CONSTRUCTION INDUSTRY COUNCIL

CIC GREEN PRODUCT CERTIFICATION

Assessment Standard

Technical Requirements

Water Pump

(Version 2)

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Water Pump

Summary of Assessment Criteria

CORE CRITERIA

Criteria	Requirements	Verification	Points		Index
			Basic	+Bonus	
Product Information	Provide following information with delivered products or made accessible to public: • Country of origin • Basic product specifications • Installation method • Instructions for consumer product disposal • Operation & Maintenance Manual	Documentation including, but not limited to, product catalogue, technical datasheet, and webpages	**5**	-	4.1.1
ENVIRONMENT					
Human Toxicity and Ecosystem Impact	Noise Level: The noise generated by pumps shall not exceed the requirement as stated in Table 2 and Table 3.	Documentation including, but not limited to, product catalogue and test report(s).	**15**	+10	4.4.3.2
PERFORMANCE					
Efficiency Metrics	Motor Efficiency: Product shall meet the following requirement of efficiency levels under IEC 60034-30-1:2014: • 15 Basic Points for achieving IE 3. • 10 Bonus Points for achieving IE 4.	Documentation including, but not limited to, product catalogue and test report(s).	**15**	+10	4.5.1.1
System Performance and Reliability	Guarantee Point Acceptance Grades: Products shall achieve the guarantee point acceptance grade for pump head, flow, power, and efficiency as shown in the Table 4.	Documentation including, but not limited to, product label, product catalogue, test report or a valid ISO 9906 certificate issued by accredited certification body.	**15**	-	4.5.2.1
		Subtotal:	**50**	+20	

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NON-CORE CRITERIA

Criteria	Requirements	Verification	Points +Bonus	Index
CARBON				
CFP Quantification	Provide a 3rd party endorsed life cycle assessment report with the carbon footprint of products (CFP), covering at least A1 to A3 OR a product level Environmental Product Declaration (EPD).	CFP quantification report OR Environmental Product Declaration (EPD)	+10	4.2.1
RESOURCE				
Circularity	Recyclability: Developed a recycling plan for the product and declared options for reuse, recycling, recovery, and disposal.	Recycling plan	+5	4.3.1.1
	Packaging Requirement: The packaging materials shall not contain halogenated plastics; *OR* Shall be comprised of 100% recycled materials, readily recyclable materials, or decomposable materials; *OR* Shall not be impregnated, labelled, coated, or otherwise treated in a manner which would prevent or significantly limit recycling.	Documentation on packaging materials used	+5	4.3.1.2
	Design for Disassembly: Water pumps incorporated design for disassembly features including, but not limited to, pump cover, impeller, and pump shaft.	Documentation including, but not limited to, product label, product catalogue, and written declaration	+5	4.3.1.3
Waste Management	Waste Management Plan: Implement effective Waste Management Plan detailing the policies, procedures, and/or a waste management program covering manufacturing operations.	Waste Management Plan	+5	4.3.2.1
Water Management	Option A: Water Consumption Reporting: Report both potable and non-potable water usage in the production process of the past year.	Water consumption report	+5/ +10	4.3.3.1
	Water Recycling Program: Develop and implement a water recycling program during the manufacturing process.	Documentation on water recycling		4.3.3.2
	Option B: Water Management System: Process valid certificate under ISO 14046: Water Footprint Assessment.	ISO 14046 Certificate issued by accredited certification body		4.3.3.3

