

FIRA Standard

FIRA/REMAN001: 2019 - Remanufacturing

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1.0 INTRODUCTION

Global economic development predicated on unsustainable resource consumption and material inefficiency cannot continue unabated, with global population estimated to rise to around 8 billion by 2025¹ and over 9 billion by 2040.

Population growth accompanied by increased demand for products and services will increase pressure on land, water, energy and finite raw materials. In turn this will lead to increased price volatility and supply chain risks.²

Geopolitical factors such as trade barriers and competition for resources, especially rare earth elements, are already limited in supply and subject to price volatility.

The Circular Economy has emerged as an alternative economic model, offering improved business resilience and sustainable growth, reducing the risks business face with continued reliance on the extraction and supply of raw materials.

In contrast to the prevailing linear economic model, the Circular Economy model advocates that materials currently designated as waste become the raw materials of the future. Opportunities exist to promote the reuse of these raw materials and the embodied energy in their extraction and processing, by keeping them in productive use for as long as possible.

Sustainable procurement is increasingly important, with the release of *ISO 20400:2017 Sustainable Procurement: Guidance* offering organisations guidance on how to embed sustainable procurement decision making within their business. Adoption of the ISO standard will naturally start to promote remanufactured products, which have significantly lower environmental footprints³ than new products, as a realistic alternative to automatically purchasing new products.

In response, the Furniture Industry Research Association undertook a programme of work to support Circular Economy activities and research. This programme included researching potential extended producer responsibility (EPR) schemes for furniture and the development of a remanufacturing standard for furniture products to help promote the reuse of valuable raw materials.

Remanufacturing involves returning a previously used product to a function and form equivalent to that of a new product. In some cases, remanufacturing can upgrade a product to condition beyond its original state, by introducing new components that correct or improve the original product design, provide additional functionality or aesthetic enhancements.

Remanufacturing of products through the isolation of valuable used product cores, the addition of new materials as required, and subsequent reconstruction of the product is increasingly popular, with a number of organisations commercially remanufacturing furniture products.

However, challenges exist for businesses wishing to sell remanufactured products. Customer perception can be that remanufactured goods are of lesser quality than a newly manufactured product or simply express a resistance to being provided with a product that is not new.

A standard is an agreed, repeatable way of doing something affording many benefits. A standard can help in providing a choice for procurers when specifying products and removes the need to be an

¹ Worldometers World Population Statistics <http://www.worldometers.info/world-population/>

² FIRA Sustainability Hotspot Report 2017 <https://www.fira.co.uk/technical-information/reports-and-guides/sustainability-hotspot-analysis-for-the-furniture-industry-1>

³ FIRA 2016 'Remanufacturing for the Circular Economy' <https://www.fira.co.uk/technical-information/sustainability/circular-economy/remanufacturing-for-the-circular-economy>

expert in a particular product or technical field. It can also help to legitimise a particular industry by identifying genuine operators who demonstrate they have met a recognised industry standard.

Whilst remanufacturing affords huge opportunities for businesses to reduce their environmental footprints via procurement, FIRA recognises that not all products placed on the market lend themselves to remanufacturing due to constraints with the original product design or the availability of replacement parts.

The aim of the FIRA Remanufacturing Standard is to support the Circular Economy, ensuring that the maximum value possible is realised from the material and energy invested in the products we use in the workplace.

The FIRA Remanufacturing Standard also aims to give confidence to specifiers, procurement teams and end users that 'second life' furniture does not mean second best. The development of a FIRA product remanufacturing standard will hopefully support existing companies that have embraced remanufacturing, encourage new companies into remanufacturing and ensure that companies procuring remanufactured goods do so from trusted suppliers.

The standard has been produced with a view to allow third party verification of the remanufacturer's product claims regarding the product and its environmental credentials.

Most importantly, the Remanufacturing standard will help to promote end of life considerations in new furniture designs, on the assumption that customers will expect their furniture to be taken through a remanufacturing process.

2.0 SCOPE

The FIRA Remanufacturing Standard specifies requirements for the remanufacture of the following products:

- Office and contract chairs / seating
- Office and contract tables / desking
- Office and contract storage units

The FIRA Remanufacturing Standard provides requirements for an independently verified certification for products that are sold to non-domestic (contract) customers only.

In the FIRA Remanufactured Standard, products are defined as those which have been returned to at least the original product performance, with a warranty that is equivalent or better than that of a newly manufactured product.

