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Health & Safety

Use requirements

An interpupillary distance (an eye measurement of the distance between your two pupils) between 51 and 74 is needed to correctly and comfortably view Holograms with HoloLens. This range accommodates most adults and children age 13 and older. HoloLens is not intended for use by children under the age of 13. Good binocular vision is required to view stereoscopic 3D content. HoloLens can be worn over most glasses and used with contact lenses. If you have a binocular vision disorder, such as strabismus (eye misalignment, crossed or wandering eye), you may not be able to view 3D images comfortably. A small percentage of people have a pre-existing binocular vision disorder that they might not be aware of until they try viewing 3D images. Consider consulting an eye doctor if you are not able to view the 3D effect clearly and comfortably.

Safety and comfort



This symbol identifies safety and health messages in this Device Guide



WARNING

Failure to properly set up, use and care for HoloLens can increase the risk of serious injury, death, property damage, or damage to the product or related accessories. If you let anyone borrow your HoloLens, make sure that they understand the health and safety information in this guide and complete the Calibration application.



Warning: Use in safe surroundings

Using HoloLens can distract you and make it hard to see your surroundings. Holograms may appear to be at a distance but still block your view of nearby real objects.

Use only in a safe place that is appropriate for your activities. Avoid trip hazards, stairs, low ceilings, fragile or valuable items that could be damaged, etc. Do not use HoloLens when a full field of view and attention are needed for safety, such as while operating a vehicle or doing other potentially hazardous activities.



Caution: Discomfort

You may experience discomfort when using HoloLens. Keep your first few sessions with HoloLens brief, and be sure to take breaks. If you experience discomfort, stop and rest until you feel better. This discomfort might include temporary feelings of nausea, motion sickness, dizziness, disorientation, headache, fatigue, eye strain or dry eyes. See hololens.com/support/comfort for more information.



Caution: Using Mixed Reality Comfortably

Some people may experience discomfort such as nausea, motion sickness, dizziness, disorientation, headache, fatigue, eye strain or dry eyes when using mixed or virtual reality, particularly as they adjust to using it. Typically, motion sickness and related symptoms occur when there is a mismatch between what you see and what your body perceives. If you are prone to motion sickness in other situations, are afraid of heights, get migraine headaches, have an inner ear disorder, or other health conditions, you may be at increased risk of discomfort.

Certain situations can increase your risk of discomfort.

For example:

- Being a new user - symptoms tend to decrease as your vision system adapts.
- Display not calibrated, or headset not oriented correctly on your head. Make sure HoloLens is properly calibrated and that it is properly aligned by using the Calibration application.
- Certain types of content, particularly games or films that make you feel as if you are moving through space or looking down from high, or interactions that involve tracking moving objects.
- Using HoloLens for extended periods without a break.
- Using HoloLens in a completely dark environment that keeps you from seeing visual cues with your peripheral vision.

Consider keeping your first sessions brief. Start slowly and look around to get a feel for how the virtual objects and the outside world interact. For most people discomfort should decrease as you get more practice over your first few sessions.

Take breaks periodically and stop and rest if you experience any discomfort. The timing and length of breaks may depend on the individual user and what you are doing with HoloLens.

If you experience discomfort, stop using HoloLens and rest until you feel better. Sitting still in a well-lit environment can help speed recovery from disorientation. If you feel disoriented, avoid activities that require balance, coordination or other capabilities until you recover. Be sure the display is properly calibrated. Take note of the type of content you were viewing and other aspects of the situation in which the discomfort occurred so you can adjust or ease into the situation next time. People differ in the time they take to adapt. Consider taking more frequent or longer breaks.

If symptoms are severe or persist, consult your doctor. Viewing 3D or Mixed Reality is not known to harm vision development or cause binocular vision disorders. If you are not able to view the 3D effect clearly and comfortably, consider consulting an eye doctor, as you may have an undiagnosed binocular vision disorder.