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Criteria	Requirements	Verification	Points +Bonus	Index
Energy Management	Option A: Energy Management Plan: Implement effective energy management policies and procedures and/or an energy management programme.	Energy management plan	+5/ +10	4.3.4.1
	Option B: Energy Management System: Possess valid certificate under ISO 50001: Energy management systems.	ISO 50001 Certificate issued by accredited certification body		4.3.4.2
ENVIRONMENT				
Environmental Management	Environmental Management System: Manufacturer shall possess valid certification of ISO 14001 OR EU Eco-Management and Audit Scheme (EMAS).	ISO 14001 or EMAS Certificate issued by accredited certification body	+5	4.4.1.1
Regional Product	Regional Manufactured Equipment: The manufacturing location should be located within an 800km radius of HKSAR by road transportation; within a 1,600km radius by rail transportation; or within a 4,000km radius by sea transportation.	Location map with distance between manufacturer and HKSAR	+5	4.4.2.1
Human Toxicity and Ecosystem Impact	Hazardous Substances: Hazardous substances shall not exceed the acceptance levels specified in Section 4.4.3.1.	Laboratory test report(s) or self-declaration letter	+5/+10	4.4.3.1
PERFORMANCE				
Product Life	Mechanical Seal: Products shall have a mechanical seal designed for the working and testing pressures.	Documentation including, but not limited to, product label, product catalogue	+5	4.5.3.1
INNOSMART				
Innovations & Additions	Achieving significant, measurable environmental performance using new practices, technology, and strategy not addressed in this Standard. OR Incorporating various smart technologies to improve efficiency, reduce energy consumption, and optimize performance.	Narrative with supporting documents	+5	4.6.1
		Subtotal:	+80	

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1. INTRODUCTION

1.1 PURPOSE

The CIC Green Product Certification (the "Scheme") is a green product labelling scheme, owned by the Construction Industry Council (CIC) and implemented by the Hong Kong Green Building Council (HKGBC). The primary goal of the scheme is to support Hong Kong's transition to a low-carbon economy by encouraging the adoption of environmentally friendly construction practices.

With the Green Product Certification, various stakeholders, including consumers, building professionals, construction practitioners, and policymakers, can easily and unequivocally identify environmentally preferable construction materials and building products. This certification serves as a reliable indicator of a product's sustainability, helping to drive market demand for greener options.

To ensure the credibility and effectiveness of the certification, the CIC and the HKGBC has jointly developed this Technical Assessment Standards (the "Standard"), which sets out the assessment criteria and their benchmarks to govern the application and award of a grade under the Scheme. The comprehensive assessment evaluates the overall sustainability of construction materials and building products across multiple dimensions. These dimensions include environmental impact, resource efficiency, technical performance, and the use of smart manufacturing technologies.

The Standard is divided into two main parts:

- General Requirements (Refer to General Requirements provided in separate document). This part introduces Scheme's framework, outlines the application procedure, and details the grades.

- Technical Requirements (This document refers). This part defines the principles, requirements, and guides for quantifying and reporting the products' carbon footprint (CFP), along with other sustainability assessment criteria and scoring standards.

This Standard neither modifies nor supersedes laws and regulations. Compliance with this Standard is not a substitute for, and does not assure, compliance with any applicable laws or regulations. Compliance with all applicable laws and regulations is a prerequisite for the manufacturing and marketing of the product.

The Scheme is owned by the Construction Industry Council (CIC), 38/F, COS Centre, 56 Tsun Yip Street, Kwun Tong, Kowloon, Hong Kong; and operated by Hong Kong Green Building Council (HKGBC), 1/F, Jockey Club Environmental Building, 77 Tat Chee Avenue, Kowloon Tong, Hong Kong, Phone: +852 3994 8888, Email: cicgpc@hkgbc.org.hk

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1.2 BACKGROUND

Water pumps are used to move fluid from one location to another. They are mechanical devices which transform mechanical work into fluid energy. Static fluid pressure and flow energy are increased to maintain steady flow. Pumps give the ability to control water flows in the means of:

i) Taking fluid where it is needed with the desired pressure and flow;
ii) Taking away from areas where it is not needed;
iii) Controlling flow volume, pressure and timing; and
iv) Circulating liquid throughout a distribution system (e.g. cooling tower throughout machines and equipment).

