



Transducer and System Care and Cleaning

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PHILIPS

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Contents

Transducer Care Overview

Transducers require proper care, cleaning, and handling. These pages contain information and instructions to help you effectively clean, disinfect, and sterilize the transducers that are compatible with your Philips ultrasound system. Additionally, these instructions help avoid damage during cleaning, disinfection, and sterilization, which could void your warranty.

Reasonable care includes inspection, cleaning, and disinfection or sterilization, as necessary. Transducers must be cleaned after each use. Inspect all parts of the transducer carefully before each use. Check for cracks or other damage that jeopardizes the integrity of the transducer. Report any damage to your Philips representative, and discontinue use of the transducer. For more information, see your system *User Manual*, which contains information that is specific to your system and transducers.

The following topics explain how to clean and disinfect your Philips Ultrasound transducers and systems.

Care and Cleaning Topics

Cleaning and Disinfecting Transducers	Disinfectants	Related Care Information
<ul style="list-style-type: none"> • “Choosing the Correct Transducer Care Method” on page 6 • “Transducer Care and Operator Safety” on page 10 • “Cleaning, Disinfecting, and Sterilizing Non-TEE Transducers” on page 15 • “Cleaning, Disinfecting, and Sterilizing TEE Transducers” on page 25 	<ul style="list-style-type: none"> • “About Disinfectants” on page 34 • “Choosing Disinfectants and Cleaning Solutions” on page 35 	<ul style="list-style-type: none"> • “System Maintenance” on page 37 • “Ultrasound Transmission Gels” on page 43 • “Transducer Storage and Transport” on page 44 • “Supplies, Accessories, and Customer Service” on page 45

Choosing the Correct Transducer Care Method

To choose an appropriate care method for your transducer, you first must determine the classification of the transducer, based on its use (see table). The care method for your transducer determines the appropriate disinfectant for your transducer. For details about compatible disinfectants, see [“Disinfectants” on page 34](#). Always follow the manufacturer’s instructions when using disinfectants and cleaning solutions.

Transducers *must* be cleaned after each use. Cleaning the transducer is an essential step before effective disinfection or sterilization.

Cleaning Methods

Non-TEE Transducer Use	Example	Classification	Care Method
Contacts intact skin	Curved, linear, xMatrix, and sector transducers	Noncritical	“Low-Level Disinfection of Non-TEE Transducers” on page 19
Contacts mucous membranes	Endocavity	Semi-critical	“High-level Disinfection of Non-TEE Transducers” on page 20
Enters otherwise sterile tissue	Intraoperative and laparoscopic	Critical	“High-level Disinfection of Non-TEE Transducers” on page 20 ¹ OR “Sterilization of Non-TEE Transducers” on page 23
TEE Transducer Use	Example	Classification	Care Method
Contacts mucous membranes	Transesophageal (TEE)	Critical	“High-Level Disinfection of TEE Transducers” on page 28 ¹ OR “Sterilization of TEE Transducers” on page 31

1 High-level disinfection and the use of a sterile gel and a transducer cover, as described in the instructions provided with the transducer cover, is an accepted method of infection control for ultrasound transducers. See the FDA Guidance document “Information for Manufacturers Seeking Marketing Clearance of Diagnostic Ultrasound Systems and Transducers,” updated September 9, 2008, at the following website: www.fda.gov/downloads/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/UCM070911.pdf.

NOTE

All imaging transducers are rated at a minimum IPX7 in accordance with IEC 60529, “Degrees of Protection Provided by Enclosures (IP code).” This rating indicates that the device is protected against the effects of immersion. Continuous wave (non-imaging) transducers are rated IPX1. This rating indicates that the device is protected against the effects of vertically falling water. For all TEE transducers, the control module is rated IPX1, while the endoscope is rated IPX7, in accordance with IEC 60529.

Warnings and Cautions

These warnings and cautions must be observed during all cleaning, disinfection, and sterilization procedures.



WARNINGS

- **Always use protective eyewear and gloves when cleaning and disinfecting any equipment.**
- **If a pre-mixed solution is used, be sure to observe the solution expiration date.**
- **Transducers must be cleaned after each use. Cleaning the transducer is an essential step before effective disinfection or sterilization. Be sure to follow the manufacturer’s instructions when using disinfectants.**



CAUTIONS

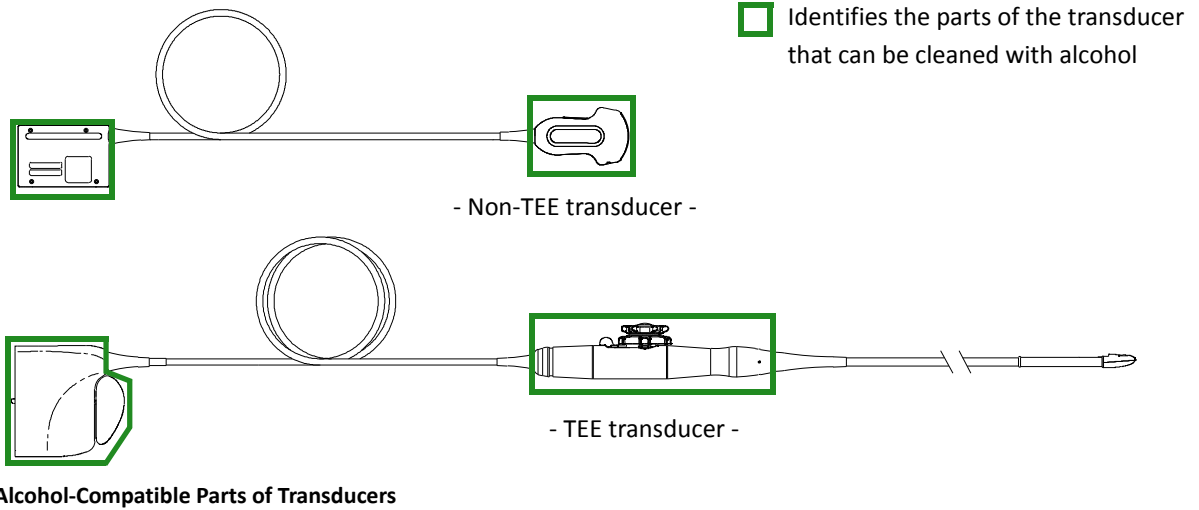
- **Attempting to clean or disinfect a transducer, cable, or connector by using a method other than the procedures on this website can damage the device and voids the warranty.**
- **Do not allow sharp objects, such as scalpels or cauterizing knives, to touch transducers or cables.**
- **When handling a transducer, do not bump the transducer on hard surfaces.**
- **On TEE transducers, do not bend or crimp the gastroscope (flexible shaft) or cable.**
- **Do not use a surgeon’s brush when cleaning transducers. Even the use of soft brushes can damage transducers.**
- **Do not use a brush on the connector label.**



CAUTIONS

- Do not use paper products or products that are abrasive when cleaning the transducer. They damage the soft lens of the transducer.
- During cleaning, disinfection, and sterilization, orient the parts of the transducer, connector, or cable that must remain dry higher than the wet parts, until all parts are dry. This helps keep liquid from entering unsealed areas of the transducer.
- Do not allow any type of fluid to enter the connector. Ensure that fluid does not enter through the strain relief, through the connector, through the electrical contacts, or through the areas surrounding the locking-lever shaft and the strain relief. Fluid in the connector may void the device warranty.
- Be sure to use the proper concentration of enzymatic cleaner and rinse thoroughly.
- Before storing transducers, ensure that they are thoroughly dry. If it is necessary to dry the transducer lens after cleaning, use a soft cloth and a blotting motion, instead of a wiping motion.
- The use of 70% isopropyl alcohol (rubbing alcohol) and alcohol-based products on all transducers is restricted. On non-TEE transducers, the only parts that may be cleaned with isopropyl alcohol are the connector housing and the transducer housing and lens. On TEE transducers, the only parts that may be cleaned with isopropyl alcohol are the connector housing and the handle. Ensure that the solution is only 70% alcohol or less. Do not wipe any other part of a transducer with isopropyl alcohol (including cables or strain reliefs), as it can damage those parts of the transducer. This damage is not covered by the warranty or your service contract.

Choosing the Correct Transducer Care Method



Transducer Care and Operator Safety

Observe the following warnings when using disinfectants. More specific warnings and cautions are included within the care and cleaning procedures and on the labels of the cleaning or disinfection solutions.