This standard does not include reuse or refurbishment. Reuse as a product category can be further divided into three subsets which includes conventional reuse, creative reuse and repurposing.

This document contains 1 Annex:

- Annex A (informative) List of current product standards

3.0 NORMATIVE REFERENCES

The following referenced document was indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 8001:2017 Framework for implementing the principles of the circular economy in organizations.

BS EN ISO 9001:2015 Quality management systems. Requirements.

BS EN ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories

4.0 DEFINITIONS

For the purposes of this FIRA Standard, the definitions given in BS 8001: 2017 and the following apply:

4.1 assemble

To bring components together and fit them into a specified configuration.

4.2 bill of materials

A record of the component parts and materials used to make the product.

4.3 circular economy

The systemic approach to the design of business models, which enables the sustainable management of resources through reuse, refurbishment and remanufacture.

4.4 component

A single part of an assembled product.

4.5 core

The component(s) or product retained throughout the remanufacturing process.

4.6 disassembly

The non-destructive taking apart of an assembled product into constituent materials and / or components.

4.7 product

An article manufactured or remanufactured for use, sale or lease.

4.8 reclamation/reclaiming

The collection of products, components or materials with the intention of avoiding waste, with the purpose of reuse or recycling and therefore keeping in productive use.

4.9 recondition

The return of a used product or major component to a satisfactory working condition by rebuilding, repairing or replacing components that are close to failure following an initial inspection.

4.10 recovery

The activity to identify the used products, components or materials which can be reused in a remanufactured product.

NOTE: Waste used principally as a fuel is considered to be recovery.

4.11 recycle/recycling

Action of processing a used product, component or material for use in a future product, component or material.

NOTE: Recycling involves actions which change the physical and or chemical state of an item. It includes the processing of organic material (e.g. composting cellulose materials) but excludes items used for energy recovery, as fuels, or for backfilling purposes (i.e. where waste is suitable to be applied in a process of landscape engineering).

4.12 recyclable

Any product, component or material which can be processed for recycling.

4.13 refurbish

An aesthetic improvement of a worn product, component or material, which might involve making it look like new, with limited functionality improvements.

4.14 remanufacture

The process of returning a used product to at least its original performance with a warranty to match.

NOTE 1: From a customer viewpoint, the remanufactured product can be considered to be the same as the new product.

NOTE 2: Remanufacturing promotes waste reduction, decreasing the demand on the world's natural resources, saves CO2 emissions in manufacturing and cuts costs for businesses.

NOTE 3: With respect to remanufacture: manufacturing effort involves dismantling the product, the restoration and replacement of components and testing of the individual parts and whole product to ensure that it is within the remanufactured design specifications.

4.15 repair

The returning of a faulty or broken product, component, or material back to a usable state.

NOTE: A repair may use remanufactured or reconditioned parts.

4.16 repurpose

Using an existing product, its components or materials in a role that they were not originally designed to perform.

NOTE: Modification of the product may be required to fulfil its new role.

4.17 reuse

The action of using a product again, whether for its original purpose, conventional reuse or to fulfil a different function creative reuse or repurposing.

NOTE 1: Conventional reuse would typically be using a product in its original form.

NOTE 2: Creative reuse would typically involve a modification of the product's intended use e.g. processing a corner desk into a straight edge desk.

NOTE 3: Repurposing would involve a change of use, for example using the materials from desk to create a storage unit.

4.18 traceability

The ability to follow the history, application, movement and location of an object through specified stage(s) of production, processing and distribution.

NOTE: Traceability is generic and non-discriminatory; the company receives trade units, splits, joins or merges trade units into raw material batches, makes production batches based on the raw material batches, and finally splits the production batches into outgoing trade units. At each stage, a split, join or merge can take place, which will be recorded in the traceability system so that all transformations and dependencies are documented.

4.19 traceability system

A manual or electronic system that provides the ability to access any or all information relating to that which is under consideration, throughout its entire life cycle, by means of accessing records.

NOTE: Method of traceability of materials and components relative to final product is deliberately not specified by this standard to enable flexibility appropriate to the business concerned. Any traceability system used should be explained and documented in a robust procedure.

4.20 warranty

A guarantee, issued to the buyer of an article or product by its manufacturer, promising to repair or replace it if necessary within a specified period of time.

NOTE: A warranty or guarantee is usually offered in addition to the consumers statutory rights.

4.21 waste

Any substance or object which the holder discards, intends or is required to discard that has no or negative economic, social or environmental value and which is suitable only for final disposal by landfilling or incineration.

