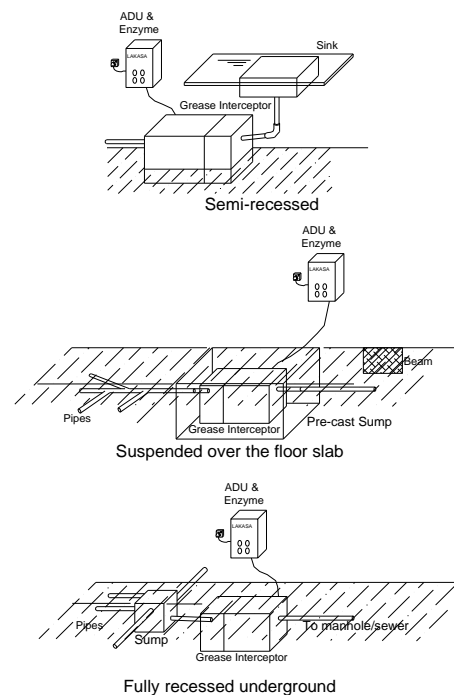


LAKASA Biomatic Grease Interceptor

Need for Good Grease Interceptor System!

Direct discharge of greasy and oily wastewater from restaurants, fast food stores, centralized food courts in commercial and institutional buildings as well as traditional individual shops into the drain lines has significantly increase pollution to server plants, rivers, lakes and other waterways. The increasing difficulties in dealing with these problems are in the form of frequent pipeline and manhole blockages, obnoxious and rancid odors. This calls for a compulsory adoption of effective waste effluent pre-treatment.

LAKASA Biomatic Grease Interceptor is designed to provide an effective, hygienic and environmental friendly solution to grease contamination. LAKASA Biomatic Grease Interceptor is recommended for use in kitchens, restaurants, institutions, and all types of food processing areas, with wastewater containing grease, fats and oil (FOG) and solid starch. LAKASA Biomatic Grease Interceptor is completed with two individual chambers to take care both the solid waste and starch, as well as grease and oil which are frequently exist in kitchen wastewater. The solid waste and starch is filtered out effectively from the sediment trap (first chamber), while the grease and oil is intercepted from the second chamber. The interceptor can be used for manual removal of oil and grease or used in conjunction with LAKASA Biomatic Liquid Enzyme for waste digestion.



Type of Installation

Specification of LAKASA Grease Interceptor

The unit is completed with two chambers and with two separate interceptor covers. The first chamber comes with a 4.0mm dia. 7mm pitch perforated stainless steel bucket and is able to effectively filter away incoming solid waste and starch. The second chamber is completed with a diffusing baffle at the beginning and followed with 3 big and across the interceptor body baffles which can which reinforce the interceptor structure solidity and also effectively control the flow velocity and turbulence of incoming wastewater; the unit also c/w a enzyme dosing connection and deep seal integral trap immediate before the outlet to intercept the grease and oil..

How LAKASA Grease Interceptor Functions

Wastewater from kitchen sink, dishwasher that contains air, grease and food particles are flushed and enters the inlet of interceptor at high velocity. Food particles will be trapped and filtered in the stainless steel perforated basket, leaving only greasy water to continue its journey to the next chamber. At the inlet to second chamber, wastewater is immediately directed downward by the main deflecting baffles, at the same time allowing trapped air bubbles to rise to the surface. The baffles will effectively reduce the velocity and turbulence of the incoming liquid. The turbulence of the liquid flow is further reduced when the wastewater passes through the remaining baffles. These baffles are arranged in unique positions to allow effective and efficient separation of grease, fats, and oils from wastewater and rise above the normal established water line of the interceptor.

Sizing & Selection

- (i) Check the flowrate of wastewater from each fixture.
- (ii) Calculate total flowrate from all the fixtures connected to one particular grease interceptor.
- (iii) Identify and assume the simultaneous discharge diversity factor for all the fixtures.
- (iv) Refer to the table for sizes available and select proper interceptor of equivalent or next higher rate.

