

VAH LIST OF DISINFECTANTS

A list of procedures issued by the Disinfectants Commission in the Association for Applied Hygiene (VAH) in collaboration with the Scientific Societies and Professional Associations DGHM, DGKH, GHUP and BVÖGD tested according to the DGHM Standard Methods for Testing Chemical Disinfection Processes and deemed to be effective for prophylactic disinfection and hygienic handwash

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General Information

This List is an inventory of all procedures which had a valid certificate as of 1st April 2015. The exact validity dates can be directly requested from the manufacturer or can be viewed in VAH's interactive database at www.vah-online.de.

Issuance of certificates and listing of disinfection procedures were carried out by the Disinfectants Commission in the Association for Applied Hygiene (Verbund für Angewandte Hygiene e. V. (VAH) (Prof. M. Exner, M. D., Chairman; Department of Hygiene, Bonn University, Sigmund-Freud-Strasse 25, 53127 Bonn, Germany). The List is compiled by the Association for Applied Hygiene in collaboration with the following scientific societies and professional associations: German Society for Hygiene and Microbiology (DGHM), German Society for Hospital Hygiene (DGKH), German Society of Hygiene, Environmental and Public Health Sciences (GHUP), German Federal Association of Physicians in Public Health (BVÖGD) and in cooperation with the German Association for Controlling Viral Diseases (DVV).

The certificates were issued on the basis of two expert opinions that provided proof of the disinfectant action of the preparation in the specified concentrations and for the contact times given for the respective application. These expert opinions were reviewed by the Commission and accepted if they met the provisions of the guidelines formulated by the Disinfectants Commission [1, 2], the Catalogue of Requirements [3] or the transitional provisions [4] as well as pertinent communications on test requirements published in the journal "Hygiene & Medizin".

The "DGHM Standard Methods for Testing Chemical Disinfection Processes" [2] were published reflecting the valid status as per 1 September 2001. The evaluation details for test results conducted as per these Standard Methods are summarised in the "Catalogue of Requirements for Including Chemical Disinfection Processes in the DGHM List of Disinfectants"; Issue: 4 February 2002 [3]. This approach meant that the stock of knowledge valid at that time and the methods based on European standardization endeavours in CEN TC 216 were integrated into the activities of the Disinfectants Commission and extended by the principle of efficacy limit value ascertainment. But continuously bringing these methods into line with the

prevailing state of knowledge in Europe also meant that the disinfection processes are now evaluated differently, especially those products used for surface and instrument disinfection. Adaptation to European standards ushered in test challenges (clean and dirty conditions) as well as other test organisms for the current test methods.

As of 1 January 2011 only those procedures are listed for which proof of at least two complete test reports and expert report could be furnished according to the Catalogue of Requirements from 2002 [3] or which had furnished proof of efficacy in a supplementary test protocol [4, 5].

The preparations are listed solely on the basis of the criteria specified above. Registration and licensing procedures, such as those stipulated by the German Medicinal Products Act (AMG) or the German Medical Devices Act (MPG), were not taken into consideration.

The manufacturers or distributors have issued binding statements that the preparations are marketed only in the formulations in which they were tested for acceptance in the List.

This List of Disinfectants serves as the basis for selection of appropriate disinfection procedures for routine and prophylactic disinfection to prevent infections in hospitals, medical and dental surgeries, public areas (children's daycare centres, schools, sporting establishments, etc.) and other areas in which infections may be transmitted. By using VAH listed products, establishments meet the quality assurance requirements stipulated by infection control regulations at state (Länder) level.

For statutorily mandated disinfection procedures, please consult the Infection Control Act (IfSG) of 20 July 2000 [6] (amended/revised as of 20 April 2013) and the List of Disinfectants of the Robert Koch Institute (RKI) (www.rki.de) [7].

Members of the Disinfectants Commission

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In the interest of standardisation, the VAH List takes account only of the disinfectant ingredients as declared by the manufacturer. To facilitate orientation, the products are classified according to the following active substance groups: aldehydes, aldehyde releasing agents, alcohols, alkylamines or alkylamine derivatives, amphoteric, compounds releasing chlorine, bromine or iodine, chloramines, glycol derivatives, guanidines or guanidine derivatives, bases, peroxide acids, peroxide compounds, phenol derivatives, phenol ethers, pyridine derivatives, quaternary compounds, inorganic acids, organic acids or heavy metal compounds. The active ingredients and the trademark symbols® are listed according to the specifications of the manufacturers and distributors. The annex to this List provides information on the spectrum of action of the active substances as well as on the nomenclature.