There are two major areas in pumps which are the suction area and discharge area. Pumps perform mechanical work through suction as inputs and deliver energy with the discharge area as output. Water pump can place a significant burden on the environment. With increasing environmental claims of water pump in the market, a more comprehensive and systematic approach to assess the environmental impacts of the water pump shall be developed. The aim of this Standard is to help designers and end-users choose greener products by conserving resources, reducing the amount of waste disposal in landfills, and reducing the impact to human health throughout the life cycle of air handling unit. The development of the assessment criteria in this Standard has made references to worldwide relevant eco-labelling schemes and some existing life cycle assessment (LCA) studies.

2. SCOPE

The scope of this Standard is applicable different types of water pumps, including horizontal or vertical, multi-stage or single-stage, centrifugal or axial, etc. Other system components are not included in this Standard.

Note:

ONE application is only eligible for **ONE** product series. All the related products have to be listed on the submitted documents. Each application should specify the product code / serial number.

3. DEFINITIONS

ASTM:	American Society for Testing and Materials
GB:	Chinese National Standards
Biological Cycle:	The cycle by which materials or parts are released to, and ideally reprocessed in, the environment via composting, biodegradation, nutrient extraction, or other biological metabolic pathways
BS:	British Standards
BMS:	Building Management System

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CIC:	Construction Industry Council
CNAS:	China National Accreditation Service for Conformity Assessment
HKAS:	Hong Kong Accreditation Service
HKGBC:	Hong Kong Green Building Council
HOKLAS:	The Hong Kong Laboratory Accreditation Scheme
IE:	International Efficiency
IEC:	International Electrotechnical Commission
ISO:	International Organization for Standardization
LWA	The A-weighted sound power level
MSDS:	Material Safety Data Sheet. To qualify as suitable, MSDS and information therein must not be more than 5-years old
MiMEP:	Multi-trade integrated Mechanical, Electrical and Plumbing
Technical Cycle:	The cycle by which a product's materials or parts are reprocessed for a new product use cycle via recycling, repair, refurbishment, remanufacturing, or reuse
Third-party:	An entity without any financial interest or stake in the sales of the product or service being evaluated or other conflict of interest
VOC:	Volatile organic compounds. VOCs are organic chemical compounds that have high enough vapour pressures under normal conditions to significantly vaporize and enter the atmosphere. VOCs are major contributors or precursors to the formation of ozone and smog.

4. EVALUATION CRITERIA

A product to be assessed shall meet all the minimum requirements of the "Core Criteria" in order to be awarded a "Green" (i.e. a "pass" grade) grade under the Scheme. Bonus points may be awarded if the product meets the "Non-core Criteria" and a "Bronze", "Silver", "Gold", or "Platinum" grade will be awarded according to the total points accumulated, as shown in Table 1.

Table 1: Benchmarks for grading

Points achieved	Grade to be awarded
90 or above	Platinum
80 – 89	Gold
70 – 79	Silver
60 – 69	Bronze
50 – 59	Green
Below 50	No grade

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All submissions and documentations shall be endorsed by the Chief Executive Officer or other authorised persons of the Applicant to demonstrate conformance to the assessment criteria. All certification, laboratory reports, and documentation must be valid during the assessment process and labelling period. The date of issue of all laboratory reports and documentation shall be within 5 years from the first application submission date.

If the certification expires during the labelling period or upon renewal, the applicant is required to provide an updated and valid certification. Failure to resubmit the required certification will result in the revocation of CIC Green Product Certificate without compensation.

The chemical tests should be conducted by either a third party or the manufacturer, providing that they have obtained ISO 17025 certification or relevant national accreditations, such as HOKLAS or CNAS.

4.1 BASIC INFORMATION

4.1.1 Product Information – Core Criteria

The Applicant is required to achieve 5 Basic Points under this section.

Requirements

5 Basic Points for providing following information with delivered products or made accessible to public:

- Country of origin
- Basic product specifications
- Installation method
- Instructions for consumer product disposal
- Operation & Maintenance Manual

Verification

Documentation showing the product information and instructions, including, but not limited to, product catalogue, technical datasheet, webpages, and/or any other information freely accessible by customers.