Warning: Be physically capable of your intended use

Make sure your balance and physical abilities are sufficient for any movements while using HoloLens. Take breaks periodically and stop and rest if you get tired, sore or experience any discomfort.

Warning: Hearing Safety

Set the volume loud enough to hear clearly in quiet surrounding and no louder.

- Do not increase the volume after you start listening. Your ears can adapt over time so that high volume sounds normal, but the high volume may still damage your hearing.
- Do not increase the volume to block out outside noise. The combination of outside noise and sound from your headphones can damage your hearing. Sealed or noise-cancelling headphones can reduce outside noise so that you don't have to turn up the volume.
- If you can't understand someone nearby speaking normally, turn down the volume. Sound that drowns out normal speech can damage your hearing. Even with sealed or noise-cancelling headphones, you should be able to hear nearby people speak.

Warning: Minimise your time listening to loud sound

The more time you spend exposed to loud sound, the more likely you are to damage your hearing. The louder the sound, the less time it takes to damage hearing.

- At maximum volume, listening to music on the device with headphones can permanently damage your hearing in 15 minutes.
- Even lower volumes can damage hearing if you are exposed for many hours.
- All of the sound that you are exposed to during a day adds up. If you are exposed to other loud sound, it takes less time listening at high volumes to cause hearing damage.
- To safely use the device with no time limit, keep the volume low enough that you can carry on a conversation with people nearby.

Warning: Be aware of hearing loss symptoms

Stop using this device and have your hearing checked if:

- You experience any hearing loss.
- You hear ringing in your ears.
- Your speech sounds muffled.
- Sound seems dull or flat.

It is a good idea to have your hearing checked regularly by an audiologist.

Warning: Do not attempt repairs

Warning: Do not attempt to take apart, open, service or modify the product, accessories or power supply.

Doing so could present the risk of electric shock or other hazards.

Warning: AC adapter safety

Failure to take the following precautions can result in serious injury or death from electric shock or fire or in damage to the device. To select an appropriate power source for your device:

- Use only the power supply unit and AC power cord that came with your device or that you received from an authorised Microsoft retailer.
- Do not use non-standard power sources, such as generators or inverters, even if the voltage and frequency appear acceptable. Only use the AC power provided by a standard wall outlet.
- Do not overload your wall outlet, extension cord, power strip or other electrical receptacle. Confirm that they are rated to handle the total current (in amps [A]) drawn by the device (indicated on the power supply unit) and any other devices that are on the same circuit.
- On devices where the AC prongs may be folded for storage, before plugging the AC adapter into a power outlet, make sure its prongs are fully extended.

On devices where the AC prongs are removable and where the power supply uses a universal adapter, before plugging the AC adapter into a power outlet, make sure the prong assembly is of the proper configuration for the power outlet and fully seated into the adapter.

Caution: Cable and cord safety

Arrange all cables and cords so that people and pets are not likely to trip over or accidentally pull on them as they move around or walk through the area. Do not allow children to play with cables and cords. Take care not to pull on the power cord when wearing the device.

To avoid damaging the power cords and power supply:

- Protect the power cords from being walked on.
- Protect cords from being pinched or sharply bent, particularly where they connect to the power outlet, the power supply unit and the device.
- Do not jerk, knot, sharply bend or otherwise abuse the power cords.
- Do not expose the power cords to sources of heat.
- Keep children and pets away from the power cords. Do not allow them to bite or chew on them.
- When disconnecting the power cords, pull on the plug—do not pull on the cord.
- If a power cord or power supply becomes damaged in any way, stop using it immediately.
- Unplug your device during lightning storms or when unused for long periods of time.

Warning: Battery safety

This device contains a built-in battery, improper use of which may result in explosion. Do not heat, open, puncture, mutilate or dispose of the product in fire. Do not leave the device in direct sunlight for an extended period of time, which could cause melting or battery damage. The battery in this device is not user replaceable and should only be replaced by Microsoft or a Microsoft Authorised Service Provider. See www.hololens.com/support for additional details.