WARNINGS

- **Disinfectants are recommended because of their chemical compatibility with product materials, not their biological effectiveness. For the biological effectiveness of a disinfectant, see the guidelines and recommendations of the disinfectant manufacturer, the U.S. Food and Drug Administration, and the U.S. Centers for Disease Control.**
- **The level of disinfection required for a device is dictated by the type of tissue it will contact during use and the type of transducer being used. Ensure that the disinfectant type is appropriate for the type of transducer and the transducer application. For information on the levels of disinfection requirements, see [“Choosing the Correct Transducer Care Method” on page 6](#). Also, see the disinfectant label instructions and the recommendations of the Association for Professionals in Infection Control, the U.S. Food and Drug Administration, and the U.S. Centers for Disease Control.**
- **Sterile transducer covers with sterile ultrasound transmission gel are required for intraoperative and biopsy procedures. Protective covers are recommended for transrectal and intravaginal procedures; in China and Japan, the covers are mandatory. Philips recommends the use of qualified covers.**
- **In intraoperative applications (other than TEE or endoscopy), transducers used with sterile gel and sterile transducer covers may use either the high-level disinfection or sterilization care method.**
- **Bite guards are mandatory for TEE transducers.**

For information on ordering transducer covers, bite guards, and other supplies, contact CIVCO Medical Solutions (see [“Supplies and Accessories” on page 45](#) and [“Customer Service” on page 45](#)).

Latex Product Alert

Philips ultrasound systems and transducers do not contain natural rubber latex that contacts humans. Natural rubber latex is not used on any ultrasound transducer, including transthoracic, intraoperative, and

transesophageal echocardiography (TEE) transducers. It also is not used on Philips ECG cables for ultrasound products.



WARNINGS

- **Transducer covers can contain natural rubber latex, which may cause allergic reactions in some individuals.**
- **The M2203A bite guard strap contains natural rubber latex, which may cause allergic reactions.**

FDA Medical Alert on Latex

March 29, 1991, Allergic Reactions to Latex-Containing Medical Devices

Because of reports of severe allergic reactions to medical devices containing latex (natural rubber), the FDA is advising health care professionals to identify their latex sensitive patients and be prepared to treat allergic reactions promptly. Patient reactions to latex have ranged from contact urticaria to systemic anaphylaxis. Latex is a component of many medical devices, including surgical and examination gloves, catheters, intubation tubes, anesthesia masks, and dental dams.

Reports to the FDA of allergic reactions to latex-containing medical devices have increased lately. One brand of latex cuffed enema tips was recently recalled after several patients died as a result of anaphylactoid reactions during barium enema procedures. More reports of latex sensitivity have also been found in the medical literature. Repeated exposure to latex both in medical devices and in other consumer products may be part of the reason that the prevalence of latex sensitivity appears to be increasing. For example, it has been reported that 6% to 7% of surgical personnel and 18% to 40% of spina bifida patients are latex sensitive.

Proteins in the latex itself appear to be the primary source of the allergic reactions. Although it is not now known how much protein is likely to cause severe reactions, the FDA is working with manufacturers of latex-containing medical devices to make protein levels in their products as low as possible.

FDA's recommendations to health professionals in regard to this problem are as follows:

- When taking general histories of patients, include questions about latex sensitivity. For surgical and radiology patients, spina bifida patients and health care workers, this recommendation is especially important. Questions about itching, rash or wheezing after wearing latex gloves or inflating a toy balloon may be useful. Patients with positive histories should have their charts flagged.

- If latex sensitivity is suspected, consider using devices made with alternative materials, such as plastic. For example, a health professional could wear a non-latex glove over the latex glove if the patient is sensitive. If both the health professional and the patient are sensitive, a latex middle glove could be used. (Latex gloves labeled “Hypoallergenic” may not always prevent adverse reactions.)
- Whenever latex-containing medical devices are used, especially when the latex comes in contact with mucous membranes, be alert to the possibility of an allergic reaction.
- If an allergic reaction does occur and latex is suspected, advise the patient of a possible latex sensitivity and consider an immunologic evaluation.
- Advise the patient to tell health professionals and emergency personnel about any known latex sensitivity before undergoing medical procedures. Consider advising patients with severe latex sensitivity to wear a medical identification bracelet.

The FDA is asking health professionals to report incidents of adverse reactions to latex or other materials used in medical devices. (See the October 1990 FDA Drug Bulletin.) To report an incident, contact the FDA Problem Reporting Program, MedWatch, at 1-800-332-1088, or on the Internet:

www.fda.gov/Safety/MedWatch/

For a single copy of a reference list on latex sensitivity, write to: LATEX, FDA, HFZ-220, Rockville, MD 20857.

Transmissible Spongiform Encephalopathy



WARNING

If a sterile transducer cover becomes compromised during an intraoperative application involving a patient with transmissible spongiform encephalopathy, such as Creutzfeldt-Jakob disease, follow the guidelines of the U.S. Centers for Disease Control and this document from the World Health Organization: WHO/CDS/ APH/2000/3, *WHO Infection Control Guidelines for Transmissible Spongiform Encephalopathies*. The transducers for your system cannot be decontaminated using a heat process.

Infection Control

Issues related to infection control affect the operator and the patient. Follow the infection control procedures established in your facility for the protection of both the staff and the patients.

Handling Contaminated Transducers

The primary area of concern is the handling of transducers that have contacted infected patients. Always wear gloves when you handle transducers used in TEE, endocavity, intraoperative, and biopsy procedures that have not been previously disinfected.

For information on cleaning and disinfecting transducers, see [“Transducer Care Overview” on page 5](#).

Removing Blood and Infectious Material from the System



CAUTION

The use of 70% isopropyl alcohol (rubbing alcohol) and alcohol-based products on all transducers is restricted. On non-TEE transducers, the only parts that may be cleaned with isopropyl alcohol are the connector housing and the transducer housing and lens. On TEE transducers, the only parts that may be cleaned with isopropyl alcohol are the connector housing and the handle. Ensure that the solution is only 70% alcohol or less. Do not wipe any other part of a transducer with isopropyl alcohol (including cables or strain reliefs), as it can damage those parts of the transducer. This damage is not covered by the warranty or your service contract.

Use a gauze pad moistened with soap and water to remove blood on the system and the transducer connectors and cables. Then dry the equipment with a soft cloth to prevent corrosion. You can use a 70% solution of isopropyl alcohol on the system and on limited parts of some transducers as noted above.

Additional cleaning agents are available for transducers. For more information, see [“Transducer Care Overview” on page 5](#). For more information about removing blood and other infectious material from the system, see [“Disinfecting System Surfaces” on page 40](#).

Disposable Drape

If you believe contamination of the system might occur during an exam, Philips recommends that you take universal precautions and cover the system with a disposable drape. Consult your facility's rules regarding equipment use in the presence of infectious disease.



CAUTION

Position the disposable drape so that it does not block the vents on the system, the monitors, or the peripherals.

Transducer Covers

To prevent contamination by blood-borne pathogens, sterile transducer covers are required for intraoperative and biopsy procedures; in China, sterile covers are also required for transrectal, intravaginal, and transesophageal procedures. Protective covers are recommended for transrectal, intravaginal, and transesophageal procedures; the protective covers are mandatory in China and Japan. Philips recommends the use of qualified covers. For procedures for using transducer covers, see the instructions provided with the covers.



WARNINGS

- **Latex and talc are commonly used in transducer covers marketed to help with infection control in transesophageal, endocavity, and intraoperative imaging applications and during biopsies. Examine the packaging to confirm latex and talc content. Studies have shown that patients can experience allergic reactions with natural rubber latex. See the FDA Medical Alert, March 29, 1991, reprinted in [“FDA Medical Alert on Latex”](#) on page 11.**
- **In intraoperative applications, sterilized transducers should be used with sterile gel and a sterile transducer cover.**
- **Do not apply the transducer cover until you are ready to perform the procedure.**
- **Inspect transducer covers before and after use.**
- **If the sterile transducer cover becomes compromised during an intraoperative application involving a patient with Creutzfeldt-Jakob disease, follow the recommendations described in [“Transmissible Spongiform Encephalopathy”](#) on page 12.**



