinfection**

## Efficient and gentle on materials

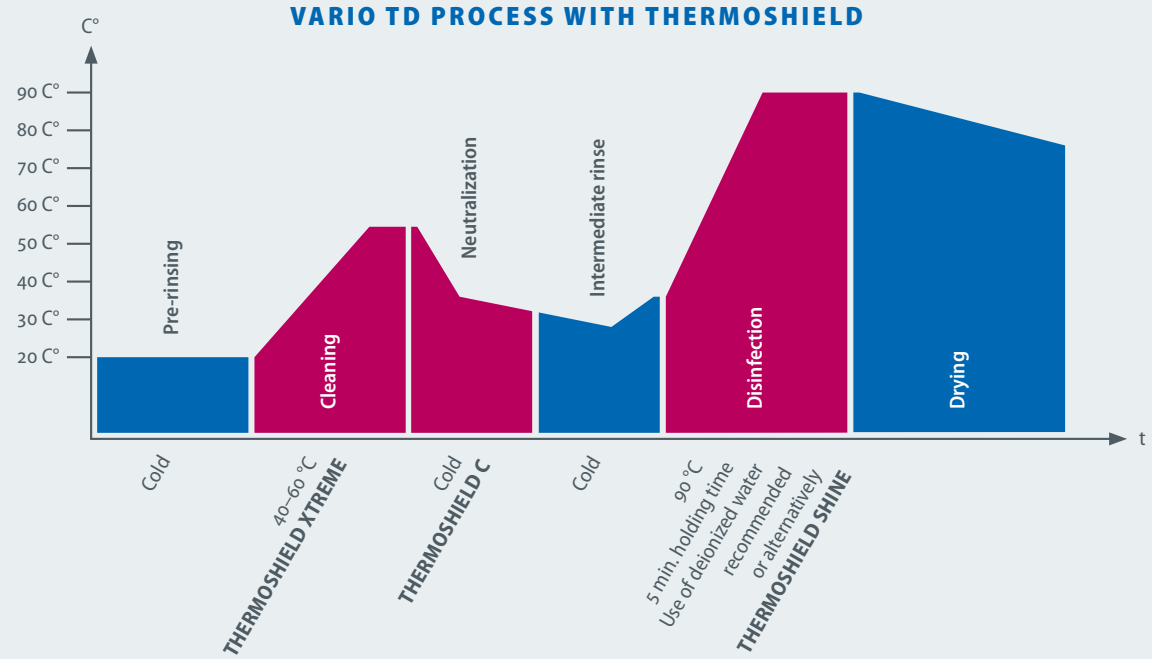
Automated cleaning and disinfection not only allow for consistent, validated results, but also optimize the value retention of instruments during reprocessing. Validation of the WD and the cleaning and disinfection processes in accordance with the EN ISO 15883 series of standards is a prerequisite for automated reprocessing. Both thermal and chemo-thermal processes are possible. The choice of program depends on the risk classification, the degree of contamination and the temperature resistance of the instrument.

## Thermal disinfection

*Thermal disinfection is the most commonly used automated process and is suitable for thermostable instruments from 65 °C. The so-called Vario TD program is preferred. Thermal disinfection takes place at temperatures between 90 and 95 °C at a holding time of 5 minutes.*

## Chemo-thermal disinfection

*Thermolabile instruments such as endoscopes are chemo-thermally processed. Disinfection takes place at temperatures below 60 °C, with the addition of a disinfectant. Sufficient intermediate rinsing must be ensured.*




## The $A_0$-Concept

*The $A_0$ value is defined in EN DIN ISO 15883-1 as a benchmark for the killing of microorganisms in moist heat processes. It is assumed that a temperature over a certain period of time achieves a predictable killing of microorganisms, depending on their thermal resistance. For thermal-resistant viruses such as hepatitis B, an $A_0$ value of 3000 is required. This is also generally recommended for the processing of surgical instruments and corresponds to a temperature of 90 °C with a holding time of 5 minutes.*