The manufacturers or distributors are required to declare on the label the quantity of each active ingredient.

The listing of a preparation applies only to the specified application process. Any change of the formulation of a listed product must be reported to the head office of the Disinfectants Commission. In such cases the Commission will decide whether, and to what extent, new tests are required.

The Disinfectants Commission reserves the right to undertake further tests if new developments in the testing methodology or regarding the efficacy of particular products come to light. Moreover, it reserves the right to withdraw the corresponding certificate in the event of evidence of no, or insufficient, efficacy.

When their products are accepted, the manufacturers and distributors are required to state the listed disinfection values on the label, in the instructions for use, and in advertising prospectuses if they make reference to testing according to the "Guidelines" or "Standard Methods" ("tested and found effective") or to the List. Reference may be made to the "Guidelines" or "Standard Methods" only if the specified concentration/contact-time relationships are in agreement with the "Requirements" [2]. Testing of the listed processes refers only to the disinfectant action. No statements are made about other characteristics of the products, such as skin compatibility, corrosive or cleansing effects.

The disinfectant action of many preparations is impaired in the presence of organic material (e.g., blood, wound secretions, mucus). Therefore the recommendations given here for the respective applications must not be unconditionally applied to other procedures, such as mucous membranes and wound antisepsis or irrigation of body cavities.

As a general rule, freshly prepared working solutions must be used, if they are not available as 'ready-to-use products'. This rule must always be observed for disinfectants based on peroxide compounds and for chlorine releasing agents since they are not stable (follow instructions given by the manufacturer).

If chlorine-releasing solutions are produced by means of membrane cell electrolysis at the site of use, the manufacturer has to ensure that the product will correspond to the same quality which formed the basis for the two test reports and

whose efficacy has been confirmed by both reviewing experts.

The concentrations specified in the List must be exactly observed. Under no circumstances should what is known as a 'shot method' be used. Nor should users add a detergent, e. g. soap or wash-active substances, to the disinfectant at their own discretion (soap effects).

All products published in the VAH List are bactericidal and, hence, also effective against methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant enterococci (VRE), or multiresistant Gram-negative rods (MRGN). Although the underlying resistance mechanisms do have an impact on the efficacy of antibiotics, they do not influence the activity of disinfectants which are used in microbicidal concentrations [8]. Consequently, VAH-certified concentration/contact time ratios are effective when used as prescribed. In certain situations (e.g. in the event of the cumulated incidence of infections by specific pathogens) the Disinfectants Commission will conduct tests with these bacteria as test organisms in order to ensure that the concentration/contact time ratios listed are also effective in these instances.

Cleaning and Disinfection Procedures

The List is divided into the following sections on the basis of practical requirements:

– Hygienic Handwash

Disinfection procedures:

– Hand disinfection

– Skin antisepsis

– Surface disinfection

– Instrument disinfection

– Linen disinfection

Detailed information on the test criteria for the individual procedures is given in the respective section.

Listing Antiviral Properties in the VAH List of Disinfectants

The Disinfectants Commission has received numerous questions over the last years concerning the application of suitable disinfection procedures in the event of viral infections. On a national and European level great efforts have been made in order to advance and standardize methods for evaluating disinfectants by means of quantitative suspension tests as well as with tests simulating practical conditions. As a result, test requirements will be extended and modified in the upcoming years.

With listing antiviral properties in the present VAH List, the user will be provided with the necessary information to make a choice for a suitable disinfectant which has proven efficacy for limited spectrum and/or full virucidal activity according to the current state-of-the-art quantitative suspensions tests.

If requested by the manufacturer, the test protocols and test reports of the products listed were assessed by independent experts. The conformity assessment procedure mainly fol-

lowed the bylaws of the DVV Disinfectants Commission, item 4a. Listing antiviral properties required the submission of at least one test protocol/expert report according to the current DVV/RKI guidelines of 2005, 2008, 2015 [9, 10, 11, 12]. If new test methods are established and integrated in the conformity assessment procedure, this will be taken into consideration in the prefaces of the pertinent field of application.

Currently, antiviral activity is divided into limited virucidal activity and virucidal activity. Virucidal activity comprises the spectrum of both enveloped and non-enveloped viruses. For this claim, testing against poliovirus type 1, adenovirus type 5, polyomavirus SV40 and murine norovirus (MNV) is required. Limited virucidal activity is confirmed for proven efficacy against the enveloped test viruses bovine viral diarrhea virus and vaccinia virus (or Modified Vaccinia Virus, MVA, respectively).