WARNINGS

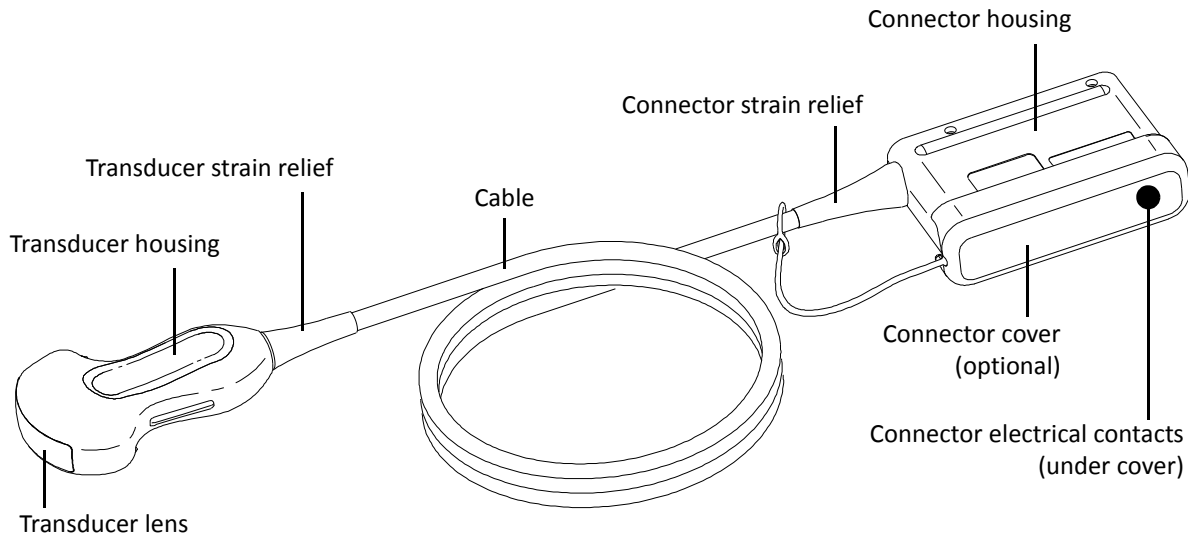
- **Transducer covers are disposable and must not be reused.**
- **If an installed transducer cover is cut or contaminated before use, the probe should be cleaned and disinfected or sterilized, and a new sterile cover installed.**

Cleaning, Disinfecting, and Sterilizing Non-TEE Transducers

The following topics explain how to clean, disinfect, and sterilize non-TEE transducers. To determine the appropriate care method for your transducer, see [“Choosing the Correct Transducer Care Method” on page 6.](#)

For TEE transducer care instructions, see [“Cleaning, Disinfecting, and Sterilizing TEE Transducers” on page 25.](#)

All transducers *must* be cleaned after each use. Cleaning the transducer is an essential step before effective disinfection or sterilization. The following figure identifies the components of non-TEE transducers.



Non-TEE Transducer Components

Cleaning Non-TEE Transducers, Cables, and Connectors

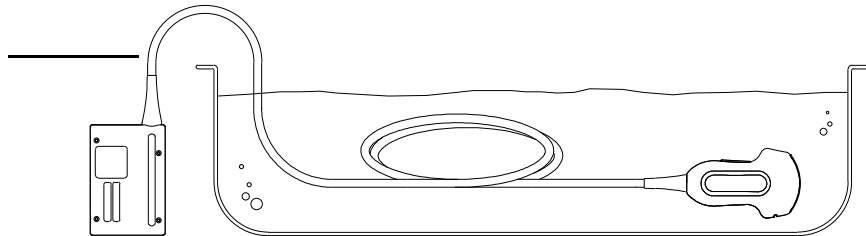
These general cleaning instructions must be followed for all non-TEE transducers, cables, and connectors.

Before cleaning a transducer, read [“Warnings and Cautions” on page 7](#) and [“Transducer Care and Operator Safety” on page 10](#). After cleaning, you must disinfect or sterilize non-TEE transducers by following the appropriate procedures: [“Low-Level Disinfection of Non-TEE Transducers” on page 19](#), [“High-level Disinfection of Non-TEE Transducers” on page 20](#), or [“Sterilization of Non-TEE Transducers” on page 23](#).

1. After every patient study, use a moist cloth to remove the ultrasound transmission gel from the transducer.
2. Disconnect the transducer from the system, and remove any accessories attached to or covering the transducer. Push the connector cover, if available, onto the connector to protect against fluid splashing onto the contacts.

3. Use a soft cloth lightly dampened in a mild soap or an enzymatic cleaner (in accordance with the manufacturer's instructions) to remove any particulate matter or body fluids that remain on the transducer, cable, or connector. Enzymatic cleaners are generically approved for use.
4. When cleaning the connector, do not allow any type of fluid to enter through the strain relief, electrical contacts, or areas surrounding the locking-lever shaft and the strain relief. You may use a soft-bristled brush to clean *only* the metal surfaces of the connector.
5. When cleaning the lens, use a blotting motion rather than a wiping motion.
6. To remove remaining particulate and cleaning residue, use cleaning wipes according to the manufacturers' instructions, or rinse thoroughly with water up to the immersion point shown below. Do not immerse the connector, connector strain relief, or cable that is within 5 cm (2 in) of the strain relief.

Do not immerse beyond
this point, 5 cm (2 in)
from the strain relief



Immersion Point for Non-TEE Transducers

NOTE

If you use cleaning wipes, it may be unnecessary to rinse the transducer with water. Always follow the product label recommendations.

7. If necessary, wipe the transducer with a dry cloth. To dry the lens, use a soft cloth and a blotting motion instead of a wiping motion.
8. Examine the device and cable for damage such as cracks, splitting, sharp edges, or projections. If damage is evident, discontinue use of the device and contact your Philips representative.

Cleaning and Disinfecting Cables and Connectors

Use this procedure when you need to clean only cables or connectors for any type of transducer. You can disinfect the cables and connectors of all transducers with a wipe or spray disinfectant recommended for your transducer.


Before cleaning and disinfecting cables and connectors, read [“Warnings and Cautions” on page 7](#) and [“Transducer Care and Operator Safety” on page 10](#).

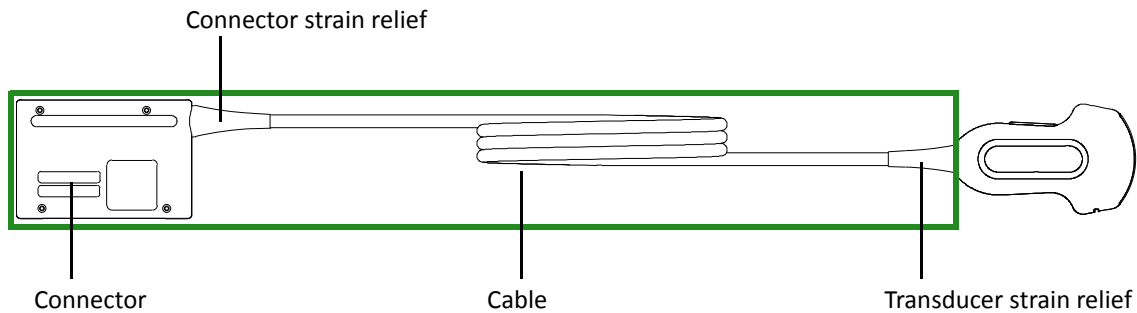


CAUTION

Do not bend or crimp the gastroscope (flexible shaft) or cable.

1. Disconnect the device from the system, and remove any accessories attached to or covering the transducer. Push the connector cover, if available, onto the connector to protect against fluid splashing onto the contacts.
2. Use a soft cloth lightly dampened in a mild soap or detergent solution to clean the cable, the strain reliefs, and the connector. A soft-bristled brush can be used to clean only the metal surfaces of the connector.
3. Choose the disinfection solution compatible with your cable and connector. For a list of compatible disinfectants, see the Web site for your Philips Ultrasound system. Follow the label instructions for preparation and solution strength. If a pre-mixed solution is used, be sure to observe the solution expiration date.
4. Wipe or spray the cable, strain relief, and connector with the disinfectant, following disinfectant label instructions for wipe durations, solution strengths, and duration of disinfectant contact with the cable. Ensure that the solution strength and duration of contact are appropriate for the intended clinical use of the device. Ensure that the disinfectant solution does not enter the device or the connector.

 Identifies the parts to wipe or spray



Disinfecting the Cable, Strain Reliefs, and Connector

5. Air dry or towel dry with a sterile cloth according to the instructions on the disinfectant label.
6. Examine the device and cable for damage such as cracks, splitting, sharp edges, or projections. If damage is evident, discontinue use of the device and contact your Philips representative.

Low-Level Disinfection of Non-TEE Transducers

Low-level disinfection of non-TEE transducers uses the spray or wipe method, with a low- or intermediate level disinfectant. Before disinfecting a transducer, read [“Warnings and Cautions” on page 7](#) and [“Transducer Care and Operator Safety” on page 10](#).

NOTE

Transducers can be disinfected using the wipe method only if the product labeling of the compatible disinfectant you are using indicates it can be used with a wipe method.

1. Clean the transducer according to the procedures in [“Cleaning Non-TEE Transducers, Cables, and Connectors” on page 16](#). Observe all warnings and cautions.
2. After cleaning, choose a low- or intermediate-level disinfection solution compatible with your transducer, cable, and connector. Follow the label instructions for preparation and solution strength. If a pre-mixed solution is used, be sure to observe the solution expiration date. For information on the

disinfectants compatible with non-TEE transducers, see the Philips Ultrasound Transducer Care website (www.healthcare.philips.com/us/products/ultrasound/transducers/transducer_care/).