PROTECT


NEW


# THERMOSHIELD® DESINFEKTANT

## Disinfectant for chemo-thermal endoscope reprocessing

- **User-friendly due to very low aldehyde content**
- **Minimal odor nuisance**
- **Gentle on materials with flexible endoscopes**

THERMOSHIELD DESINFECTANT is a very gentle and user-friendly preparation for the chemothermal disinfection of flexible endoscopes at 55-60 °C. In combination with the enzymatic cleaner THERMOSHIELD FLEX, it offers an optimal solution for gentle cleaning and disinfection in endoscope washing machines. The preceding manual endoscope reprocessing can ideally be carried out with MANUSHIELD CLEANER or PLURAZYME EXTRA. THERMOSHIELD DESINFECTANT is particularly gentle on the material as its composition is based on glutaral. THERMOSHIELD DESINFEKTANT is particularly user-friendly because its low aldehyde content means that the odor nuisance is significantly lower than with many comparable preparations.

**Spectrum of efficacy and exposure times**

| | PREVENT | PRESERVE | PROTECT |
|---|---|---|---|
| Application recommendation for chemothermal disinfection of flexible endoscopes and surgical instruments (55 – 60°C) | | | 1 % – 5 min |

**Composition - 100 g solution contains**

10 g glutaral

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Flat canister | 3 | 5 L | 00-134-050-01 |

*Prevent – limited virucidal and bactericidal, levurocidal effect. Preserve - limited virucidal PLUS and bactericidal, levurocidal efficacy. Protect - virucidal and bactericidal, levurocidal efficacy.*

# THERMOSHIELD® FLEX

## Enzymatic cleaner for chemothermal endoscope reprocessing

- **Powerful, modern cleaner for flexible endoscopes**
- **Gentle cleaning of organic soiling with enzymes and selected surfactants**
- **Excellent compatibility, especially with sensitive materials**

THERMOSHIELD FLEX is a mildly alkaline, high-performance cleaning product specially designed for the automated reprocessing of flexible endoscopes and other thermolabile medical devices, such as anesthesia accessories. The synergistic power of enzymes and surfactants dissolves any organic contamination even in narrow lumens and successfully prevents re-adhesion. This excellent cleaning performance is verified according to EN 15883-5 and works just as effectively at low temperatures. Due to the mildly alkaline pH and the gentle cleaning complex, very good material protection with long-term value retention is achieved. THERMOSHIELD FLEX is ideally matched to the machine disinfectant THERMOSHIELD DESINFEKTANT and also to the manual cleaners PERFEKTAN ENZYME and PLURAZYME EXTRA. The result is a stable and energy-efficient process that contributes to patient safety and cost reduction.

**Application and dosing recommendation for cleaning**

| | |
|---|---|
| Reprocessing of flexible endoscopes and thermolabile medical devices: depending on soiling | 3 – 5 ml/L (0,3 – 0,5 %) |
| Surgical instruments and additional medical instruments: | 3 – 10 ml/L (0,3 – 1 %) |

**Composition - 100 g solution contains**

< 5 % non-ionic surfactants

Enzyme

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Flat canister | 3 | 5 L | 00-183-050 |

*Prevent – limited virucidal and bactericidal, levurocidal effect. Preserve - limited virucidal PLUS and bactericidal, levurocidal efficacy. Protect - virucidal and bactericidal, levurocidal efficacy.*


# THERMOSHIELD® XTREME

## Mildly alkaline enzymatic cleaner for automated reprocessing

- **Outstanding cleaning performance**
- **Innovative surfactant combination**
- **Visible shine and value retention of the instruments**