Selection Tables: Fixture Size**Sinks:**

Sink Size Interior Measurements	# Bowls	Capacity in Gallons	Water Flowrate GPM
12" x 18" x 6"	1	4.2	7
14" x 16" x 8"	1	5.8	7
18" x 20" x 8"	1	9.4	10
16" x 18" x 8"	2	15.0	15
18" x 20" x 8"	2	18.7	20
20" x 30" x 8"	1	15.5	20
20" x 24" x 12"	1	18.7	20
20" x 22" x 8"	2	23.0	25
20" x 22" x 12"	2	34.0	35
24" x 24" x 12"	2	44.9	50

Dishwashers:

Capacity In Gallons	Size GPM
15-20	15
20-30	20
30-50	25
50-70	35
70-100	100

EXAMPLE OF CALCULATION

Fixtures	No. of fixtures	Fixture value (GPM)	Total value (GPM)	Diversity factor	Flow rating (GPM)
Floor drains	2	12	24		
Double bowl sink (18"x20"x8")	2	20	40		
Hand washing sink (14"x16"x8")	2	10	20		
Dishwasher (50 gallon capacity)	1	35	35		
		Total	119	75%	89 GPM

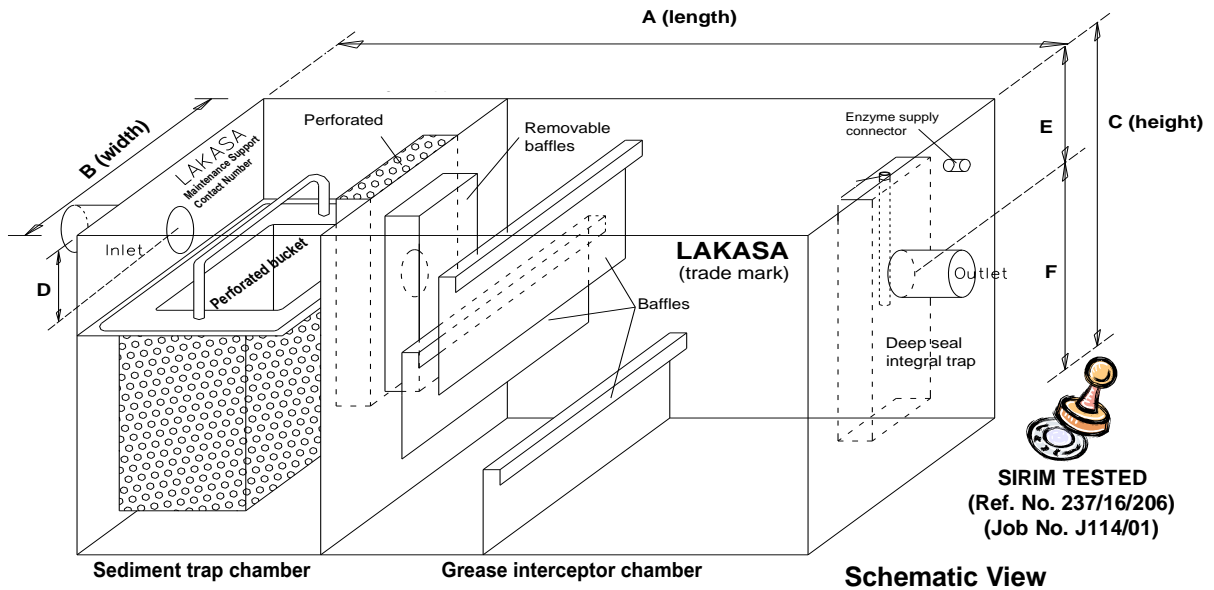
- *Diversity factor only applicable to Low activity (cooking and washing) environment.*
- *Water Retention Time of more than 30 minutes will generally achieve >99.9% of Grease removal percentage.*

The model recommended is LK2100 (100 GPM) OR **LK2200 (200 GPM) for busy environment.**

Operation and Maintenance Guide

1. Sediment trap chamber is to be cleaned up on **daily basis**. However, the frequency of cleaning can be once a few days if the incoming volume is low.
2. Grease trap chamber is designed to intercept incoming grease and oil. The grease and oil which is trapped in this chamber can be cleaned either
 - by manual scoop (once a week). In this case, Grease Interceptor shall be maintained in efficient operating condition by periodic removal of the accumulated grease. No such collected grease shall be introduced into any drainage piping, or public or private sewer.
 - OR
 - by biomatic liquid enzyme, which actually converts grease into water and carbon dioxide. ***If a thickening of the contents is noted, with a distinct caking effect across the surface, or an offensive, pungent odour is emitted, then gradually increase the suggested dosage rate to compensate.***
 - ***If the contents appear to remain in a minimal semi-liquid state with little or no odour, this indicates successful degradation of the grease. Whenever tank is cleaned, the initial dosing procedure must be repeated.***
3. With the introduction of biomatic enzyme, periodic cleaning for grease is about once every 3 months. For manual cleaning (without using biomatic enzyme), cleaning for grease is about once a week. However, more frequent cleaning is required when there are more activities and/or when incoming grease content is high.
4. Additional aeration system is suggested for larger size grease interceptor. The aeration pump is pre-set to run at the right timing and duration to achieve optimum performance.