3. Wipe or spray the transducer, cable, strain relief, and connector with the disinfectant, following disinfectant label instructions for wipe durations and duration of disinfectant contact. Ensure that the solution strength and duration of contact are appropriate for the intended clinical use of the device. Ensure that the disinfectant solution does not enter the device or the connector.
4. Air dry or towel dry with a sterile cloth according to the instructions on the disinfectant label.
5. Examine the device and cable for damage such as cracks, splitting, sharp edges, or projections. If damage is evident, discontinue use of the device and contact your Philips representative.

High-level Disinfection of Non-TEE Transducers

High-level disinfection of non-TEE transducers uses the immersion method. Before disinfecting a transducer, read [“Warnings and Cautions” on page 7](#) and [“Transducer Care and Operator Safety” on page 10](#).



WARNING

If a pre-mixed disinfectant is used, be sure to observe the expiration date.



CAUTIONS

- Always use protective eyewear and gloves when cleaning and disinfecting any equipment.
- Using non-recommended disinfectants, using incorrect solution strengths, or immersing a transducer deeper or longer than recommended can damage or discolor the transducer and voids the transducer warranty.
- Do not immerse transducers longer than the minimum time needed for your level of disinfection. For information on the levels of disinfection requirements, see [“Choosing the Correct Transducer Care Method” on page 6](#).

Isopropyl Alcohol Restrictions



CAUTION

The use of 70% isopropyl alcohol (rubbing alcohol) and alcohol-based products on all transducers is restricted. On non-TEE transducers, the only parts that may be cleaned with isopropyl alcohol are the connector housing and the transducer housing and lens. On TEE transducers, the only parts that may be cleaned with isopropyl alcohol are the connector housing and the handle. Ensure that the solution is only 70% alcohol or less. Do not wipe any other part of a transducer with isopropyl alcohol (including cables or strain reliefs), as it can damage those parts of the transducer. This damage is not covered by the warranty or your service contract.

Minimizing the Effects of Residual Disinfectant

If you use an OPA-based disinfectant, residual solution may remain on your transducers if you do not carefully follow the manufacturer's instructions.



WARNING

Residual OPA on TEE transducers may cause temporary staining of the mouth and lip area and irritation or chemical burns of the mouth, throat, esophagus, and stomach.

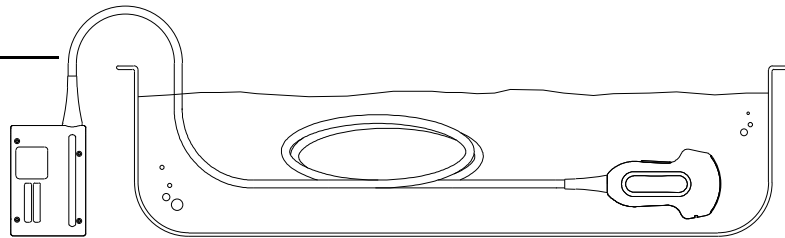
To minimize the effects from residual OPA, or any other disinfectant, Philips recommends the following:

- Follow the disinfectant manufacturer's instructions very carefully. For example, the manufacturer of Cidex OPA recommends soaking transducers three times in fresh water.
- Use a protective transducer cover during endocavity and TEE studies.
- Use a sterile protective transducer cover with sterile ultrasound transmission gel during intraoperative and biopsy studies.
- Limit the time that transducers are soaked in the disinfectant solution to the minimum time recommended by the disinfectant manufacturer (for example, the manufacturer of Cidex OPA recommends a minimum of 12 minutes).

Disinfecting Non-TEE Transducers by Immersion

1. Clean the transducer according to the procedures in “[Cleaning Non-TEE Transducers, Cables, and Connectors](#)” on [page 16](#). Observe all warnings and cautions.
2. After cleaning, choose a high-level disinfection solution compatible with your transducer. Follow the label instructions for preparation and solution strength. If a pre-mixed solution is used, be sure to observe the solution expiration date. For information on disinfectant compatibility, see the Philips Ultrasound Transducer Care website (www.healthcare.philips.com/us/products/ultrasound/transducers/transducer_care/).
3. Immerse the transducer into the appropriate disinfectant for your transducer as shown in the illustration. Do not immerse the connector, connector strain relief, or cable that is within 5 cm (2 in) of the strain relief.

Do not immerse beyond
this point, 5 cm (2 in)
from the strain relief



Immersion Point for Non-TEE Transducers

4. Follow the instructions on the disinfectant label for the duration of transducer immersion. Do not immerse transducers longer than the minimum time needed for your level of disinfection.
5. Using the instructions on the disinfectant label, rinse the transducer up to the point of immersion. Do not immerse the connector, connector strain relief, or cable that is within 5 cm (2 in) of the strain relief.
6. Using an appropriate disinfectant for the cable and connector, wipe or spray the cable, strain relief, and connector, following disinfectant label instructions for wipe durations, solution strengths, and duration of disinfectant contact. Ensure that the solution strength and duration of contact are appropriate for the intended clinical use of the device. Ensure that the disinfectant solution does not enter the device or the connector.

7. Air dry or towel dry with a sterile cloth according to the instructions on the disinfectant label.
8. Examine the transducer for damage, such as cracks, splitting, fluid leaks, or sharp edges or projections. If damage is evident, discontinue use of the transducer and contact your Philips representative.

Sterilization of Non-TEE Transducers

Sterilization is required if the transducer enters otherwise sterile tissue without a sterile cover. If you use a sterile cover, you should sterilize, but you can disinfect (high-level disinfection). The main difference between sterilization and disinfection by immersion is the length of time the transducer is immersed. For information about disinfecting a non-TEE transducer, see [“High-level Disinfection of Non-TEE Transducers” on page 20](#).

To determine if your transducer requires sterilization or high-level disinfection, see [“Choosing Disinfectants and Cleaning Solutions” on page 35](#).

Before sterilizing a transducer, read [“Warnings and Cautions” on page 7](#) and [“Transducer Care and Operator Safety” on page 10](#).



WARNINGS

- **Always use protective eyewear and gloves when cleaning, disinfecting, or sterilizing any equipment.**
- **In intraoperative applications, sterilized transducers should be used with sterile gel and a sterile transducer cover.**
- **Sterile transducer covers are disposable and must not be reused.**
- **If a pre-mixed solution is used, be sure to observe the solution expiration date.**
- **Transducers must be cleaned after each use. Cleaning the transducer is an essential step before effective disinfection or sterilization. Be sure to follow the manufacturer’s instructions when using disinfectants.**



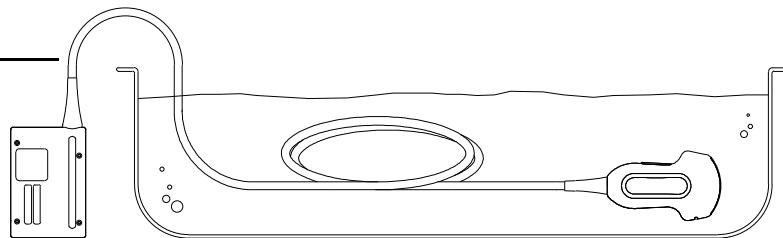
CAUTIONS

- Use only liquid solutions to sterilize transducers. Using autoclave, gas (EtO), or other methods not approved by Philips will damage your transducer and void your warranty.
- Do not allow sharp objects, such as scalpels and cauterizing knives, to touch transducers or cables.
- When handling a transducer, do not bump the transducer on hard surfaces.
- Ensure that the solution strength and duration of contact are appropriate for sterilization. Be sure to follow the manufacturer's instructions.

Sterilizing Non-TEE Transducers by Immersion

1. Clean the transducer and cable according to the procedures in [“Cleaning Non-TEE Transducers, Cables, and Connectors”](#) on page 16. Observe all warnings and cautions.
2. After cleaning, choose a sterilization solution that is compatible with your transducer, cable, and connector. Follow the label instructions for preparation and solution strength. If a pre-mixed solution is used, be sure to observe the solution expiration date. For information on the disinfectants that are compatible with non-TEE transducers, see the Philips Ultrasound Transducer Care website (www.healthcare.philips.com/us/products/ultrasound/transducers/transducer_care/).
3. Immerse the transducer in the sterilization solution as shown in the illustration. Do not immerse the connector, connector strain relief, or cable within 5 cm (2 in) of the strain relief.

Do not immerse beyond
this point, 5 cm (2 in)
from the strain relief



Immersion Point of Non-TEE Transducers

4. Follow the instructions on the sterilization label for the duration of transducer immersion required for sterilization.