4.2 CARBON

4.2.1 CFP Quantification – Non-core Criteria

The Applicant can achieve maximum 10 Bonus Points under this section.

Requirements

10 Bonus Points for providing life cycle assessment report for quantifying and reporting the carbon footprint of products (CFP), covering at least A1 (raw material supply), A2

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(transport), and A3 (manufacturing process). This can be achieved by either of the following:

Conduct CFP study report in accordance with ISO 14067:2018, GB/T 24067-2024, CIBSE TM 65 or equivalent

OR

10 Bonus Points for providing the product's CFP value from a product level EPD issued in accordance with ISO 14067:2018, ISO 21930:2017, GB/T 24067-2024, GB/T 24025-2009 or BS EN 15804:2012.

Verification

CFP quantification report or Environmental Product Declaration endorsed by a third-party fulfilling the above requirements.

4.3 RESOURCE

4.3.1 Circularity

The Applicant can achieve maximum 15 Bonus Points under this section.

4.3.1.1 Recyclability – Non-core Criteria

Requirements

5 Bonus Points for demonstrating that the manufacturer has developed a recycling plan for the product and declared options for reuse, recycling, recovery, and disposal. The plan shall include the following and be made available to public:

- Designate all homogeneous materials in the product as being intended for technical and/or biological cycles and define the intended cycling pathway(s) for each material; and
- Identify potential partners for product reuse, recycling, and recovery in accordance with the intended cycling pathway(s); and
- For products and materials intended for municipal recycling, the product and/or material must be compatible for municipal cycling systems (e.g., painted plastics and plastic laminated paper are not currently compatible for municipal recycling); and
- Instructions for how to cycle the product shall be made publicly available.

Verification

Documentation of recycling plan including, but not limited to, product catalogue, MSDS, and written declaration.

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4.3.1.2 Packaging Requirement – Non-core Criteria

Requirements

5 Bonus Points for minimizing the wastage from all primary packaging materials. The packaging materials shall achieve either of the following:

The packaging materials shall not contain halogenated plastics

OR

The packaging materials shall be comprised of 100% recycled materials, readily recyclable materials, or decomposable materials

OR

The packaging shall not be impregnated, labelled, coated, or otherwise treated in a manner which would prevent or significantly limit recycling.

Verification

Documentation describing the packaging materials used as well as their chemical composition (if any and where applicable), treatment process, and recyclability.

4.3.1.3 Design for Disassembly – Non-core Criteria

Requirements

5 Bonus Points for water pumps incorporated design for disassembly features including, but not limited to, pump cover, impeller, and pump shaft.

Verification

Documentation including, but not limited to, product label, product catalogue, and written declaration.

4.3.2 Waste Management

The Applicant can achieve maximum 5 Bonus Points under this section.

4.3.2.1 Waste Management Plan – Non-core Criteria

Requirements

5 Bonus Points for implementing an effective waste management plan detailing the policies, procedures, and/or a waste management program covering manufacturing operations. The waste management plan should include, but should not be limited to the following information:

- Initiatives taken to reduce waste generation and improve recovery/recycling of waste; and
- Initiatives implemented for recovery of post-consumer and/or pre-consumer waste that can be re-introduced into the manufacturing process; and

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- Other environmental benefits or constraints associated with waste minimisation objectives and processes.

Verification

Documentation of waste management plan detailing the above, supported by organizational policy or equivalent documents.

4.3.3 Water Management

The Applicant can achieve maximum 10 Bonus Points under this section.

The Applicants can select one of the options below and comply with any or all the requirements under that option to achieve the associated points.

Option A:

4.3.3.1 Water Consumption Reporting – Non-core Criteria

Requirements

5 Bonus Points for reporting both potable and non-potable water usage in the production process of the past year.

Verification

Water consumption report, supported by water usage data acquired from water meter, water sub-meter, water bill, or other equivalent documents.

