

MARCO

BUSINESS SCAN SGA 2023

(analysis for implementing the principles of the Circular Economy)

1. General description of the activity

company name **Marco sp. z o. o. Gliwice**

type of activity: foils, tapes, seals, labels,

industry of activity: automotive

core business: 3D printing and scanning, geometry measurements, measurements of breaking forces, material strength, environmental tests, e.g. aging, and research services in the production, armaments, automotive and food industries.

2. Resource management

In MARCO's medium-sized business dealing with industrial 3D printing, geometry measurements, material strength tests, environmental tests, as well as research services for the manufacturing, armaments, automotive and food industries, the key materials and resources are primarily advanced devices, consumables and specialized software. Preparation for the implementation of the Circular Economy (Circular Economy) in such an enterprise requires focusing on the effective use of resources, recycling and waste minimization. Here are the key aspects:

Devices and Equipment:

3D printers and scanners: Invest in energy-saving, long-lasting, easy-to-maintain devices.

Measurement and Test Equipment: A selection of devices with high performance and reliability.

Consumables:

3D printing filaments and resins: Preference for biodegradable or easily recyclable materials.

Test and Research Materials: Using recycled or eco-friendly materials wherever possible.

Energy and Energy Management:

Renewable energy sources:

Using renewable energy sources to power devices.

Energy efficiency: Optimizing the energy consumption of devices and lighting.

Software and Data Management:

Advanced software:

Effective management of production and research processes.

Optimizing data use: Reducing redundancy and using information efficiently.

Waste Management and Recycling:

Material recycling:

Effective use of waste from production processes.

Waste minimization: Optimizing processes to reduce waste.

Transport and logistics:

Logistical efficiency: Optimizing delivery and transportation to minimize your carbon footprint.

Use of ecological vehicles: Electric or hybrid vehicles for logistics departments.

Education and Environmental Awareness:

Employee training: Raising environmental awareness and promoting sustainable development practices.

Implementing circular economy principles in organizational culture: Promoting sustainable practices throughout the enterprise.

The implementation of the Circular Economy in such an enterprise requires not only the appropriate selection of materials and equipment, but also conscious management of processes and human resources. It is a comprehensive process that requires involvement at many levels of the organization.

3. Waste and disposal

In MARCO's medium-sized business with 100 employees, which deals with industrial 3D printing and scanning, geometric and strength measurements, environmental testing and research services for various industries, the main types of waste include 3D printing waste, electronic waste, chemical waste from laboratories, as well as office waste. Here are some ways to reduce the amount of this waste and recycle it in the context of implementing the Circular Economy (Circular Economy):

3D Printing Waste:

Material recycling: Waste filaments and resins from 3D printing can be collected and processed to be reused in production.

Print Optimization: Using software to optimize 3D models to minimize waste.

Electronic Waste:

Recycling programs:

Organizing appropriate recycling of waste electronic equipment.

Long-term equipment investments: Purchase durable and easy-to-maintain equipment to extend its life.

Chemical Waste:

Safe Disposal: Ensuring the safe storage and disposal of chemicals and other hazardous materials.

Minimizing the use of chemicals: Using alternative, less harmful substances where possible.

Office Waste:

Paper consumption reduction:

Introduction of digital document circulation, limiting printing to the necessary minimum.

Recycling of paper and other office supplies: Effective separation and recycling of paper, plastic, metal, etc.

Energy and Water Management:

Efficient use of resources: Optimization of energy and water consumption in production and research processes.

Use of renewable energy: Use of renewable energy sources to power facilities and equipment.

Education and Environmental Awareness:

Employee training: Staff education in sustainable waste management and circular economy practices.

Promoting sustainable development: Implementing circular economy principles in organizational culture and business strategy.

Implementing these practices in a medium-sized industrial 3D printing and research company can significantly contribute to reducing waste, lowering operating costs, and improving the company's image as environmentally conscious and sustainable.

4. Life cycle of products and services

In a medium-sized, ultra-modern business such as MARCO, employing 100 employees and specializing in industrial 3D printing and scanning, geometric and strength measurements and environmental tests, which operates on a global scale as a leader in the field of technology, the offer of products and services is wide and diversified. These are MARCO's main services and products:

Products:

1. **Custom 3D Prints**:
 - Specialized components for the defense, automotive, aviation and medical industries.
 - Prototypes and models for the production and food sectors.
2. **Advanced Printing Materials**:
 - Innovative filaments and resins developed for specific applications in various industries.