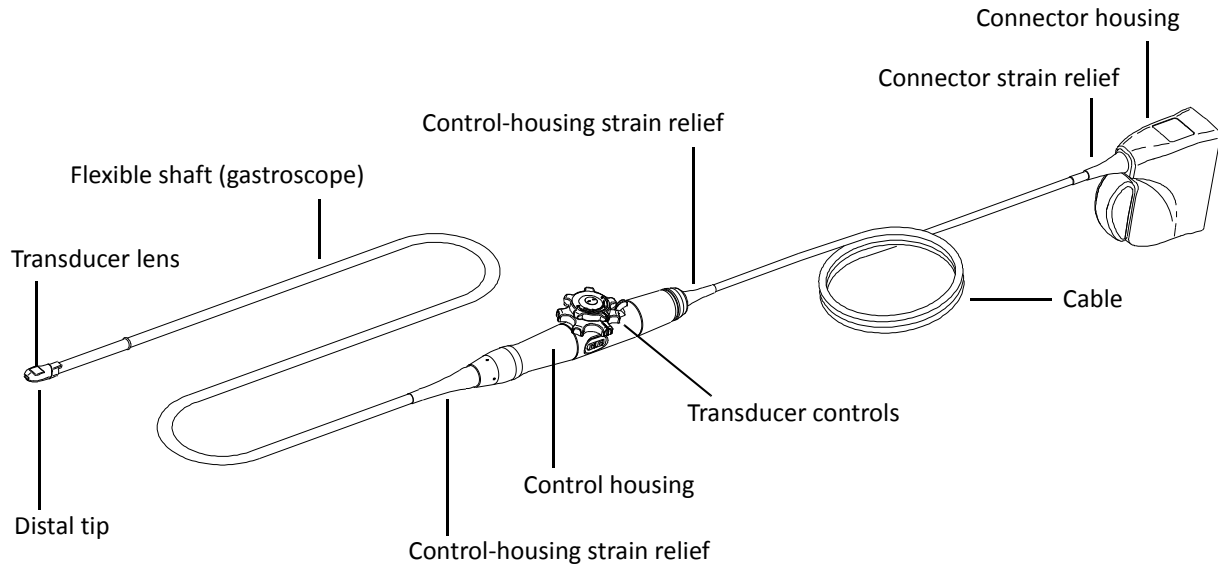
5. Remove the transducer from the sterilization solution after the recommended sterilization time has elapsed.
6. Using the instructions on the sterilization label, rinse the transducer in sterile water up to the point of immersion. Do not immerse the connector, connector strain relief, or cable that is within 5 cm (2 in) of the strain relief.
7. Using an appropriate disinfectant for the cable and connector, wipe or spray the cable, strain relief, and connector, following disinfectant label instructions for wipe durations, solution strengths, and duration of disinfectant contact. Ensure that the solution strength and duration of contact are appropriate for the intended clinical use of the device. Ensure that the disinfectant solution does not enter the device or the connector.
8. Air dry or towel dry with a sterile cloth according to the instructions on the sterilization solution label.
9. Examine the transducer for damage, such as cracks, splitting, fluid leaks, or sharp edges or projections. If damage is evident, discontinue use of the transducer, and contact your Philips representative.

Cleaning, Disinfecting, and Sterilizing TEE Transducers

The following topics explain how to clean, disinfect, and sterilize TEE transducers. To determine the appropriate care method for your transducer, see [“Choosing the Correct Transducer Care Method” on page 6](#).

Upon receiving your new transducer, disinfect it before performing the first study. Clean and disinfect the transducer immediately after each use to protect patients and personnel from pathogens. Establish and clearly post a cleaning procedure that includes the following steps.

For non-TEE transducer care instructions, see [“Cleaning, Disinfecting, and Sterilizing Non-TEE Transducers” on page 15](#). The following figure identifies the components of a TEE Transducer.



TEE Transducer Components

Warnings and Cautions for TEE Transducer Care

NOTE

All imaging transducers are rated at a minimum IPX7 in accordance with IEC 60529, “Degrees of Protection Provided by Enclosures (IP code).” This rating indicates that the device is protected against the effects of immersion. Continuous wave (non-imaging) transducers are rated IPX1. This rating indicates that the device is protected against the effects of vertically falling water. For all TEE transducers, the control module is rated IPX1, while the endoscope is rated IPX7, in accordance with IEC 60529.

Cautions for TEE Transducer Disinfection and Sterilization

Obey the following safety precautions when disinfecting TEE transducers:



CAUTIONS

- **Never sterilize the transducer with autoclave, gamma-radiation, gas, steam, or heat sterilization techniques. Severe damage will result. Avoidable transducer damage is not covered by the warranty or service contract.**
- **Do not bend the flexible shaft into a circle with a diameter of less than 0.30 m (1 ft).**
- **Do not use bleach on the transducer and flexible shaft.**
- **Do not use isopropyl alcohol-based products on any part of a TEE transducer except the connector housing and the handle.**
- **Do not soak the transducer for extended periods of time. Limit the time that transducers are soaked in disinfectant solution to the minimum time recommended by the disinfectant manufacturer.**
- **Do not rinse or immerse the handle, cable, connector, or the portion of the cable near the connector.**
- **Do not immerse or rinse the steering mechanism and handle.**
- **Follow the recommendations of the disinfectant manufacturer.**
- **The transducer steering mechanism is unsealed. If disinfectant or other fluid enters the steering mechanism, it corrodes the gears and electrical connections. Avoidable transducer damage is not covered by the warranty or service contract.**

Minimizing the Effects of Residual Disinfectant

If you use an OPA-based disinfectant, residual solution may remain on your transducers if you do not carefully follow the manufacturer's instructions.



WARNING

Residual OPA on TEE transducers may cause temporary staining of the mouth and lip area and irritation or chemical burns of the mouth, throat, esophagus, and stomach.

To minimize the effects from residual OPA, or any other disinfectant, Philips recommends the following:

- Follow the disinfectant manufacturer's instructions very carefully. For example, the manufacturer of Cidex OPA recommends soaking transducers three times in fresh water.

- Use a protective transducer cover during endocavity and TEE studies.
- Use a sterile protective transducer cover with sterile ultrasound transmission gel during intraoperative and biopsy studies.
- Limit the time that transducers are soaked in the disinfectant solution to the minimum time recommended by the disinfectant manufacturer (for example, the manufacturer of Cidex OPA recommends a minimum of 12 minutes).

High-Level Disinfection of TEE Transducers

High-level disinfection by immersion is the accepted method of infection control for transesophageal transducers. Philips recommends that a protective transducer cover be used during studies.

This procedure covers cleaning and disinfecting the various parts of the transducer. Different solutions may be used on different parts. For a list of compatible disinfectants, see the Web site for your Philips Ultrasound system.

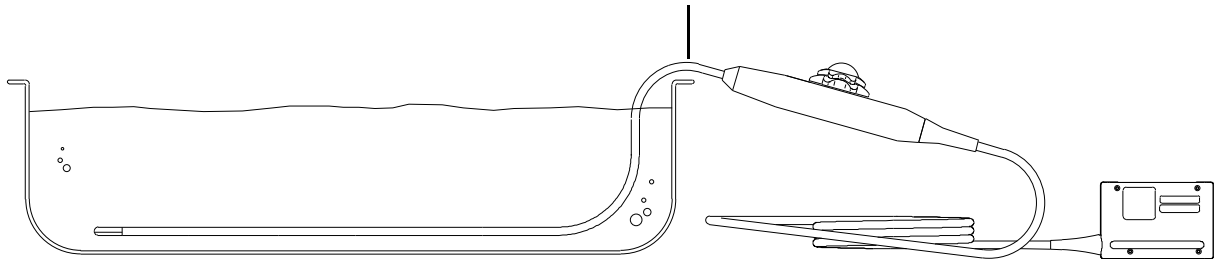
Before performing this procedure, read [“Warnings and Cautions” on page 7](#), [“Transducer Care and Operator Safety” on page 10](#), and [“Warnings and Cautions for TEE Transducer Care” on page 26](#).

Cleaning and Disinfecting TEE Transducers

1. Disconnect the transducer from the system, and remove any accessories attached to or covering the transducer.
2. Clean the transducer distal tip and flexible shaft using any of the following: enzymatic cleaner, mild soap solution, or an approved wipe. Follow the manufacturer's instructions for use. Do not use iodine-based soaps.
3. Use water to gently rinse the distal tip and flexible shaft thoroughly. Do not rinse or immerse the handle, steering mechanism, cable, or connector.
4. Choose a high-level disinfection solution compatible with your transducer. Follow the label instructions for preparation and solution strength. If a pre-mixed solution is used, be sure to observe the solution expiration date. For information on the disinfectants that are compatible with TEE transducers, see the Philips Ultrasound Transducer Care website (www.healthcare.philips.com/us/products/ultrasound/transducers/transducer_care/).