4.3.3.2 Water Recycling Program – Non-core Criteria

Requirements

5 Bonus Points for developing and implementing water recycling program during the manufacturing process.

Verification

Documentation demonstrating the implementation of water recycling program, supported by drawings, water usage data acquired from water sub-meter, or other equivalent documents.

Option B:

4.3.3.3 Water Management System – Non-core Criteria

Requirements

10 Bonus Points for possessing valid certificate under ISO 14046: Environmental management – Water footprint – Principles, requirements and guidelines.

ISO 14046 is a framework for assessing the water footprint of products, processes, and organizations. It provides principles, requirements, and guidelines for conducting and reporting water footprint assessments. It helps organizations evaluate and improve their water management practices.

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Verification

A valid ISO 14046 certificate issued by accredited certification body.

4.3.4 Energy Management

The Applicant can achieve maximum 10 Bonus Points under this section.

The Applicants can select one of the options below and comply with any or all the requirements under that option to achieve the associated points.

Option A:

4.3.4.1 Energy Management Plan – Non-core Criteria

Requirements

5 Bonus Points for implementing effective energy management policies and procedures and/or an energy management programme including, but not limited to, the following items:

- Energy efficiency initiatives: Manufacturer should undertake specific initiatives to reduce energy use and improve energy efficiency throughout their operations. This could include upgrading to more efficient equipment, optimizing production processes, or implementing energy-saving technologies; and
- Supplier requirements: Manufacturers should extend their energy management efforts to their supply chain by establishing requirements or initiatives for suppliers and contract manufacturers to improve their energy performance where possible.

Verification

Energy Management Plan detailing the above, supported by organizational policy or other equivalent documents.

Option B:

4.3.4.2 Energy Management System – Non-core Criteria

Requirements

10 Bonus Points for possessing valid certificate under ISO 50001: Energy management systems — Requirements with guidance for use.

ISO 50001 provides a framework for organizations to establish, implement, maintain, and improve an Energy Management System. The goal is to help organizations improve their energy performance, increase energy efficiency, and reduce energy costs and greenhouse gas emissions. By achieving ISO 50001 certification, manufacturers can demonstrate their commitment to energy efficiency and sustainability.

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Verification

A valid ISO 50001 certificate issued by accredited certification body.

4.4 ENVIRONMENT

4.4.1 Environmental Management

The Applicant can achieve maximum 5 Bonus Points under this section.

4.4.1.1 Environmental Management System – Non-core Criteria

Requirements

5 Bonus Points for possessing valid certificate under ISO 14001: Environmental management systems — Requirements with guidance for use or EU Eco-Management and Audit Scheme (EMAS).

The target of the environmental management system shall be set to reduce the environmental impacts during the manufacturing process which include, but are not limited to, the reduction of hazardous substance emissions, energy consumption, CO_2 emissions, secondary environmental load, waste management, water management, etc.

ISO 14001 is the international standard which provides an outline of how to meet the environmental policy and objectives for the business of the applicant.

Eco-Management and Audit Scheme (EMAS) is an environmental management tool which enables organisations to assess, manage, and continuously improve their environmental performance.

Verification

A valid ISO 14001 or EMAS certificate issued by accredited certification body.

4.4.2 Regional Product

The Applicant can achieve maximum 5 Bonus Points under this section.

4.4.2.1 Regional Manufactured Equipment – Non-core Criteria

Requirements

5 Bonus Points for products that are manufactured within 800km radius of HKSAR by road transportation; within a 1,600km radius by rail transportation; or within a 4,000km radius by sea transportation. The distance is measured by the direct distance, not by actual travel distance.

Verification

Documents demonstrating the location of the manufacturer and a map showing the distance between the manufacturer and HKSAR.

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4.4.3 Human Toxicity and Ecosystem Impact

The Applicant can achieve maximum 35 Points under this section.

The Applicant is required to achieve 15 Basic Points under this section. Additionally, the Applicant can achieve maximum 20 Bonus Points under this section.