NOTE 1: Many things considered as waste today could rather be called by-products: they are of no use to the system they come from, but could be of significant value to other systems.

NOTE 2: Whether something is considered to be waste needs to be decided on a case-by-case basis and depends on systemic conditions, such as legislation, infrastructure or the wider market.

5.0 REMANUFACTURING PROCESS

5.1 Product Custody

As an integral part of the product custody process the remanufacturer shall wherever possible seek to obtain:

- a) Description and number of the furniture items reclaimed
- b) Who and where the furniture was reclaimed from
- c) The date of purchase of the original furniture item(s)
- d) The service and or maintenance history of the furniture items
- e) The date of manufacture of the furniture items (batch code)
- f) The original product specification
- g) The product test certification (n.b. This is often supplied during the initial tender process and can be accessed from the original equipment manufacturer. Some test houses also provide certificate search facilities for products they have certified to a given standard).

5.2 Product Inspection

A risk based visual inspection of the product shall be conducted against a documented inspection procedure. The inspection procedure shall include:

- a) Documented acceptance criteria to determine whether the product core is of suitable quality for remanufacture to take place.
- b) Disassembly of the core to the appropriate level in order to determine whether its constituent parts and/or materials are suitable for reuse in the remanufactured product.
- c) A documented acceptance criteria to evaluate whether parts are suitable for reuse in the remanufactured product.
- d) The organisation shall obtain or create documentation to ensure and record the appropriate level of disassembly and component replacement for each product and process.

NOTE 1: Appropriate criteria and considerations for the inspection procedures should include; the necessary techniques required to evaluate the quality, condition, economic viability, aesthetic condition of the core and component parts as well as the environmental impact of disposing of product cores that fail to meet the acceptance criteria.

NOTE 2: It may be necessary to clean the core prior to disassembly to assess its quality and suitability for remanufacture. It may also be necessary to clean parts once the core is disassembled, in order to fully inspect the parts and assess their suitability for reuse in the remanufactured product.

NOTE 3: Parts that do not meet the documented acceptance criteria shall be replaced with new parts to ensure conformance with original specifications from both a performance and quality perspective.

5.3 Product Assembly

The organisation shall:

- a) Retain as documented information the assembly process for each remanufactured product to ensure consistent and correct assembly of the product.
- b) Ensure the product is reassembled applying appropriate updates and any components of insufficient quality or performance are replaced with new or like-new parts as per documented technical specifications.
- c) Retain as documented information a functional inspection checklist to verify the product performance is at least equivalent to that of a new product.
- d) Retain as documented information a visual inspection checklist to verify the product's aesthetic quality meets customer expectations.

NOTE: The functional and aesthetic checklists do not have to be separate documents, but could comprise a single post assembly quality checklist.

5.4 Product Testing

The organisation shall seek to obtain or create technical specifications for the remanufactured product in order to validate there is an equivalent or better condition and performance compared to the original product.

5.4.1 Testing

All Testing shall be:

- a) Applicable to the product standard(s) as listed in Annex A.
- b) Preferably conducted by testing facilities accredited to ISO 17025

If the remanufacturer deems that testing is not needed they must reference evidence obtained during the product inspection and product assembly checklists to support this decision. Testing is not mandatory for remanufactured products unless any of the following points apply:

- a) It is requested by the customer
- b) A single customer order exceeds 1,000 units.
- c) A batch of end of life furniture requisition exceeds 1,000 units.

NOTE: Where customers stipulate that third party testing is required it is likely that all or part of the testing costs would be borne by the customer. The standard does not mandate who should bear the costs of testing.

6.0 REPLACEMENT PARTS/COMPONENTS

Wherever possible the remanufacturer shall demonstrate that replacement parts, components and fixings performance meet or exceed the original product specification.

NOTE: This can be achieved either by reference to the original product specification and bill of materials or via reference to the original manufacturer of the component that is replaced.

7.0 WARRANTY

7.1 Warranty period

The remanufacturer shall provide a warranty period of at least 12 months from the date of supply of the remanufactured products. The warranty expiry date shall be clearly communicated to the customer.

NOTE: The minimum period stipulated should not be interpreted as an industry norm, though it is common practice for some retailers to offer a 12 month warranty period. Many manufacturers chose to offer a 5 year warranty period as standard and it is likely to be commercially advantageous to the remanufacturer to offer as long a warranty period as possible to reassure customers their products will perform equally as well as an equivalent new product.

7.2 Warranty register

The remanufacturer shall retain a warranty register or warranty database.