LAKASA Biomatic Grease Interceptor
Use in restaurant, food court, cafeteria, school canteen, etc.



ONE YEAR WARRANTY ON WELDING JOINTS (LEAKAGE) FOR LAKASA GREASE INTERCEPTOR

Interceptor Material:

- Stainless Steel **304** or **316** : Interceptor body, Perforated bucket, baffles, integral trap, inlet & outlet pipe sleeve.
- Stainless Steel **304** or **316** : Interceptor Cover.

Advantages:

- Complete with sediment interceptor.
- Big baffle design across the interceptor body to avoid blockage by sediment waste.
- Easy opening cover makes cleaning works much easier.

Dimensional Data (All dimension in mm)

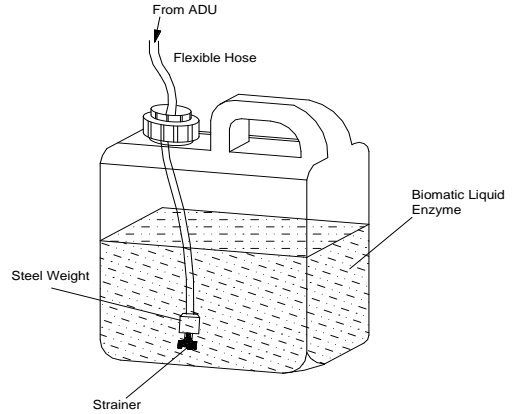
Model	Flowrate (GPM)	Flowrate (liter/sec)	Grease capacity	Inlet & outlet	A (length)	B (width)	C (height)	D	E	F	Weight *(full)
LK2012S	12	0.91	10 kg	50	630	340	300	80	85	215	65kg
LK2015S	15	1.14	14 kg	50	690	370	320	90	95	225	80kg
LK2020S	20	1.50	18 kg	75	730	400	330	90	95	235	100kg
LK2025	25	1.89	23 kg	75	780	360	420	100	110	310	135kg
LK2035	35	2.65	32 kg	100	820	440	430	100	110	320	160kg
LK2050	50	3.78	46 kg	100	920	490	500	110	130	370	200kg
LK2075	75	5.68	68 kg	100	1220	580	530	110	130	400	350kg
LK2100	100	7.57	91 kg	100	1220	720	740	150	180	560	700kg
LK2150	150	11.35	136 kg	100	1700	760	810	150	180	630	1000kg
LK2200	200	15.14	182 kg	150	1820	860	910	180	210	700	1200kg
LK2250	250	18.92	227 kg	150	1960	940	1010	180	210	800	1800kg
LK2300	300	22.70	273 kg	150	2200	980	1110	180	210	900	2000kg
LK2350	350	26.49	318 kg	150	2350	1070	1140	180	210	930	2400kg
LK2400	400	30.28	363 kg	150	2440	1180	1140	180	210	930	2700kg
LK2450	450	34.05	409 kg	150	2740	1140	1220	180	210	1010	3200kg
LK2500	500	37.84	454 kg	150	3000	1220	1220	180	210	1010	3800kg
LK2600	600	45.41	545 kg	200	3000	1220	1500	210	250	1250	4000kg
LK2700	700	52.98	635 kg	200	3000	1390	1500	210	250	1250	5500kg
LK2800	800	60.55	726 kg	200	3000	1500	1500	210	250	1250	6300kg
LK2900	900	68.12	817 kg	200	3000	1500	1750	210	250	1500	7000kg
LK21000	1,000	75.69	908 kg	200	3000	1500	1900	210	250	1650	7800kg

* Full weight means when full with water & solid waste

Sole Agent : LAKASA Marketing & Distribution Tel: 03-6120 6895 Fax: 03-6120 1852

LAKASA Biomatic Liquid Enzyme

LAKASA Biomatic Liquid Enzyme is a blend of highly specialized microorganisms (multiple strain) designed specifically to promote rapid degradation of excessive, difficult to digest organic waste. These organic wastes include grease, fats and oils (FOG), detergents, starches, protein, cellulose and hydrocarbons. With the introduction of LAKASA Biomatic Liquid Enzyme, FOG is converted into harmless compounds of CO₂ (carbon dioxide) and H₂O (water). It is an effective pre-treatment for organic waste to prevent it from passing over to the municipal wastewater system.



