Green Spacecraft Manufacturing Guideline

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Axelspace Corporation
Spacecraft Manufacturing Alliance

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1. Green Procurement

Axelspace Corporation (hereafter, “Axelspace”) procures products, semi-processed products, parts, raw materials, auxiliary materials, packing materials, packaging material, etc. (hereafter, “products”) from multiple suppliers. To comply with environmental laws, regulations, and other requirements related to chemical substances and to achieve a sustainable society, Axelspace will conduct procurement in compliance with the following guidelines.

#	Items	Details
1	Selection of suppliers that are actively involved in environmental conservation and chemical substance management	Axelspace recommends its suppliers to carry out the following initiatives, and will consider making them mandatory as part of future arrangements: ・ Promotion of an environmental management system framework ・ Establish an environmental policy and pledge to continuously improve environmental conservation activities and comply with laws and regulations ・ Ensure that all employees are familiar with the environmental policy and that the policy is made clear to those outside the company ・ Establish goals on environmental conservation and implement action plans ・ Acquire external certifications for the environmental management system (e.g., ISO14001, KES, Eco-Action 21, etc.).
2	Setting of conditions for initiating and continuing business with suppliers	To promote procurement of products from suppliers who are actively willing to address environmental issues, Axelspace requires suppliers to comply with the following initiatives as conditions for initiating and continuing business with the aforementioned supplier: ・ Supplier shall make efforts to reduce their environmental impact during the process of fulfilling their contractual obligations and in the procurement process ・ Supplier shall cooperate when requested to submit reports and materials necessary for the execution of Axelspace’s business or for the safety, disaster prevention, pollution control, or environmental management of procured products or our products incorporating procured products ・ Axelspace shall establish standards for the concentration of hazardous chemical substances contained in procured products in accordance with

		the laws and regulations of Japan or other countries, and Axelspace may notify the supplier in writing of the procured products to be covered by the standards, the types of chemical substances, and the permissible limits for their inclusion, and suppliers shall not deliver procured products in violation of these standards ・ Supplier shall cooperate when requested to submit data on the quantity or composition ratio of chemical substances in procured products
3	Selection of low environmental impact products	・ Axelspace shall procure products that are designed and manufactured with attention to environmental impact, safety, recyclability, and energy conservation ・ Axelspace shall not use products that contain hazardous chemicals
4	Improvement of efforts	・ Axelspace shall work to continuously improve on their efforts involving environmental conservation and chemical management

2. Green Manufacturing and Testing

Axelspace will manufacture and test satellites in accordance with the table below to reduce the environmental impact of the satellite manufacturing process including procurement operations, delivery and inspection of procured products, satellite assembly, (environmental) testing of the satellite, and various supporting processes.

#	Items	Details
1	Paperless practices in the manufacturing process	・ Minimize the use of paper in the manufacturing process and aim to approach zero paper usage whenever possible
2	Efforts to reduce electricity consumption during manufacturing processes (energy conservation efforts)	・ Continuously reduce electricity consumption in the manufacturing process
3	Recycling (metal chip processing, scrap material)	・ Recycle metal chips generated during part processing, waste oil from manufacturing processes, etc.
4	Automated electrical and operational testing	・ Improve operational efficiency by automating various electrical and operational tests of satellites, reducing human movement, implementing 24-hour testing, etc.
5	Elimination of redundancies throughout the manufacturing process (e.g., procured product inspection process)	・ Aim to achieve zero redundancies throughout the manufacturing process.
6	Establishing optimal quality control levels	・ Reduce excessive quality settings and testing ・ Reduce excessive clean room usage time

3. Green Transportation

Based on the concept of the versatile satellite bus, Axelspace will comply with the table below to reduce the use of accompanying materials and waste during transportation.

#	Items	Details
1	Standardized and reusable shipping containers	・ Standardize and reuse satellite shipping containers
2	Reduction and recycling of accompanying materials during transportation	・ Reduction of cushioning materials, pallets, and other accompanying materials during transportation, and recycling of vinyl, etc.
3	Efforts to reduce CO2 emissions during transportation	・ Continuously reduce CO2 emissions in the transportation process
4	Reduction of excess transport quality (optimization of transport quality)	・ Avoid excessive quality transportation, even for satellites and spacecraft, and determine the necessary requirements for optimal transportation
5	Reduction of GSE (Ground Support Equipment)	・ Reduce transportation volume by reducing the amount of non-satellite items like inspection and support equipment (GSE) transported to the launch site ・ Implement measures such as on-site storage of tools, etc., in cooperation with forwarders and launch operators