4.4.3.1 Hazardous Substances – Non-core Criteria

Requirements

Paint Used

5 Bonus Points are awarded if the product meets the requirements for paints used.

Limit the concentration of Lead, Cadmium, Chromium (VI), Mercury, or their compounds in paint below 0.01% by weight.

Limit the concentration of VOC content in paint below 250g/L.

Flame Retardant

5 Bonus Points are awarded if the product meets the requirements for flame retardant.

Concentration of the flame-retardants in the product shall be below 0.1% by weight of the product. The restricted fire retardants including the following types:

- Polybrominated diphenyl ether
- Polybrominated biphenyls
- Short-chained chlorinated paraffin
- Halogenated organic compounds
- Hexabromocyclododecane

Products shall be tested based on the requirement as stated in IEC 62321-4:2013, IEC 62321-5:2013, IEC 62321-7-2:2017, IEC 62321-6:2015 (or the latest version). Other related testing methods are also acceptable with justification provided by the Applicant.

Verification

Laboratory test report(s) or self-declaration letter. The test report(s) shall be compiled according to IEC 62321 or other equivalent standards.

4.4.3.2 Noise Level – Core Criteria

Requirements

15 Basic Points for the noise generated by pumps not exceeding the requirement as stated in Table 2 and Table 3.

Additionally, 10 Bonus Points are awarded if the product noise level is lower than the requirement as stated in Table 2 and Table 3 by 3dB.

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Product shall be tested in accordance with relevant BS standard including but not limited to IEC 60034-9:2021 (or latest version); other related testing methods are also acceptable with justification provided by the applicant.

IEC 60034-9:2021 specifies test methods for the determination of sound power level of rotating electrical machines.

Verification

Documentation including, but not limited to, product catalogue and test report(s).

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Table 2: Maximum A-weighted sound power level, LWA in dB, at no-load
(excluding motors according to Table 3),(Method of cooling, IC code, see IEC 60034-6), (Method of protection, IP code, see IEC 60034-5)

Rated speed nN min−1	**nN ≤ 960**			**960 < nN ≤ 1320**			**1320 < nN ≤ 1900**			**1900 < nN ≤ 2360**			**2360 < nN ≤ 3150**			**3150 < nN ≤ 3750**		
Methods of cooling (simplified code)	**IC 01 IC 11 IC 21**	**IC 411 IC 511 IC 611**	**IC 31 IC 71W IC 81W IC 8A 1W 7**	**IC 01 IC 11 IC 21**	**IC 411 IC 511 IC 611**	**IC 31 IC 71W IC 81W IC 8A 1W 7**	**IC 01 IC 11 IC 21**	**IC 411 IC 511 IC 611**	**IC 31 IC 71W IC 81W IC 8A 1W 7**	**IC 01 IC 11 IC 21**	**IC 411 IC 511 IC 611**	**IC 31 IC 71W IC 81W IC 8A 1W 7**	**IC 01 IC 11 IC 21**	**IC 411 IC 511 IC 611**	**IC 31 IC 71W IC 81W IC 8A 1W 7**	**IC 01 IC 11 IC 21**	**IC 411 IC 511 IC 611**	**IC 31 IC 71W IC 81W IC 8A 1W 7**
	Note 1	**Note 2**	**Note 2**	**Note 1**	**Note 2**	**Note 2**	**Note 1**	**Note 2**	**Note 2**	**Note 1**	**Note 2**	**Note 2**	**Note 1**	**Note 2**	**Note 2**	**Note 1**	**Note 2**	**Note 2**
Rated output PN kW (or kVA)																		
1≤PN≤1,1	73	73	–	76	76	–	77	78	–	79	81	–	81	84	–	82	88	–
1,1<PN≤2,2	74	74	–	78	78	–	81	82	–	83	85	–	85	88	–	86	91	–
2,2<PN≤5,5	77	78	–	81	82	–	85	86	–	86	90	–	89	93	–	93	95	–
5,5<PN≤11	81	82	–	85	85	–	88	90	–	90	93	–	93	97	–	97	98	–
11<PN≤22	84	86	–	88	88	–	91	94	–	93	97	–	96	100	–	97	100	–
22<PN≤37	87	90	–	91	91	–	94	98	–	96	100	–	99	102	–	101	102	–
37<PN≤55	90	93	–	94	94	–	97	100	–	98	102	–	101	104	–	103	104	–
55<PN≤110	93	96	–	97	98	–	100	103	–	101	104	–	103	106	–	105	106	–
110<PN≤220	97	99	–	100	102	–	103	106	–	103	107	–	105	109	–	107	110	–
220<PN≤550	99	102	98	103	105	100	106	108	102	106	109	102	107	111	102	110	113	105
550<PN≤1100	101	105	100	106	108	103	108	111	104	108	111	104	109	112	104	111	116	106
1100<PN≤2200	103	107	102	108	110	105	109	113	105	109	113	105	110	113	105	112	118	107
2200<PN≤5500	105	109	104	110	112	106	110	115	106	111	115	107	112	115	107	114	120	109