THERMOSHIELD XTREME is an enzymatic, mildly alkaline cleaner for the mechanical reprocessing of medical and surgical instruments in washer-disinfectors. The combination of special, coordinated surfactants with a highly active enzyme complex ensures optimum cleaning results. The synergistic active principle of the ingredients efficiently removes organic impurities such as proteins, blood, tissue residues and fatty residues. THERMOSHIELD XTREME can be used with deionized water without additional neutralizer or rinse aid. At the same time, THERMOSHIELD XTREME is particularly gentle on materials, even sensitive materials such as anodized aluminium can be treated. The recommended application concentrations correspond to a pH value of over 10. Even with particularly stubborn organic soiling (e.g. on bone punches), very good results can be achieved with THERMOSHIELD XTREME by manual pre-cleaning in an ultrasonic bath, combined with automated reprocessing.

| Application and dosing recommendation for cleaning | |
|---|---|
| Depending on soiling and area of application | 3 – 10 ml/L<br>Contact time 10 min bei 55 °C |

| Composition - 100 g solution contains |
|---|
| < 5 % anionic surfactans |
| 5 – 15 % non-ionic surfactants |
| Enzyme |

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Flat canister | 3 | 5 L | 00-170-050 |
| Canister | 1 | 10 L | 00-170-100 |

## The benefits of THERMOSHIELD® XTREME

# **Excellent** cleaning performance

The perfect combination of surfactant and enzyme complex provides optimal cleaning results. This provides safety, as further cleaning measures both before and after the WD cycle are minimized.

# **Mild alkaline** enzymatic cleaning

Maintaining the value of the instruments saves costs, as instruments can be used for longer.

# **High** material compatibility

Thanks to the compatibility of THERMOSHIELD XTREME with materials, the number of products required can be products can be reduced and logistical processes optimized.


# THERMOSHIELD® BASIX

## Alkaline surfactant-free cleaner for automated reprocessing

- **Protects instrumentsand machines with corrosion inhibitors**
- **Surfactant-free, low-foaming formula**
- **pH value > 10 in the application concentration**

THERMOSHIELD BASIX is a highly alkaline, surfactant-free cleaner for the automated reprocessing of surgical instruments, laboratory utensils and basins in washer-disinfectors. The high alkalinity of THERMOSHIELD BASIX results in good cleaning performance against blood and other protein-containing impurities. The good material compatibility and corrosion inhibitors protect instruments and machines. The recommended application concentrations correspond to a pH value of over 10.

| Application and dosing recommendation for cleaning | |
|---|---|
| Depending on soiling and area of application | 2 – 8 ml/L (0,2 – 0,8 %) |

**Composition - 100 g solution contains**

< 5 % phosphonates

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Flat canister | 3 | 5 L | 00-173-050 |


# THERMOSHIELD® C

## Neutralizing agent for automated reprocessing

- **Based on citric acid**
- **Efficient neutralization**
- **Gentle reprocessing of sensitive materials**

THERMOSHIELD C is a liquid concentrate based on citric acid for use as a neutralizing agent in the automated reprocessing of medical instruments after the use of an alkaline product in the cleaning step. The acidic pH value of THERMOSHIELD C keeps instruments and machines free of inorganic deposits and, in particular, limescale residues. By using THERMOSHIELD C in the neutralization step, particularly sensitive materials can be protected and alkali residues carried over from the cleaning step can be avoided.

| Application and dosing recommendation for cleaning | |
|---|---|
| For neutralization, depending on pH value and water hardness | 1 – 3 ml/L (0,1 – 0,3 %) |

**Composition - 100 g solution contains**

Organic acids

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Flat canister | 3 | 5 L | 00-180-050 |



# THERMOSHIELD® P

## Neutralizing agent for automated reprocessing

- **Based on phosphoric acid**
- **Maintaining the value of instruments through basic cleaning**
- **Prevents inorganic deposits**