Warning: Use near water

To reduce the risk of fire or shock, do not use this device near water and do not expose it to rain or moisture. Do not attempt to dry the device with a hair dryer or a microwave oven.

Warning: follow instructions to avoid interference problems

Turn off your HoloLens in any location where posted notices instruct you to do so. In an aircraft, turn off your device whenever instructed to do so by airline staff, or prior to packing a wireless device in luggage.

Warning: Potentially explosive atmospheres

Areas with potentially explosive atmospheres are often, but not always, posted and can include fuelling areas, such as below decks on boats, fuel or chemical transfer or storage facilities, or areas where the air contains chemicals or particles, such as grain dust or metal powders. When you are in such an area, turn off your HoloLens, and do not remove or install battery chargers, AC adapters, or any other accessory. In such areas, sparks can occur and cause an explosion or fire.

Warning: Personal medical devices

Radio-frequency emissions from electronic equipment can negatively affect the operation of other electronic equipment, causing them to malfunction. Although the device is designed, tested and manufactured to comply with regulations governing radio frequency emission in countries such as the United States and Canada, the wireless transmitters and electrical circuits in the device may cause interference in other electronic equipment. Therefore, please take the following precautions: Pacemakers: The Health Industry Manufacturers Association recommends that a minimum separation of 15 cm (6 inches) be maintained between a wireless device and a pacemaker to avoid potential interference with the pacemaker.

Persons with pacemakers:

- Should always keep the device more than 15 cm (6 inches) from the pacemaker when the wireless device is turned on.
- If you have any reason to suspect that interference is taking place, turn the device off immediately.

Caution: Heat related concerns

The device may become very warm during normal use. The device complies with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950-1). To reduce heat related concerns, follow these guidelines:

- Allow for adequate air circulation under and around the device.
- Use caution when operating your device with a pillow, blanket, hat or other soft material contacting the device, because the material can block the airflow which may result in the device overheating.
- If your device gets uncomfortably warm, remove it and take a break.

Warning: Photosensitive seizures

A very small percentage of people may experience a seizure when exposed to certain visual images, including flashing lights or patterns that may appear in video games. Even people who have no history of seizures or epilepsy may have an undiagnosed condition that can cause these “photosensitive epileptic seizures” while watching video games.

These seizures may have a variety of symptoms, including lightheadedness, altered vision, eye or face twitching, jerking or shaking of arms or legs, disorientation, confusion or momentary loss of awareness. Seizures may also cause loss of consciousness or convulsions that can lead to injury from falling down or striking nearby objects.

Immediately stop using and consult a doctor if you experience any of these symptoms. Parents should watch for or ask their children about the above symptoms — children and teenagers are more likely than adults to experience these seizures. The risk of photosensitive epileptic seizures may be reduced by taking the following precautions:

- Using HoloLens in a well-lit room.
- Do not use HoloLens when you are drowsy or fatigued.

If you or any of your relatives have a history of seizures or epilepsy, consult a doctor before using HoloLens.

Warning: Choking hazard

This device may contain small parts which may be a choking hazard to children under 3. Keep small parts away from children.

Caution: Skin irritation

This device is made of materials commonly used in wearable consumer electronic devices. However, certain people may develop skin irritation due to allergies or sensitivities.

To reduce the risk of skin irritation:

- Wipe your device dry with a cloth if it gets wet.

- Avoid using lotions or other products under the portions of HoloLens that contact your head.
- Do not wear over injured skin.
- Adjust the headband only until snug – avoid tightening the headband uncomfortably.

If your skin becomes irritated, stop using HoloLens. If symptoms are severe or persist, **consult your physician**.

Warning: Evaluate eye protection needs for your environment

HoloLens is not intended to provide eye protection against high impacts (Z87.1+), debris, chemicals, UV light, etc. HoloLens has been tested and found to conform to the basic impact protection requirements of ANSI Z87.1, CSA Z94.3 and EN 166.

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