NOTE: The standard does not stipulate how the remanufacturer should retain this information though the remanufacturer must be able to demonstrate traceability to a specific batch of production (possible solutions include barcoding, QR codes or other form of product labelling that can link to a warranty register).

8.0 RESOURCE AND WASTE STREAM MANAGEMENT

8.1 Compliance

The remanufacturer shall ensure that their waste management is compliant with national waste duty of care legislation and any future legislation adopted into national law relating to the EU Circular Economy Directive is also complied with.

8.2 Waste hierarchy

The remanufacturer shall ensure wherever possible, process waste and components not suitable for remanufacture should avoid disposal through landfill or similar.

NOTE: UK Waste duty of care legislation stipulates a legal responsibility to ensure that waste is minimised, and that it is stored, transported and disposed of without harming the environment. The duty of care has no time limit and stipulates that waste must be:

- *segregated, stored and transported appropriately and securely, making sure that waste does not cause any pollution or harm to human health*
- *handled by people or businesses that are authorised to do so*
- *documented via waste transfer notes, including a full and accurate description of the waste, to document all waste transferred, and kept as a record for at least two years.*

9.0 ENVIRONMENTAL PRODUCT INFORMATION

9.1 Mandatory product information

The remanufacturer shall provide material and environmental data for its remanufactured products. The environmental product statement shall include:

- The recycled content
- The recyclable content
- The material types as a percentage of the product.

9.2 Optional product information

The remanufacturer may provide further environmental data for its remanufactured products to show:

- The carbon footprint of the remanufactured product
- The carbon saving of the remanufactured in comparison to a new product
- The water footprint of the remanufactured product
- The water saving of the remanufactured product in comparison to a new product
- VOC emissions
- chemicals used in production.

9.2.1 Verification of optional product information

All environmental optional product information must be:

- Independently verified by a 3rd party
- or
- Developed using 3rd party software.

Environmental product information must state how environmental data has been developed.

NOTE 1: There are many different carbon foot printing tools available. The standard does not mandate which approach an organisation should use.

NOTE 2: FIRA Furniture Footprinter Tool has been developed provide information to support environmental product statements. Alternative tools are available.

10. Product Labelling

Following independent verification that remanufactured products meet the FIRA Remanufacturing Standard the organisation may label such products certifying conformance with this standard.

The remanufactured product should be permanently and legibly marked with the following:

- a) The name of the remanufacturer
- b) A unique identifier for the product
- c) The month and year of remanufacture.

ANNEX A

LIST OF CURRENT PRODUCT STANDARDS

The standards referenced below are correct at time of publication. As British, European and ISO standards are subject to regular periodic review it is recommended that when using this list the dated reference is checked to ensure the most up to date document is used.

A.1 Seating

BS 5459-2:2000+A2:2008 Specification for performance requirements and tests for office furniture. Office pedestal seating for use by persons weighing up to 150kg and for use up to 24 hours a day, including type-approval tests for individual components

This British standard specifies performance requirements and test methods for the structural safety and stability of office pedestal seating when used by persons weighing up to 150 kg, and or when used for up to 24 hours a day.

BS EN 13200-4:2006 Spectator facilities. Seats. Product characteristics

This European standard covers all types of fixed seating that is seating bolted to the floor, including individual or bench seating for all types of sports venues, whether indoor or outdoor, and has a whole host of requirements covering structural performance, dimensional requirements and requirements for the materials used.

BS EN 1022:2018 Furniture. Seating. Determination of stability

This European standard specifies mechanical test methods for determining the stability of all types of seating and contained recommendations on requirements.

BS EN 1335-1: 2000 Office furniture. Office work chair. Dimensions. Determination of dimensions

This European standard specifies limits and basic ergonomic and functional requirements for adjustable and fixed height chairs, desks, tables and worktops for general purposes and machine operators. Also covers drawers and footrests. An appendix gives anthropometric dimensions taken into consideration.

BS EN 1335-2:2018 Office furniture. Office work chair. Safety requirements

This European standard part specifies the mechanical safety requirements for office work chairs. The requirements are based upon use for 8 hours per day by persons weighing up to 110 kg.

BS EN 16139:2013 Furniture. Strength, durability and safety. Requirements for non-domestic seating

This European standard covers requirements for all types of office and non-domestic seating, including care home, hospital, public area, hotel, hospitality, bar, cafe and restaurant furniture for users weighing up to 110kg.