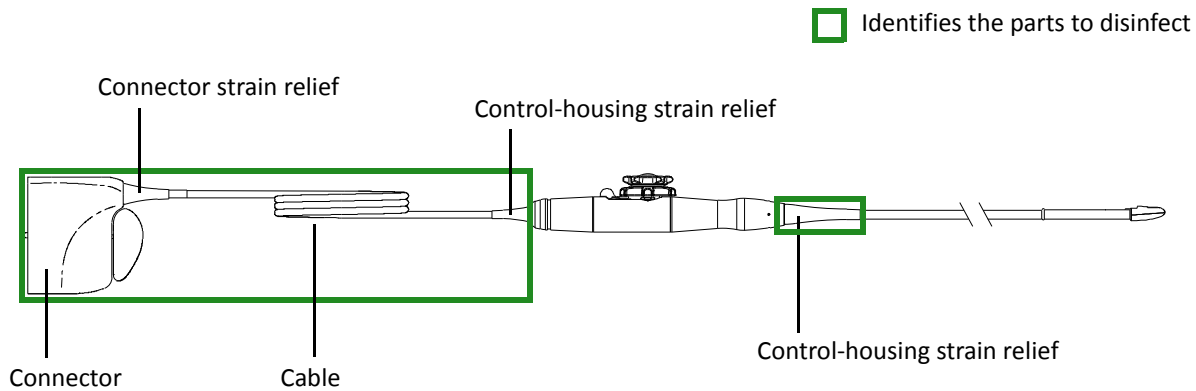
5. Disinfect the distal tip and flexible shaft by placing them into the appropriate disinfectant as shown in the illustration. Follow instructions on the disinfectant label for the duration of transducer immersion. Do not immerse transducers longer than the minimum time needed for your level of disinfection

Do not immerse beyond this point, 5 cm (2 in) from the strain relief



Immersing the Distal Tip and Flexible Shaft of TEE Transducers

6. Remove the distal tip and flexible shaft from the disinfectant and thoroughly rinse with water according to the instructions from the disinfectant manufacturer.
7. Check the transducer for any residual organic material. If any is present, remove it and disinfect the transducer again.
8. Gently dry the distal tip and flexible shaft with a sterile cloth or pad, or allow it to air dry.
9. Lightly wipe only the steering mechanism and handle with a pad moistened with rubbing alcohol (70% isopropyl alcohol), or use approved cleaners as directed on the handle and steering mechanism.
10. Use a soft cloth lightly dampened in a mild soap or detergent solution to clean the cable, the strain reliefs, and the connector. A soft-bristled brush can be used only the metal surfaces of the connector.
11. Choose the disinfection solution compatible with your cable and connector. Follow the label instructions for preparation and solution strength. If a pre-mixed solution is used, be sure to observe the solution expiration date. For information on the disinfectants that are compatible with TEE transducers, see the Philips Ultrasound Transducer Care website (www.healthcare.philips.com/us/products/ultrasound/transducers/transducer_care/).
12. Wipe or spray the cable, strain relief, and connector with the disinfectant, following disinfectant label instructions for wipe durations, solution strengths, and duration of disinfectant contact with the cable. Ensure that the solution strength and duration of contact are appropriate for the intended clinical use of the device. Ensure that the disinfectant solution does not enter the device.



Disinfecting the Cable, Strain Reliefs, and Connector of TEE Transducers

13. Hang the transducer on a wall-mounted rack, and let it air dry.
14. Examine the transducer for damage, such as cracks, splitting, fluid leaks, or sharp edges or projections. If damage is evident, discontinue use of the transducer and contact your Philips representative

Disinfecting TEE Transducers with an AER

Before performing this procedure, read [“Warnings and Cautions” on page 7](#), [“Transducer Care and Operator Safety” on page 10](#), and [“Warnings and Cautions for TEE Transducer Care” on page 26](#).

The automated endoscopy reprocessor (AER) disinfectant can be used only with specific transducers. For information on the transducers that are compatible, see the Philips Ultrasound Transducer Care website (www.healthcare.philips.com/us/products/ultrasound/transducers/transducer_care/).

Methods for disinfecting transesophageal (TEE) and non-TEE transducers differ. For non-TEE transducers, see [“Disinfecting Non-TEE Transducers by Immersion” on page 22](#).

1. Disconnect the transducer from the system.
2. Follow the AER manufacturer’s instructions for disinfection. For TEE transducers, ensure that the AER system isolates the transducer handle, cable and connector from contact with fluids used during the disinfectant cycle. These components are unsealed, resulting in potential damage to the transducer. Avoidable transducer damage is not covered by the warranty or service contract.

Sterilization of TEE Transducers

Sterilization is required if the transducer enters otherwise sterile tissue without a sterile cover. If you use a sterile cover, you should sterilize, but high-level disinfection is acceptable. For information about disinfecting a transducer, see [“High-Level Disinfection of TEE Transducers” on page 28](#).

The main difference between sterilization and disinfection by immersion is the length of time the transducer is immersed. To determine if your transducer requires sterilization or high-level disinfection, see [“Choosing the Correct Transducer Care Method” on page 6](#).

This procedure covers cleaning and disinfecting/sterilizing the various parts of the transducer. Different solutions are used on different parts. For a list of compatible disinfectants, see the Web site for your Philips Ultrasound system.

Before performing this procedure, read [“Warnings and Cautions” on page 7](#), [“Transducer Care and Operator Safety” on page 10](#), and [“Warnings and Cautions for TEE Transducer Care” on page 26](#).



WARNINGS

- **Always use protective eyewear and gloves when cleaning, disinfecting, or sterilizing any equipment.**
- **In intraoperative applications, sterilized transducers should be used with sterile gel and a sterile transducer cover.**
- **Sterile transducer covers are disposable and must not be reused.**
- **If a pre-mixed solution is used, be sure to observe the solution expiration date.**
- **Transducers must be cleaned after each use. Cleaning the transducer is an essential step before effective disinfection or sterilization. Be sure to follow the manufacturer’s instructions when using disinfectants.**

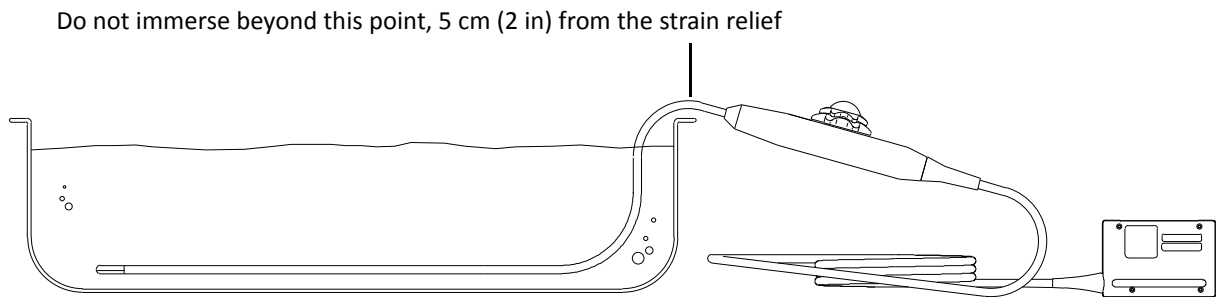


CAUTIONS

- **Use only liquid solutions to sterilize transducers. Using autoclave, gas (EtO), or other methods not approved by Philips will damage your transducer and void your warranty.**
- **Do not allow sharp objects, such as scalpels and cauterizing knives, to touch transducers or cables.**
- **When handling a transducer, do not bump the transducer on hard surfaces.**
- **Ensure that the solution strength and duration of contact are appropriate for sterilization. Be sure to follow the manufacturer's instructions.**

Cleaning and Sterilizing TEE Transducers

1. Disconnect the transducer from the system, and remove any accessories attached to or covering the transducer.
2. Clean the transducer distal tip and flexible shaft using any of the following: enzymatic cleaner, mild soap solution, or an approved wipe. Follow the manufacturer's instructions for use. Do not use iodine-based soaps.
3. Use water to gently rinse the distal tip and flexible shaft thoroughly. Do not rinse or immerse the handle, steering mechanism, cable, or connector.
4. Choose a sterilization solution compatible with your transducer. Follow the label instructions for preparation and solution strength. If a pre-mixed solution is used, be sure to observe the solution expiration date. For information on the disinfectants that are compatible with TEE transducers, see the Philips Ultrasound Transducer Care website (www.healthcare.philips.com/us/products/ultrasound/transducers/transducer_care/).
5. Disinfect the distal tip and flexible shaft by placing them into the appropriate sterilization solution as shown in the illustration. Follow the instructions on the solution label for the duration of transducer immersion. Do not immerse transducers longer than the minimum time needed for your level of sterilization.