NOTE 1 Typical enclosure classification IP22 or IP23.
NOTE 2 Typical enclosure classification IP44 or IP55.

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Table 3: Maximum A-weighted sound power level, LWA in dB, at no-load (For single speed three-phase cage induction motors IC411, IC511, IC611)

Shaft height, H mm	2 pole	4 pole	6 pole	8 pole
90	78	66	63	63
100	82	70	64	64
112	83	72	70	70
132	85	75	73	71
160	87	77	73	72
180	88	80	77	76
200	90	83	80	79
225	92	84	80	79
250	92	85	82	80
280	94	88	85	82
315	98	94	89	88
355	100	95	94	92
400	100	96	95	94
450	100	98	98	96
500	103	99	98	97
560	105	100	99	98

NOTE 1 Motors of IC01, IC11, IC21 may have higher sound-power levels as follows: 2 and 4 poles: + 7 dB(A); 6 and 8 poles: + 4 dB(A).

NOTE 2 The sound-power levels for 2 and 4 poles motors with shaft heights > 315 mm recognize a directional fan configuration. All other values are for bi-directional.

NOTE 3 Values for 60 Hz motors are increased as follows: 2 pole: + 5 dB(A); 4, 6 and 8 poles: + 3 dB(A).

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4.5 PERFORMANCE

4.5.1 Efficiency Metrics

The Applicant can achieve maximum 25 Points under this section.

The Applicant is required to achieve 15 Basic Points under this section. Additionally, the Applicant can achieve maximum 10 Bonus Points under this section.

4.5.1.1 Motor Efficiency – Core Criteria

Requirements

Product shall meet the following requirement of efficiency levels under IEC 60034-30-1:2014:

- 15 Basic Points are awarded for achieving IE 3.
- Additionally, 10 Bonus Points are awarded for achieving IE 4.

IEC 60034-30-1:2014 defines four IE (International Efficiency) classes for single speed electric motors that are rated according to IEC 60034-1 or IEC 60079-0 (explosive atmospheres).

Verification

Documentation including, but not limited to, product catalogue and test report(s).

4.5.2 System Performance and Reliability

The Applicant is required to achieve 15 Basic Points under this section.

4.5.2.1 Guarantee Point Acceptance Grades – Core Criteria

Requirements

15 Basic Points for products achieving any one of the guaranteed point acceptance grades for pump head, flow, power, and efficiency as shown in the following table. The tolerances are percentages of values guaranteed.

Table 4: Pump test acceptance grades and corresponding tolerance

Acceptance Grade	1U	1E	1B	2B	2U	3B
Flow (τ_Q)	+10%	±5%		±8%	+16%	±9%
Head (τ_H)	+6%	±3%		±5%	+10%	±7%
Power (τ_P)	+10%	+4%		+8%	+16%	+9%
Efficiency (τ_η)	≥0%		-3%	-5%		-7%

*τ_x (x = Q, H, P, η) stands for the tolerance of the indicated quantity.