Services:

1. **Industrial 3D Scanning**:
 - Accurate scanning of components and objects for reverse engineering, quality control, and product design.
2. **Geometry and Strength Measurements**:
 - Tests of breaking forces, material strength and structural analyzes for various industries.
 - Testing the performance and durability of materials under various conditions.
3. **Environmental and Aging Tests**:
 - Environmental simulations and aging tests to assess the durability and resistance of materials.
 - Research on the impact of environmental factors on products and materials.
4. **Research and Development Services**:
 - Cooperation with clients in the field of R&D, development of non-standard solutions and innovations.
 - Consultations and technical expertise in the field of materials engineering and processing.

Global Operations:

1. **Support for Various Industries worldwide**:
 - Providing solutions to global clients from various sectors.
 - Ability to quickly adapt to specific market and regulatory requirements around the world.
2. **International Partnerships and Cooperation**:
 - Building relationships with international business and academic partners.
 - Cooperation with universities and research centers to develop new technologies.

Innovation and Technology:

1. **Pioneering Technology Solutions**:
 - Constant investments in the latest technologies and innovations.
 - Development of own patents and unique technological solutions.
2. **Technical Expertise**:
 - A team of qualified engineers and specialists in the field of 3D printing, materials engineering and data analysis.

This business, as a technology leader, offers its clients not only advanced products and services, but also expert support and innovative solutions, adapted to the requirements and challenges of modern global markets.

In an ultra-modern company like MARCO, there are many strategies to extend the life cycle of products and promote the production and provision of services in accordance with the principles of the Circular Economy (Circular Economy):

1. Design and Production Optimization:

Design for Durability: Creating products that are easy to repair, upgrade and recycle.

Modular Design: Allowing individual product components to be easily replaced or updated.

2. Advanced Materials and Technologies:

Use of Durable Materials: Use of materials with high strength and long service life.

Material Innovations: Development of new, more durable and ecological printing materials.

3. Effective Use of Resources:

Material Recycling: Reusing starting materials, e.g. resins and filaments in 3D printing.

Waste Management: Effective recycling of production and office waste.

4. Maintenance and Service:

Maintenance and Repair Programs: Regularly service equipment to prevent breakdowns and extend its life.

Offering Repair Services: Providing customers with repair and maintenance services for purchased products.

5. Education and Ecological Awareness:

Trainings and Workshops: Educating employees and customers about sustainable development and circular economy.

Promotion of Sustainable Development: Actively promoting sustainable development practices in external communications and marketing.

6. Digital Optimization and Innovation:

Digital Production Optimization Tools: Using advanced algorithms to minimize material and energy waste.

Software Development: Creating your own solutions for production, logistics and supply chain management.

7. Sustainable Transport and Logistics:

Effective Logistics: Transport optimization, use of ecological vehicles, minimization of carbon footprint.

8. Cooperation and Partnerships:

Cooperation Networks: Building relationships with other companies and institutions to exchange knowledge and resources.

Implementing these strategies can help MARCO not only achieve its circular economy goals, but also increase efficiency, reduce costs and enhance its reputation as an environmentally responsible technology leader.

5. Supply chain and supplier selection

The portfolio of services and intermediate products offered at MARCO is very diverse and technologically advanced. Here are some of them:

Industrial 3D Printing Services:

1. **Prototyping and Serial Production**:

- Creating product prototypes for various industries, including automotive, aviation and medical.
- Series production of parts using 3D printing, offering speed and flexibility.

2. **Product Personalization**:

- Possibility to adapt products to individual customer needs, for example in the medical industry (e.g. prostheses, implants) or interior design.

3D Scanning Services:

1. **Reverse Engineering**:

- Creating digital models of physical objects for design or reconstruction purposes.
- Analysis and optimization of existing products.

2. **Measurements and Quality Control**:

- Accurate geometric measurements of complex components.
- Quality control in industrial production.

Material Tests:

1. **Material Properties Analysis**:

- Strength tests, tests of the chemical composition and physical properties of materials.
- Development and innovation in the field of new materials.

2. **Environmental Tests**:

- Tests of the impact of environmental conditions on materials, for example aging, corrosion, or exposure to various temperatures and pressures.

