



Confederation of Indian Industry
125 Years: 1895-2020



GreenPro Ecolabelling Assessment Report

Daiki Axis India Pvt. Ltd
(Johkasou Packaged Sewage Treatment System)

September 2020

GreenPro Certification Assessment Report

*Company Name: **Daiki Axis India Pvt. Ltd***

*Products applied for certification: **Johkasou Packaged Sewage Treatment System***

*Review date: **01/09/2020***

Purpose

The assessment docket submitted by 'Daiki Axis India Pvt Ltd' for GreenPro Ecolabelling of their 'Johkasou Packaged Sewage Treatment System' was evaluated in accordance to the requirements of GreenPro Ecolabel for 'Waste Water Treatment System' category

GreenPro Evaluation Methodology

The product was assessed based on the following parameters:

- Product Description
- Product Application
- Product Performance
- Product Stewardship
- Benefits to Green Built Environment
- Case Study

The evaluation has been carried out based on the details collected from products manufacturer, virtual assessment with end user where the products are installed and the feedback from their customers.

Eligibility

'Johkasou Packaged Sewage Treatment System' manufactured by Daiki Axis India Pvt. Ltd qualifies for GreenPro Ecolabel – Green Product Certification.

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Executive Summary

Daiki Axis India Pvt. Ltd has applied for GreenPro Ecolabel – Green Product Certification for their ‘Johkasou Packaged Sewage Treatment System’ manufactured in Vapi, Gujarat. It is a biological type waste water treatment system for treating sewage and grey water from built environment. CII appreciates the vision of leadership in enhancing the ‘Green’ performance of their product.

Johkasou Packaged Sewage Treatment System can be installed in all built environment to treat sewage and grey water. This system is capable to produce odorless and clear treated waste water from sewage and grey water. The quality of treated waste water from Johkasou Packaged Sewage Treatment System is meeting the standard for discharging environmental pollutants into inland surface water.

The performance claims such as effluent quality and treatment cost were evaluated based on test reports shared, operating details gathered from site and user feedback. The summary of test results on treated water quality for Johkasou Packaged Sewage Treatment System are as below,

S. No	Parameters	Unit	Delhi		Bangalore	
			In	Out	In	Out
1	pH	-	7.51	8.19	6.35	6.36
2	BOD	mg/l	174	6	372	5
3	COD	mg/l	496	16	1280	32
4	Suspended Solids	mg/l	1244	3	220	26
5	Oil & Grease	mg/l	5	Nil	20	BLQ
6	Specific Energy Consumption	kWh/KLD	0.5		0.6	

Based on operating parameters of Johkasou Packaged Sewage Treatment System installed at Delhi, Nagpur and Bangalore, the economics of treatment cost for Johkasou Packaged Sewage Treatment System is estimated to be less than **Rs. 25** for treating 1 KL of waste water (sewage / grey).

CII Green Products and Services Council appreciates ‘Daiki Axis India Pvt. Ltd’ for their efforts towards developing an efficient waste water treatment system for enhancing water management.

Based on the documents shared and the virtual assessment with end user, the Johkasou Packaged Sewage Treatment System manufactured by Daiki Axis India Pvt Ltd meets the requirements of GreenPro Ecolabel.

CII Green Products and Services Council is glad to award ‘GreenPro Ecolabel’ for Johkasou Packaged Sewage Treatment System manufactured by Daiki Axis India Pvt Ltd.

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1. PRODUCT DESCRIPTION

Johkasou Packaged Sewage Treatment System is a compact biological waste water treatment system to treat sewage and grey water from built environment. It consists of five chamber as below,

- Sedimentation and separation chamber
- Anaerobic contact media chamber
- Moving Bed Chamber (Aerobic)
- Sedimentation Chamber
- Disinfectant Chamber