For pumps with shaft power input of below 10 kW, the tolerances factors shall be the following:

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- Rate of flow, $\tau_Q = \pm 10\%$
- Pump total head, $\tau_H = \pm 8\%$

Product shall be tested in accordance with BS EN ISO 9906-2012 (or latest version); other related testing methods are also acceptable with justification provided by the applicant

BE EN ISO 9906-2012 specifies hydraulic performance tests for customers' acceptance of rotodynamic pumps (centrifugal, mixed flow and axial pumps, hereinafter "pumps"). This Standard specifies three levels of acceptance:

- Grades 1B, 1E and 1U with tighter tolerance;
- Grades 2B and 2U with broader tolerance;
- Grade 3B with even broader tolerance.

Grade 1 is the most stringent, and the "U" specifies having a unilateral tolerance band. The "B" specifies having a bilateral tolerance band. Acceptance grade 1E can be used when energy efficiency is of importance and is also bilateral.

Verification

Documentation including, but not limited to, product label, product catalogue, test report or a valid ISO 9906 certificate issued by accredited certification body.

4.5.3 Product Life

The Applicant can achieve maximum 5 Bonus Points under this section.

4.5.3.1 Mechanical Seal– Non-core Criteria

Requirements

5 Bonus Points for products having mechanical seal which is designed for the working and testing pressures.

Verification

Documentation including, but not limited to, product label, product catalogue.

4.6 INNOSMART

4.6.1 Innovations & Additions – Non-core Criteria

The Applicant can achieve maximum 5 Bonus Points under this section.

Requirements

5 Bonus Points for achieving significant, measurable environmental performance using new practices, technology, and strategy not addressed in this Standard.

OR

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Incorporating various smart technologies to improve efficiency, reduce energy consumption, and optimize performance.

Examples include the following:

- Multi-trade Integrated MEP (MiMEP)
- Smart Controls and Automation
- IoT-Enabled Smart Pump Systems
- Variable Frequency Drives

Verification

Report with a maximum length of 1,000 words, outline the objectives, solution, and evaluation of the performance achieved by the proposed Smart and Innovative Technologies; and

Include attachments that provide evidence of implementation, along with relevant technical specifications that support the claims made in the report.

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5. SCORING

The points for meeting each criterion stated in this Standard are summarized below.

Table 5: Points to be awarded under the assessment criteria of this Standard

Label	Evaluation Criteria		Points		Related BEAM Plus Credits
			Basic	+Bonus	
	Product Information [CORE]		5	-	
Carbon	CFP Quantification		-	+10	
Resource	Circularity	Recyclability	-	+5	
		Packaging Requirement	-	+5	
		Design for Disassembly	-	+5	
	Waste Management	Waste Management Plan	-	+5	
	Water Management	Water Consumption Reporting		+5/+10	
		Water Recycling Program			
		Water Management System			
	Energy Management	Energy Management Plan	-	+5/+10	
		Energy Management System			
Environment	Environmental Management	Environmental Management System	-	+5	
	Regional Product	Regional Manufactured Equipment	-	+5	
	Human Toxicity and Ecosystem Impact	Hazardous Substances	-	+5/+10	
		Noise Level [CORE]	15	+10	
Performance	Efficiency Metrics	Motor Efficiency [CORE]	15	+10	EU 2 / EU 3
	System Performance and Reliability	Guarantee Point Acceptance Grades [CORE]	15	-	
	Product Life	Mechanical Seal	-	+5	
InnoSmart	Innovations & Additions		-	+5	IA
		Total:	**50**	**+100**	

Related BEAM Plus Credits refer to these relevant credits under BEAM Plus New Buildings Version 2.0, as listed below:

- EU 2: Reduction of CO_2 Emissions
- EU 3: Peak Electricity Demand Reduction
- MW 9: Use of Green Products
- Innovations and Additions

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