Immersing the Distal Tip and Flexible Shaft of TEE Transducers

6. Remove the distal tip and flexible shaft from the sterilization solution and thoroughly rinse with water according to the instructions from the solution manufacturer.
7. Check the transducer for any residual organic material. If any is present, remove it and sterilize the transducer again.
8. Gently dry the distal tip and flexible shaft with a sterile cloth or pad, or allow it to air dry.
9. Lightly wipe only the steering mechanism and handle with a pad moistened with rubbing alcohol (70% isopropyl alcohol), or use approved cleaners as directed on the handle and steering mechanism.
10. Use a soft cloth lightly dampened in a mild soap or detergent solution to clean the cable, the strain reliefs, and the connector. A soft-bristled brush can be used to clean only the metal surfaces of the connector.
11. Choose the disinfection solution compatible with your cable and connector. For a list of compatible disinfectants, see the Web site for your Philips Ultrasound system. Follow the label instructions for preparation and solution strength. If a pre-mixed solution is used, be sure to observe the solution expiration date.
12. Wipe or spray the cable, strain relief, and connector with the disinfectant, following disinfectant label instructions for wipe durations, solution strengths, and duration of disinfectant contact with the cable. Ensure that the solution strength and duration of contact are appropriate for the intended clinical use of the device. Ensure that the disinfectant solution does not enter the device or the connector.
13. Hang the transducer on a wall-mounted rack, and let it air dry.
14. Examine the transducer for damage, such as cracks, splitting, fluid leaks, or sharp edges or projections. If damage is evident, discontinue use of the transducer and contact your Philips representative.

Disinfectants

Read this information before performing disinfection and sterilization procedures. It discusses recommended disinfectants and choosing an appropriate disinfectant for the required level of disinfection. You must refer to [“Choosing Disinfectants and Cleaning Solutions” on page 35](#) for the chemical compatibility of disinfectants and cleaners with specific transducers. Additionally, the tables indicate if a device can be sprayed or wiped only, or if it can be soaked.

About Disinfectants



WARNINGS

- **Not all disinfectants are effective against all types of contamination. Ensure that the disinfectant type is appropriate for the type of transducer and that the solution strength and time of contact are appropriate for the intended clinical use.**
- **Disinfectants listed in this section are recommended because of their chemical compatibility with product materials, not their biological effectiveness. For the biological effectiveness of a disinfectant, see the guidelines and recommendations of the disinfectant manufacturer, the Association for Professionals in Infection Control, the U.S. Food and Drug Administration, and the U.S. Centers for Disease Control.**
- **If a pre-mixed solution is used, be sure to observe the solution expiration date.**
- **Always use protective eyewear and gloves when cleaning and disinfecting any equipment.**
- **The level of disinfection required for a device is dictated by the type of tissue it will contact during use. Ensure that the disinfectant type is appropriate for the type of transducer and the transducer application. For information on the levels of disinfection requirements, see [“Choosing the Correct Transducer Care Method” on page 6](#). For more information, see the disinfectant label instructions and the recommendations of the Association for Professionals in Infection Control, the U.S. Food and Drug Administration, and the U.S. Centers for Disease Control.**



CAUTIONS

- Using a non-recommended disinfection solution, using incorrect solution strength, or immersing a transducer deeper or longer than recommended can damage the device and voids the warranty.
- The use of 70% isopropyl alcohol (rubbing alcohol) and alcohol-based products on all transducers is restricted. On non-TEE transducers, the only parts that may be cleaned with isopropyl alcohol are the connector housing and the transducer housing and lens. On TEE transducers, the only parts that may be cleaned with isopropyl alcohol are the connector housing and the handle. Ensure that the solution is only 70% alcohol or less. Do not wipe any other part of a transducer with isopropyl alcohol (including cables or strain reliefs), as it can damage those parts of the transducer. This damage is not covered by the warranty or your service contract.

Factors Affecting Disinfectant Efficiency

The following factors will affect the efficiency of a disinfectant solution:

- Number and location of microorganisms
- Innate resistance of microorganisms
- Concentration and potency of disinfectants
- Physical and chemical factors
- Organic and inorganic matter
- Duration of exposure
- Biofilms

Choosing Disinfectants and Cleaning Solutions

To choose the disinfectant and cleaning solutions for your transducers, see the Philips Ultrasound Transducer Care website (www.healthcare.philips.com/us/products/ultrasound/transducers/transducer_care/) or the *User Manual* for your ultrasound system. The website includes a compatibility table that lists the disinfectants and cleaning solutions that are compatible with the transducers available for your system. The tables are organized by system name and presented in PDF format on the website.

NOTE

TEE transducers require unique methods for disinfection. See “[High-Level Disinfection of TEE Transducers](#)” on page 28 or “[Disinfecting TEE Transducers with an AER](#)” on page 30.

Based on material compatibility testing, product use profile, and active ingredients, Philips has approved for use the following types of low-level disinfectants used as a spray or wipe for surface (skin contact) and transvaginal or transrectal probes, according to the compatibility restrictions in the tables:

- Sodium hypochlorite based (for example 10% household bleach solution with active sodium hypochlorite at approximately 0.6%)
- Quaternary ammonium (QUAT) based (for example, products that contain n-alkyl (x)benzyl ammonium chloride solution where (x) can be any organic functional group such as ethyl and methyl, and so on; concentration at use should be less than 0.5% total for all QUATs listed)
- Accelerated hydrogen peroxide based
- Activated hydrogen peroxide based
- Alcohol or alcohol plus QUAT based (product alcohol content cannot exceed 70%)
- You may also use products not specifically listed in the compatibility tables but with similar active ingredients, as indicated above, and marketed for medical use.

Because of the large number of available cleaning and disinfection products, it is impossible to have an all-inclusive list. If you are unsure of the suitability of a particular product, please contact your Philips representative for assistance.

For more information:

- www.healthcare.philips.com/us/products/ultrasound/transducers/transducer_care/
- In North America, call Philips at 800-722-9377.
- Outside North America, contact your local Philips representative.

Related Care Information

System Maintenance

Maintenance should be performed regularly and as needed. Because the system is a piece of medical equipment that contains several circuit boards, extensive service diagnostics, and complex operating software, Philips recommends that only trained personnel service the system.

Cleaning and Maintaining the System

It is important to clean and maintain the ultrasound system and peripherals. Thorough cleaning is particularly important for pieces of peripheral equipment, because they contain electromechanical devices. If exposed to constant and excessive environmental dust and humidity, these devices will suffer in both performance and reliability.

It is essential to clean the transducers used with your ultrasound system. The cleaning procedures vary for the different types of transducers and their uses. For detailed instructions on how to clean and maintain each type of transducer used with the system, including disinfectant compatibility, see [“Transducer Care Overview” on page 5](#).

System Control Panel Maintenance

The system control panel and other outer surfaces are most likely to be affected by liquid spills and other materials such as excessive amounts of gel. These materials may seep into electrical components under the panel and cause intermittent failures. During preventive maintenance, look for such potential problems including loose knobs and worn controls.

Cleaning the System and ECG Equipment

Use this method to clean the system and the electrocardiogram (ECG) cables, leads, and electrodes. You can use a mild soap solution on most surfaces. If the equipment has come in contact with blood or infectious material, you can clean most surfaces with a 70% solution of isopropyl alcohol. For instructions on disinfecting system surfaces, see [“Disinfectants for System Surfaces \(Except Display Screens\)” on page 39](#).

**WARNING**

Always use protective eyewear and gloves when cleaning and disinfecting any equipment.

**CAUTIONS**

- **Orient the parts that must remain dry higher than the wet parts until all parts are dry.**
- **When cleaning the system control panel, monitor screen, touch screen, and keyboard, take care not to get any solution inside the housings.**
- **Do not use strong solvents, common cleaning products, or abrasive cleansers, which will damage the system surfaces.**
- **Do not use cleaners containing bleach on the displays. It may damage the surfaces.**
- **Do not touch the displays with sharp objects or use paper towels to clean them, which may damage them.**
- **Take care not to scratch the face of the display while cleaning it.**

Use the following procedure to clean these system parts:

- Display screens, including monitor and touch screens
 - System control panel
 - External surfaces of the system and the cart
 - ECG trunk cables, leads, and electrodes
1. Before cleaning, turn off the system and unplug the power cord from the power source.
 2. To clean display screens:
 - a. Remove dust with a soft, lint-free cloth. A microfiber cloth is recommended.
 - b. Clean the screens with a liquid screen cleaner specifically designed for LCDs: Spray the liquid onto the cleaning cloth or spray sparingly onto the displays. You can also use pre-moistened screen wipes.
 - c. Dry the displays with a soft, lint-free cloth.

3. To clean the control panel, remove any solid matter around keys or controls with a cotton swab or toothpick to ensure that solids are not pushed into the cabinet. Wipe with a soft cloth moistened with soap and water.



CAUTION

Do not spill or spray liquid on the controls, into the system cabinet, or into the transducer receptacles.