BS EN 581-1:2017 Outdoor furniture. Seating and tables for camping, domestic and contract use. General safety requirements

Specifies general safety requirements for all types of outdoor seating and tables for camping, domestic and contract use.

BS EN 581-2:2015 Outdoor furniture. Seating and tables for camping, domestic and contract use. Mechanical safety requirements and test methods for seating

Specifies specific safety requirements for all types of outdoor seating for camping, domestic and contract use.

BS 8474:2013 Furniture. Chairs with electrically operated support surfaces. Requirements

Specifies requirements and test methods for chairs with support surfaces, the position of which can be adjusted electrically by the seated person and/or a responsible person, including riser chairs, recliner chairs and rise and recline chairs. It specifies chairs suitable for adult users weighing up to 110 kg and up to 160 kg, with a normal body mass distribution.

The standard is applicable to chairs intended for domestic and non-domestic use. This standard specifies only the safety, strength, stability and durability of the chair structure. It does not specify the fire resistance or durability properties of filling materials, upholstery fabrics or foam cushions. Also, it does not specify the electrical safety of the support surface adjustment mechanism.

NOTE: Electrically actuated seating such as rise recliners are required to conform to EC Directive 2006/42/EC (the Machinery Directive)

BS EN 12727:2016 Furniture. Ranked seating. Requirements for safety, strength and durability

This European Standard specifies requirements determining the safety, structural strength and durability of all types of seating that are permanently fastened to the floor and/or wall, whether in bench or individual seat form. This standard does not apply to linked seating not fastened to the floor and/or walls and street furniture. It does not include requirements for resistance to ageing, degradation, flammability, the effect of ambient temperature and the durability of upholstery materials.

A.2 Desks and tables

BS EN 527-1:2011 Office furniture. Work tables and desks. Dimensions

The revised standard means that any desks bought or designed for an office environment will now have to comply with a new set of height, depth and legroom dimensions. The revision requires larger legroom and greater ranges of adjustability. The standard provides dimensional requirements for four types of desk/tables; those which are fully adjustable; height selectable; fixed height, as well as a type where only very limited adjustability is provided.

BS EN 527-2:2016+A1:2019 Office furniture. Work tables. Safety, strength and durability requirements

This European Standard specifies safety, strength and durability requirements for work tables and desks for office tasks to be undertaken in a seated, a sit-stand or standing position. It does not apply to other tables in the office area, which are covered by EN 15372 (see below) Annex A (informative) contains a test for the deflection of tables tops. Annex B (informative) contains an example of calculation of the stiffness of the structure.

BS EN 581-1:2017 Outdoor furniture. Seating and tables for camping, domestic and contract use. General safety requirements

Specifies general safety requirements for all types of outdoor seating and tables for camping, domestic and contract use

BS EN 581-3:2017 Outdoor furniture. Seating and tables for camping, domestic and contract use. Mechanical safety requirements for tables

Specifies specific safety requirements for all types of outdoor tables for camping, domestic and contract use

BS EN 15372:2016 Furniture. Strength, durability and safety. Requirements for non-domestic tables

This European Standard specifies requirements for the safety, strength and durability of all types of non-domestic tables including those with glass in their construction. It does not apply to office work tables or desks, tables for educational institutions and outdoor tables for which EN standards exist. With exception of the stability tests, this standard does not provide assessment of the suitability of any storage features included in non-domestic tables.

A.3 Storage

PD CEN/TR 14073-1:2004 Office furniture. Storage furniture. Dimensions

This European standard provides the dimensions for storage units in use offices.

BS EN 14073-2:2004 Office furniture. Storage furniture. Safety requirements

This European standard provides the safety requirements for storage units in use in offices.

BS EN 14073-3:2004 Office furniture. Storage furniture. Test methods for the determination of stability and strength of the structure

This European standard provides the test methods for the determination of stability and strength of the structure for storage units in use in offices.

BS EN 14074:2004 Office furniture. Tables and desks and storage furniture. Test methods for the determination of strength and durability of moving parts

This European standard provides the strength and stability test methods for all types of office storage furniture which has moving parts.

BS EN 16121:2013+A1:2017 Non-domestic storage furniture. Requirements for safety, strength, durability and stability

This European standard provides the requirements for the safety, strength, durability and stability for non-domestic furniture, excluding office storage units.

BS EN 16122:2012 Domestic and non-domestic storage furniture. Test methods for the determination of strength, durability and stability

This European standard provides the test methods for the determination of safety, strength and durability of domestic and non-domestic furniture, excluding office storage units.



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