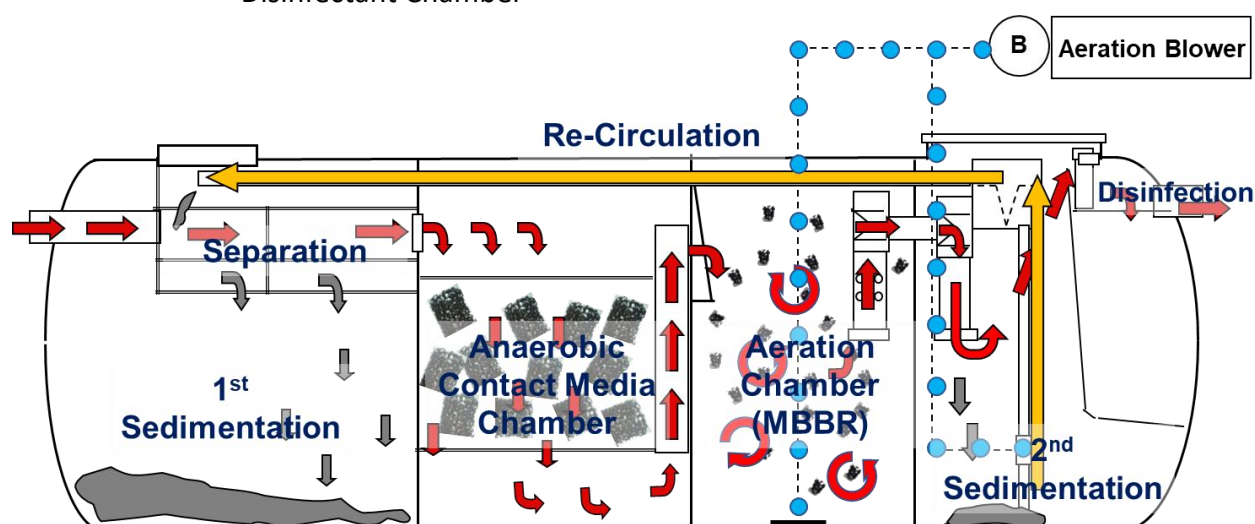
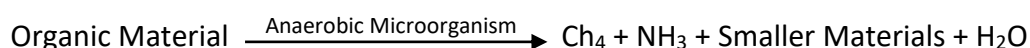


Figure 1: Johkasou Packaged Sewage Treatment System

Working Principle

In sedimentation and separation chamber, the separation of suspended solids from waste water is taking place by gravity. It also act as reservoir to collect domestic waste water. The collected waste water is flows into anaerobic contact media chamber without any external aid. The anaerobic media chamber contains microorganisms that decomposes organic materials present in the waste water. The following reaction is taking place while decomposing organic materials,



Anaerobic microorganism helps in converting nitrite and nitrate in the circulated water into N_2 gas by denitrification. After anaerobic treatment, the water is flowing into moving bed chamber where organic material further decomposed by aerobic microorganisms.

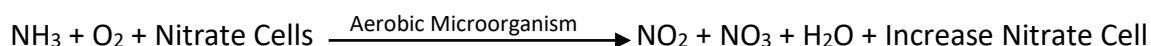
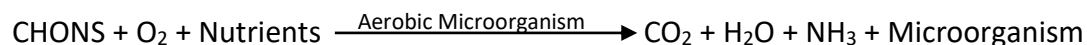
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Upon treating the waste water aerobically, the old microorganism is deployed to develop new microorganism. The following reaction is taking place while decomposing organic materials at moving bed reactor,



Aerobic process also generates significant sludge which is settled down in sedimentation chamber and concurrently, the settled sludge along with NO_2 and NO_3 are transferred to sedimentation and separation chamber by air lift pump.

Eventually, the treated waste water is sterilized at disinfection chamber and discharged into storage tank. With no moving mechanical parts inside the treatment system except air lift pump, the operation and maintenance of Johkasou Packaged Sewage Treatment System is simple and do not require any human interventions. The cost of waste water treatment is low as blower only requires electricity.

Johkasou packaged sewage treatment system has a blower that supplied pressurised air to both moving bed chamber (aeration) and air lift pump. This makes Johkasou packaged sewage treatment system as an energy efficient system. Johkasou packaged sewage treatment system is customized products in terms of waste water treatment capacity. The capacity is ranging from 1 KLD to 50 KLD.

2. PRODUCT APPLICATION

Johkasou packaged sewage treatment system can be installed in all built environment including factory, school, home, hotel, commercial buildings, airport, park, labour camp, etc., where the waste water (sewage) to be treated and make fit for discharging to soil / municipal drain or using for non-potable water application such as gardening, flushing, vehicle washing, cooling tower make up, industrial process, etc.

Johkasou packaged sewage treatment system is not advised to use for treating industrial waste water (effluent from manufacturing process). This system is capable to produce odorless and clear treated waste water from sewage and grey water. The potable water demand of green built environment including residential, commercial and factory buildings can be reduced by utilizing treated waste water for gardening and flushing applications. This system can be used for new construction or retrofitting projects.