4. To clean the remaining external surfaces of the system and the cart, ECG trunk cables, leads, and electrodes, wipe with a soft cloth moistened with soap and water. You may use alcohol for stubborn stains or inks, then wash with soap and water.
5. If the equipment has come in contact with blood or infectious material, you can clean most surfaces with a 70% solution of isopropyl alcohol. For instructions on disinfecting system surfaces, see [“Disinfectants for System Surfaces \(Except Display Screens\)” on page 39.](#)



CAUTION

If blood or other infectious material comes in contact with a transducer or transducer cable, do not wipe with isopropyl alcohol until you have read specific cleaning guidelines. Isopropyl alcohol use is highly restricted on transducers and should never be used on any parts of the transducer cable. Additional cleaning agents are also available for transducers

6. Remove any residue with a cloth moistened with sterile water
7. Dry the equipment to prevent potential corrosion.

Disinfectants for System Surfaces (Except Display Screens)

The exterior surfaces of the system can be disinfected using a compatible disinfectant with a wipe method. System surfaces include monitor screens, the touch screens, and plastic and painted surfaces.

The following products can be used on all system surfaces *except* monitor screens and touch screens:

- Mild soap solution
- 70% isopropyl alcohol (IPA)
- T-Spray II (quaternary ammonium-based)

- Opti-Cide 3 (quaternary ammonium/isopropyl alcohol-based)
- Sani-Cloth HB (quaternary ammonium-based)
- Sani-Cloth Plus (quaternary ammonium/isopropyl alcohol-based)
- 0.5% Accelerated hydrogen peroxide
- Other low- and intermediate-level disinfectants marketed for use on medical instruments and based on quaternary ammonium compounds (QUAT), accelerated hydrogen peroxide (AHP), or sodium hypochlorite (NaOCl), equal to or less than 0.6%, are approved for use in disinfecting system surfaces.

**CAUTION**

Do not use acetone, MEK, paint thinner, or other strong solvents to clean plastics.

The following products can be used on monitor screens and touch screens:

- Cleaners designed for LCDs
- Deionized water

Disinfectants may be used when necessary but are not recommended for routine cleaning. Do not use glass cleaners or products containing alcohol. Use microfiber cloth; do not use paper towels.

Surfaces are resistant to ultrasound gel, alcohol, and disinfectants, but if used, must be wiped off immediately to prevent permanent damage.

Disinfecting System Surfaces

Before performing this procedure, read [“Disinfectants for System Surfaces \(Except Display Screens\)” on page 39](#). Because the system is a piece of medical equipment that contains several circuit boards, extensive service diagnostics, and complex operating software, Philips recommends that only trained personnel service the system.

**WARNING**

Always use protective eyewear and gloves when cleaning and disinfecting any equipment.



CAUTIONS

- **Use only compatible disinfectants on system surfaces.**
 - **Do not spray disinfectant directly on system surfaces. When wiping, do not allow disinfectant to pool or run on system surfaces. In either case, disinfectant may leak into the system, damaging the system and voiding the warranty. Wipe only with a cloth or applicator that is lightly dampened.**
 - **If you use an isopropyl alcohol solution for disinfection, ensure that the solution is only 70% alcohol or less. Solutions of more than 70% alcohol can cause product damage.**
1. Turn off the system and disconnect the system power cord from the wall outlet.
 2. Clean the system according to the procedures in [“Cleaning the System and ECG Equipment” on page 37](#).
 3. Choose the disinfection solution compatible with your system and follow the label instructions for preparation and solution strength. If a pre-mixed solution is used, be sure to observe the solution expiration date.
 4. Wipe system surfaces with the disinfectant, following disinfectant label instructions for wipe durations, solution strengths, and disinfectant contact duration. Ensure that the solution strength and duration of contact are appropriate for the intended clinical application.
 5. Air dry or towel dry with a sterile cloth according to the instructions on the disinfectant label.

Regularly clean the outside of the system as described in [“Cleaning the System and ECG Equipment” on page 37](#).

Cleaning the Trackball

Cleaning the trackball regularly prolongs its useful life and prevents service calls.

1. Remove the ring around the trackball using the appropriate procedure for your system.
2. Lift the trackball out of the mounting area.
3. Clean the trackball and the mounting area with a lint-free cloth or a small brush.
4. Place the ball back on the mounting area.
5. With your fingers, screw the ring back on.

Cleaning the System Air Filter



WARNING

Before performing maintenance or cleaning, always turn off the system, and then disconnect the system from the wall outlet.



CAUTIONS

- **Turn off power before you remove the air filter. Do not turn on power without the air filter installed.**
- **Ensure that air filter is dry before installing it. Installing a wet or damp air filter can damage the system.**

The system air filters should be inspected every week and cleaned as needed. If you decide to clean the air filters with soap and water, you may want to install a spare filter while the other filter is drying. Additional air filters can be ordered from Philips.

For the location of the air filter, see your system *User Manual*.

1. Locate the air filter handle.
2. Pull the air filter handle straight out, until the filter is completely removed from the system
3. Inspect the filter. Depending on the condition of the air filter, vacuum or rinse the filter with water to clean it. If the filter is worn out, or cannot be cleaned, replace it with a spare.
4. To reinstall the filter, slide the filter into place.

NOTE

Some systems have a setting for setting the air filter maintenance status. For instructions, see your system *User Manual*.

Ultrasound Transmission Gels

For proper transmission of the acoustic beam, use the ultrasound transmission gel supplied by or recommended by Philips, or another glycol-, glycerol-, or water-based acoustic coupling medium. Products that do not contain mineral oil are acceptable for use. Never use lotion-based products.



WARNING

For intraoperative applications, use only the Sterile Aquasonic or Sterile Ultraphonic gel provided with the transducer cover.



CAUTIONS

- **Do not apply gel to the transducer until you are ready to perform the procedure. Transducers should not be left soaking in gel.**
- **Do not use gels that contain mineral oil or lotion. Such products may damage the transducer and void the warranty.**

Gels listed here are recommended because of their chemical compatibility with product materials. Some recommended gels include:

- Aquasonic 100
- Aquasonic Clear
- Carbogel-ULT
- ECG Gel (Nicom)
- Nemidon Gel
- Scan

For additional compatibility information, call Philips at 800-722-9377 (North America) or your local Philips representative (outside North America).

Transducer Storage and Transport

Use the appropriate guidelines for storing transducers for transport, and daily and long-term storage.

Storage for Transport

If a carrying case is provided with your transducer, always use the carrying case to transport the transducer from one site to another. Follow these guidelines to properly store transducers for transport:

- Make sure that the transducer is clean and disinfected before placing it in the case, to avoid contaminating the foam that lines the carrying case.
- Place the transducer in the case carefully to prevent kinking of the cable.
- Before closing the lid, make sure that no part of the transducer is protruding from the case.
- Wrap the case in plastic material containing air pockets (such as Bubble Wrap material), and pack the wrapped case in a cardboard carton.
- To avoid damaging the shaft or steering mechanism of TEE transducers, do not bend or coil the flexible shaft of the transducer in less than a 0.30-m (1-ft) diameter circle.

Daily and Long-Term Storage

Follow these guidelines to protect your transducer:

- Always store transducers in the transducer holders on the side of your system or on a securely mounted wall rack when you are not using them.
- Ensure that the transducer holders are clean before storing transducers (see [“Disinfecting System Surfaces” on page 40](#)).
- Avoid storing transducers in areas of temperature extremes or in direct sunlight.
- Store transducers separately from other instruments, to avoid inadvertent transducer damage.
- When storing transducers, use the cable-management clips to secure the transducer cable.
- Before storing transducers, make sure they are thoroughly dry.
- For TEE transducers, be sure the distal tip is straight and protected before storing the transducer.
- Never store a TEE transducer in the carrying case, except to transport it.

Supplies, Accessories, and Customer Service

Supplies and Accessories

To order ECG trunk cables, lead sets, and electrodes; transducer covers; bite guards; biopsy guides; and other supplies and accessories, contact CIVCO Medical Solutions:

CIVCO Medical Solutions

102 First Street South, Kalona, IA 52247-9589

Telephone: 800-445-6741 (USA and Canada), +1 319-248-6757 (International)

Fax: 877-329-2482 (USA and Canada), +1 319-248-6660 (International)

E-mail: info@civco.com

Internet: www.civco.com

Customer Service

Customer service representatives are available worldwide to answer questions and to provide maintenance and service. Please contact your local Philips representative for assistance. You can also contact the following office for referral to a customer service representative, or visit the Philips Healthcare “Contact Us” website:

www.healthcare.philips.com/main/about/officelocator/index.wpd

Philips Ultrasound, Inc.

22100 Bothell-Everett Highway, Bothell, WA 98021-8431, USA

800-722-9377