In the VAH List of Disinfectants products with antiviral properties are specially marked. Independent of the concentration/contact time ratios stated for antiviral efficacy, the values necessary for bactericidal efficacy are stated as minimum requirements. If virucidal and/or limited virucidal activity require higher concentration/contact time ratios, these are separately listed.

Table 1, listing selected relevant viruses and/or viral diseases, provides the user with information on the viruses which are covered by the efficacy tests performed with the corresponding test viruses.

References

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Table 1: Test viruses for efficacy testing of disinfectants and selected viruses covered by these viruses.

	Test Virus	Spectrum of Virucidal Activity (Examples) ^{1, 2}
Virucidal (non-enveloped viruses and enveloped viruses)	<p>Adenovirus (Adenovirus Typ 5, strain Adenoid 75) <i>non-enveloped</i></p> <p>Minute Virus of Mice (MVM) Murine Parvovirus <i>non-enveloped</i></p> <p>Poliovirus (Poliovirus Typ I, strain LSc-2ab) <i>non-enveloped</i></p> <p>Polyomavirus SV40 (Simianvirus 40, strain 777) <i>non-enveloped</i></p> <p>Murine Norovirus (MNV - strain S99 Berlin) <i>non-enveloped</i></p>	<p>Causative organisms of viral gastrointestinal infections</p> <ul style="list-style-type: none"> – Adenovirus serotypes 40 and 41 – Norovirus – Rotavirus <p>Causative organism of respiratory infections</p> <ul style="list-style-type: none"> – Adenovirus serotype 7 <p>Causative organisms of keratoconjunctivitis</p> <ul style="list-style-type: none"> – Adenovirus serotypes 8, 19 and 37 <p>Papillomaviridae</p> <p>Parvoviruses</p> <ul style="list-style-type: none"> – Parvovirus B19 – Bocavirus <p>Picornaviridae</p> <ul style="list-style-type: none"> – Enteroviruses: Coxsackie, Echo, Polioviruses, Rhinoviruses (Human rhinovirus) – Hepatovirus: Hepatitis A virus (HAV) ³ – Parechoviruses: Echovirus 22 and 23
Limited Virucidal Activity (enveloped viruses)	<p>BVDV* (Bovine Viral Diarrhea Virus) *surrogate virus for Hepatitis C Virus <i>enveloped</i></p> <p>Vaccinia virus (strain Elstree and/or MVA) <i>enveloped</i></p>	<p>Causative organism of blood-borne infections</p> <ul style="list-style-type: none"> – Hepatitis B virus (HBV) – Hepatitis C virus (HCV) – Human Immunodeficiency Virus (HIV) <p>Causative organisms of respiratory infections</p> <ul style="list-style-type: none"> – Human coronavirus (HCoV) 229E and OC43 – Influenza virus A (e.g. H1N1, H3N2) and B – Metapneumoniavirus – Respiratory Syncytial Virus (RSV) <p>Causative organisms of travel-associated infections</p> <ul style="list-style-type: none"> – Bunyavirus (Sandfly Fever) – Dengue virus, Ebola virus, Yellow fever virus, Hantaanvirus, Lassa virus, Marburg virus – Krim Kongo haemorrhagic viral fever – FSME virus – Rabies virus – SARS-CoV, MERS-CoV – West Nile virus (West-Nile-Fever) <p>Herpesviridae</p> <ul style="list-style-type: none"> – Cytomegalievirus (CMV) – Herpes-simplex-viruses type 1 and 2 (HSV-1, HSV-2) – Epstein-Barr virus (EBV) – Varizella-Zoster-Virus (VZV) <p>Paramyxoviruses</p> <ul style="list-style-type: none"> – Measles virus – Mumps virus <p>Rubella virus</p>
Chemo-thermal Linen Disinfection	<p>Bovine parvovirus <i>non-enveloped</i></p> <p>or</p> <p>Minute Virus of Mice (MVM, murine parvovirus) <i>non-enveloped</i></p>	<p>Please refer to virucidal and limited virucidal activity</p>

Restrictions:

1. This classification can only serve as an orientation, since there is an interdependency with the active ingredient and the effect cannot always be assessed.
2. Currently efficacy tests for antiviral activity are largely based on quantitative suspension tests only. Consequently, conclusions on the efficacy on surfaces in practical use conditions can only be made with restrictions.
3. A possible restriction of virucidal effectiveness on HAV and parvovirus is mentioned in the Guideline [9].