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3. PRODUCT PERFORMANCE

In order to assess performance of Johkasou packaged sewage treatment system, the following parameters related to waste water quality were considered. The performance parameters are as below,

- pH
- BOD at 27°C for 3 Days
- COD
- Suspended Solids
- Oil & Grease

The design performance parameters of Johkasou packaged sewage treatment system are as below,

S. No	Parameters	Unit	Inlet	Outlet		
				AI	AIJ	AIM
1	pH	-	6 – 8.5	6 – 8.5	6 – 8.5	6 – 8.5
2	BOD	mg/l	< 300	20	10	5
3	COD	mg/l	< 450	50	25	10
4	Total Suspended Solids	mg/l	< 200	30	20	5
5	Oil & Grease	mg/l	< 10	10	10	10

General standard for discharge of environmental pollutants by Central Pollution Control Board (CPCB) is considered as baseline to assess performance of waste water treatment system. The threshold of performance parameters are given below,

- pH : 5.5 – 9
- COD : 250 mg/l
- BOD : 30 mg/l
- TSS : 100 mg/l

The quality of effluent (treated waste water) from Johkasou Packaged Sewage Treatment System is meeting the standard for discharging environmental pollutants into inland surface water. It was informed by the manufacturer that the cost for treating 1 KL of sewage / grey water is **less than Rs. 25**.

4. PRODUCT STEWARDSHIP

Daiki Axis India has been organizing various stakeholder education and awareness programs on waste water treatment system to promote water management in all built environments and institutional premises. These education and awareness programs have covered stakeholders from

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government officials, policy makers, private sector clients, end users, technical experts and sales partners.

5. BENEFITS TO GREEN BUILT ENVIRONMENT

Johkasou packaged sewage treatment system is contributing significantly to water management in green built environment by offering opportunities for waste water recycling. The potable water required for flushing and irrigating green areas at site can be reduced by using treated waste water from Johkasou packaged sewage treatment system. Also, it helps the building / facility in achieving zero liquid discharge status. Johkasou packaged sewage treatment system is affordable and energy efficient technology with lower operating cost. Benefits of Johkasou packaged sewage treatment system to Green Built Environment are detailed below,

- Contribute to water management in buildings and institutional premises and reduces dependency of fresh water source by treating and recycling of waste water
- Helps in achieving statutory compliance of Green Building regulations and pollution control board
- Reduces cost of waste water treatment and carbon footprint associated with it
- No chemicals required for treating waste water as it is a biological process based on microorganism
- Product has high durability
- Very low life cycle cost
- Hassle free operation and maintenance

6. CASE STUDY

Daiki Axis India Pvt Ltd has installed many Johkasou packaged sewage treatment system in India. They have shared operating details of three sites from Delhi, Nagpur and Bangalore. During virtual assessment with end user in Bangalore, it was observed that waste water treatment system was performing well with limited maintenance at regular interval. The end user of Johkasou packaged sewage treatment system is quite satisfied with performance as well operation and maintenance aspects. It was informed by the end user that operation and maintenance are hassle free and human intervention is very meagre for operating the system throughout the year.

Daiki Axis India has been providing comprehensive support during installation and post installation of waste water treatment system. As part of annual maintenance contract, Daiki Axis India and the end user have been monitoring quality of influent and effluent at regular interval. The performance claims of Johkasou packaged sewage treatment system are evaluated based on test

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reports from third-party laboratory and operating parameters shared by end user. The summary of test results is as below,

S. No	Parameters	Unit	Delhi		Bangalore	
			In	Out	In	Out
1	pH	-	7.51	8.19	6.35	6.36
2	BOD	mg/l	174	6	372	5
3	COD	mg/l	496	16	1280	32
4	Suspended Solids	mg/l	1244	3	220	26
5	Oil & Grease	mg/l	5	Nil	20	BLQ

The economics of treatment cost for Johkasou packaged sewage treatment system is estimated based on operating parameters shared by end user at Delhi as below,

S. No	Parameters	Unit	Delhi	Bangalore
1	System Capacity	KLD	10	8
2	Daily Energy Consumption by Blower	kWh	4.8	4.8
3	Operation & Maintenance Cost	Rs	160	160
4	Quantity of Treated Waste Water	KL	10	8
5	Unit Cost of Electricity	Rs / kWh	8	7.5
6	Treatment Cost	Rs	198.4	196
7	Specific Treatment Cost	Rs / KL	19.4	24.5

It can be noticed that the treatment cost for treating 1 KL of sewage or grey water is ranging from **Rs. 19 to 25** and quality of effluent is well within the limit set by Central Pollution Control Board.

TECHNICAL ADVICE

It is recommended to explore possibilities of substituting chlorine as disinfectant with environment friendly disinfectant. This may further increase environmental preferability of Johkasou packaged sewage treatment system.