Intermediate Products:

1. **Advanced 3D Printing Materials**:

- Specialized filaments, powders and resins for 3D printing, tailored to specific industry requirements.
- Ecological and innovative printing materials.

2. **Software and Applications**:

- Software solutions for optimizing 3D printing, scanning, design and data analysis processes.
- Applications supporting production and logistics management in the context of 3D technology.

Additional services:

1. **Consultations and Technical Advice**:

- Support in technology selection, product design and optimization of production processes.
- Consulting in the field of innovation and the use of new technologies.

2. **Training and Workshops**:

- Organization of technical training and workshops in the field of 3D printing, 3D scanning and materials engineering.

Such an ultra-modern MARCO business combines advanced technology with expert knowledge to provide innovative solutions for various industry sectors, while responding to the specific needs of the global market.

MARCO, in accordance with its Development Strategy, systematically reduces its impact on the environment by selecting suppliers or changing the raw materials used, among others through:

1. Selecting Sustainable Suppliers:

- **Certified Suppliers**: Work with suppliers with ecological certifications, such as ISO 14001, which demonstrates their commitment to eco-friendly practices.
- **Local Sources**: Preferring local suppliers to reduce the carbon footprint of transportation.

2. Using Sustainable Materials:

- **Ecological Printing Materials**: Selection of 3D printing materials that are biodegradable or recycled, e.g. bioplastics, recycled filaments.
- **Limiting the Use of Non-Eco-Friendly Materials**: Avoiding materials that are difficult to recycle or are harmful to the environment.

3. Effective Resource Management:

- **Material Usage Optimization**: Use of advanced technologies to minimize production waste, e.g. optimization of 3D printing processes.
- **Production Waste Recycling**: Introducing recycling systems for production waste, including printing materials and scraps.

4. Innovative Energy Technologies:

- **Energy-saving devices**: Investments in modern, energy-saving machines and devices.
- **Use of Renewable Energy Sources**: Installation of solar panels or purchase of energy from renewable sources.

5. Sustainable Transport and Logistics:

- **Eco-logistics**: Optimization of the transport of products and raw materials in order to reduce exhaust emissions, use of electric or hybrid vehicles.

6. Education and Environmental Awareness:

- **Training for Employees**: Educating employees about circular economy principles and sustainable development practices.
- **Communication with Customers and Partners**: Promoting ecological practices in interactions with customers and business partners.

MARCO's pursuit of circular economy not only contributes to reducing its negative impact on the environment, but can also bring financial benefits through more efficient use of resources and better waste management, as well as strengthening the company's image as a leader in sustainable development.

6. Redesign and innovation

Despite the use of ultra-modern solutions by MARCO in many aspects of its operations There are many opportunities to introduce changes and technological improvements that will strengthen the goals of the Circular Economy (Circular Economy), including:

1. Optimization of Production Processes:

- **Advanced Design Software**: Use CAD and simulation software to help optimize designs to reduce waste and use materials.
- **Energy Efficiency**: Investments in energy-saving devices and machines that reduce energy consumption during production.

2. Use of Sustainable and Recycled Materials:

- **Sustainable Printing Materials**: Using biodegradable or recycled filaments in 3D printing.
- **Materials Recycling**: Implementation of systems for recycling production waste, such as metal, plastic or resin scraps.

3. Digitization and Automation:

- **Process Automation**: Introduction of automated production management systems, which minimizes waste and increases efficiency.
- **Documentation Digitization**: Reducing paper consumption by digitally storing documents and reports.

4. Application of Advanced Technologies:

- **3D Print on Demand**: Manufacture parts and products only after receiving the order, reducing overages and inventories.
- **3D Scanning and Reverse Engineering**: Enables more precise design and reduces the need for physical prototyping.

5. Energy Savings and Renewable Energy Sources:

- **Renewable Energy Sources**: The use of solar, wind or other renewable energy to power operations.
- **Energy Management Systems**: Monitoring and optimizing energy consumption throughout the enterprise.

6. Education and Environmental Awareness:

- **Training Programs for Employees**: Educating employees about sustainable development practices and circular economy.

- **Stakeholder Communication**: Informing customers about sustainable practices and the benefits of green choices.

The introduction of these changes may contribute to NARCO not only minimizing the negative impact on the environment, but also increasing operational efficiency and will further strengthen MARCO's position as an innovative leader.