THERMOSHIELD P is a liquid concentrate based on phosphoric acid for use as a neutralizing agent in the automated reprocessing of medical instruments. After using an alkaline product such as THERMOSHIELD BASIX or THERMOSHIELD XTREME in the cleaning step, THERMOSHIELD P ensures efficient neutralization. THERMOSHIELD P is particularly suitable for use with hard water. It keeps instruments and machines free of inorganic deposits and, in particular, limescale residues. Inorganic, acid-soluble deposits and discoloration are easily removed, making THERMOSHIELD P ideal for basic cleaning.

| Application and dosing recommendation for cleaning | |
|---|---|
| For neutralization, depending on pH value and water hardness | 1 – 3 ml/L (0,1 – 0,3 %) |

| Composition - 100 g solution contains |
|---|
| Inorganic and organic acids |

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Flat canister | 3 | 5 L | 00-181-050 |

# THERMOSHIELD® SHINE

## Rinse aid for automated reprocessing

- **Time saving due to fast drying**
- **Acidic pH value prevents limescale build-up and deposits**
- **Maintaining the quality of the instruments**

THERMOSHIELD SHINE is a liquid concentrate for use as a rinse aid in washer-disinfectors and washer-disinfectors for the reprocessing of medical and dental instruments and medical devices. It is used for final rinsing and dosing is carried out automatically via the dosing pump or via the rinse aid compartment of the washer-disinfector or washer-disinfector. Thanks to its acidic pH value, THERMOSHIELD SHINE prevents the formation of deposits on the instruments and in the machine. The rapid drying behavior with THERMOSHIELD SHINE prevents the formation of water stains and saves time in the reprocessing process.

| Application and dosing recommendation for cleaning | |
|---|---|
| For rinsing, depending on pH value and water hardness | 0,1 – 0,3 ml/L (0,01 – 0,03 %) |

| Composition - 100 g solution contains |
|---|
| Organic acids |
| < 5 % non-ionic surfactants |

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Bottle | 12 | 1 L | 00-182-010 |
| Flat canister | 3 | 5 L | 00-182-050 |


# THERMO CLEAR

## Special rinse aid for thermal bedpan machines

- **Prevents limescale build-up on bedpan sinks**
- **Promotes residue-free drying of the wash ware**
- **Low foam**

THERMO CLEAR is suitable for the acidic thermal treatment of sockets in thermal bedpan sinks. It ensures residue-free drying of the wash ware, prevents calcification of the bedpan sinks and is very low-foaming. THERMO CLEAR is biodegradable in accordance with the German Detergents Ordinance as it is based on citric acid.

| Application and dosing recommendation for cleaning | |
|---|---|
| Depending on the type of machine and water hardness. | 1 – 3 ml/L (see manufacturer's instructions) (0,1 – 0,3 %) |

| Composition - 100 g solution contains |
|---|
| < 30 % organic acids |
| Complexing agent |
| Corrosion inhibitors |

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Flat canister | 3 | 5 L | 00-127-050 |
| Canister | 3 | 5 L | 00-127-050AT |


# SPEZIAL ÖLSPRAY

## Lubricating spray for instruments

- **Based on medicinal white oils**
- **For instrument care before steam sterilization**
- **Optimum lubrication of moving parts**

SPEZIAL ÖLSPRAY is a care spray for medical instruments, especially for articulated instruments such as joints and stopcocks of rigid endoscopes. The special spray valve ensures a fine, even protective film. This ensures the high steam permeability of SPEZIAL ÖLSPRAY and allows safe and effective sterilization in the steam sterilizer. SPEZIAL ÖLSPRAY increases the value retention of materials through optimum lubrication of moving parts and effective corrosion protection. Due to the use of pure medical white oils, SPEZIAL ÖLSPRAY is extremely material-compatible and toxicologically safe according to pharmaceutical and food legislation.

| Composition |
|---|
| Medicinal white oil according to DAB 10 (Paraffinum liquidum) |
| Propane/butane propellant |

| Container | PU | Contents | Art. Nr. |
|---|---|---|---|
| Spray can | 12 | 500 ml | 00-108-005 |

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