



Robots at your service The future of personal care?

A guide to the British Standard for personal
care robots (BS EN ISO 13482:2014)

Robots are no longer confined to factories and science fiction. New service robots are designed to help people with tasks around the home. As robots come into closer contact with humans, new standards are essential to ensure public safety.

Robots have been used in factories since the 1960s helping to build products such as cars, televisions and computers. But the next generation of personal care robots can fetch objects, perform simple domestic tasks, transport people and even carry out some caring duties. For more details see the box: 'What can personal care robots do?' They have enormous potential to improve the quality of life of older and disabled people by helping them to live more independently.

But this new interaction between robots and people (some of whom might be vulnerable due to age, illness or disability) could lead to serious injury if things go wrong. The standard BS EN ISO 13482 aims to minimize potential risks posed by robots that come into direct contact with people.

Personal care robots: the basics

What is it?

BS EN ISO 13482 is an international standard that provides guidance to manufacturers and suppliers of personal care robots to ensure that they are designed, built and used safely. The standard was developed by a group of industry experts and consumer representatives to make sure that it tackles key issues. It's the first internationally-recognized safety standard to cover the emerging field of personal robotics.

What does it cover?

The standard covers the three main types of personal care robots – mobile servant, physical assistant and person carrier. It includes guidance about risk assessment, safe design, protective measures and information for use.

The standard does not cover robotic toys, medical or industrial robots or ethical issues. Further standards are planned to cover these topics.

Personal care robots: the details

Manufacturers (and suppliers) that comply with BS EN ISO 13482 should:

Identify potential risks

Carry out a risk assessment to identify potential hazards for each different robot model.

This should include:

- Battery charging and energy storage
- Exposure to water, sand, dust or extreme temperatures
- Mechanical instability, e.g. falling over, collisions
- Navigational errors
- Incorrect robotic autonomous decisions and actions

Issue clear labelling and instructions

Make sure that users understand how to operate the robot safely by:

- Clearly marking all switches and controls
- Giving clear safety warnings, e.g. about maximum weight limits and power supply
- Supplying a detailed user manual
- Printing labels and instructions in the language of the country in which the robot is sold
- Making written information clear and accessible to the widest possible audience – using signs and symbols where relevant

Ensure safe movement

The standard requires that moving robots:

- Are designed to be stable when moving and carrying loads (people or objects)
- Use sensors to control movement within an allowable 'operational space', where it can't harm people or damage objects
- Can stop safely when an obstacle is sensed
- Have maximum speed limits for travel – depending on the task being performed

Reduce chances of 'bad' decisions

Some personal care robots are designed to make decisions about what actions to take in certain situations. The standard sets requirements to reduce the chances of a robot making an incorrect decision, and to minimize the risks of it hurting anyone if it does. For example, a person carrier robot should ensure that a passenger is correctly seated before starting to move, or ensure that it stops in a location where it is safe for the passenger to get off.

What can personal care robots do?**Perform basic household tasks:**

- ✓ Open curtains, doors or windows
- ✓ Clean or vacuum
- ✓ Fetch and carry items such as drinks or plates of food
- ✓ Pick up objects from the floor
- ✓ Switch equipment on or off

Give personal assistance:

- ✓ Getting up from a chair or out of bed
- ✓ Getting into and out of a bath or shower
- ✓ Help with getting dressed
- ✓ Help with basic personal care such as combing hair

Transport people:

- ✓ Within their home
- ✓ Around public buildings or other public spaces
- ✓ Between predefined locations

Image courtesy of CYBERDYNE Inc.



Frequently asked questions

Q. What is BSI?

A. BSI is the UK National Standards Body which has been developing standards for more than 100 years to make products and services safer and better for consumers. Standards set out good practice and guidelines for organizations to follow. BSI is the UK member of ISO, the International Organization for Standardization.

Q. Do all organizations have to comply with the standard?

A. No, the standard is voluntary, so you can feel confident that those that choose to comply with this or any other British Standard take safety, customer service and, in this case, social responsibility, seriously.

Q. How do I know if an organization is signed up to the standard?

A. Organizations using the standard will display conformity on the product, but are also likely to communicate this to the public in product brochures, user manuals, advertisements or on company websites. If you're not sure, contact them directly to make enquiries.

Q. If an organization doesn't follow the standard is it breaking the law?

A. No, it's not a legal requirement to follow the standard. However, if an organization claims to comply with the standard, then doesn't, it is a misrepresentation and can be reported to Trading Standards. Even if it does not claim compliance, in the event of a serious complaint or incident, the standard could be used in a court of law to provide a benchmark of best practice.

Q. Where can I get a copy of BS EN ISO 13482?

A. Many libraries and universities can access reference copies of British Standards for you, or copies can be bought from BSI at bsigroup.com/shop.

Useful information

BSI

For information about standards
0845 086 9001

bsigroup.com

For information about consumer-focused standards
bsigroup.com/consumers

International Federation of Robotics (IFR)

For more information about the robotics industry
ifr.org

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