Characteristic of LAKASA Biomatic Enzyme Concentrate

LAKASA Biomatic Enzyme is designed for use to enhance the decomposition (degradation) of organic waste compounds in food processing wastewater treatment.

Microorganisms Strains:

Bacillus subtilis (3 strains) Bacillus Licheniformis
 Bacillus Megaterium
 Bacillus Polymyxa

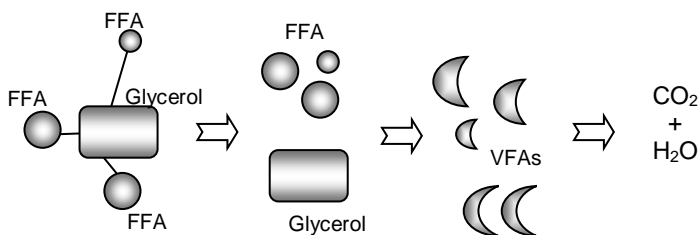
Bacterial Cultures:

Bacillus subtilis (3 strains)	Superior producer of protease, amylase, cellulase and lipase enzyme activity
Bacillus Licheniformis	Excellent producer of protease and amylase activity and requires facultative condition for growth
Bacillus Megaterium	Excellent producer of protease, lipase and cellulase activity and requires facultative condition for growth
Bacillus Polymyxa	Excellent producer of lipase activity and requires facultative condition for growth
Enzymes	Protease, Amylase, cellulase, Pectinase, Beta glucanase, xylanase and lipase
Other Ingredients	Essential nutrient and amino acid complexes

Benefits

- (i) Effectively and rapidly reduce/eliminate BOD and COD in wastewater.
- (ii) Decomposes and permanently converts organic wastes into water soluble compounds.
- (iii) Keeps drain lines flowing smoothly; reduces the amount of pumpouts.
- (iv) Non-corrosive: will not damage drain lines & grease interceptor
- (v) Controls and reduces odors
- (vi) Contains no polluting phosphates
- (vii) Non-toxic, Non-pathogenic (non-disease causing)
- (viii) Environmentally safe & friendly

Biodegradation Process Summary



1. Selected microbes produce enzyme
2. Enzymes liquefy organic waste
3. Microbes digest liquefied organic waste
4. After digesting liquefied waste, microbes give off harmless carbon dioxide (CO₂) and water (H₂O) byproducts
5. Microbes multiply and continue this process until all organic waste is eliminated

Why Biomatic Enzyme is NOT working in some cases

- I. Inadequate dosage.
- II. Inappropriate dosing time – the water temperature might be too high or the enzyme might have been flushed out before it has enough time to react.
- III. The grease content might be too high for biological process. In this case, manual cleaning is required once a month or more frequent if needed.
- IV. Inadequate oxygen for microbe to perform, additional aeration might be required, especially for large interceptor.
- V. Wastewater might be too acidic or contains high chlorine mixture which can kill microbes.

Enzyme Dosage

(Actual dosage required might vary according to grease content)

Model	Daily meals	Starter dose (ml)	Monthly dose (litres)	
			LOW grease	HIGH grease
LK2012S	up to 80	90	0.6	1.8
LK2015S	80 – 150	90	0.6	1.8
LK2020S	150 – 250	180	1.0	2.7
LK2025	250 – 300	180	1.0	2.7
LK2035	300 – 400	270	1.5	3.6
LK2050	400 – 600	360	1.8	4.5
LK2075	600 – 1000	450	2.0	5.4
LK2100	1000 – 1500	540	2.0	5.4
LK2150	1500 – 2000	630	3.0	9.0
LK2200	2000 - 2500	700	3.6	10.8
LK2250	2500 – 3000	800	4.0	12.0
LK2300	3000 – 3500	900	4.5	13.5
LK2350 to LK2500	3500 - 5000	1000	5.0	15.0

SIRIM LAB TEST	
Day	Grease & Oil
Day 1	0.5945 g
Day 7	0.2280 g
Day 14	0.1182 g

Conclusion:

The results clearly showed positive impacts of LAKASA BIOMATIC ENZYME in the degradation of FOG.

Wastewater from main kitchen always contain high % of grease, whereas those from hand washing sink / basin and secondary centralized Grease Interceptor usually does not have much grease and oil.

For best performance

1. Follow the initial and daily dosing procedures.
2. Optimum dosing time is 1 hour after kitchen closes.
3. Do not discharge very hot water into the interceptor immediately before or immediately after dosing.
4. Do not discharge chlorine, strong caustics, concentrated disinfectants, bleach or sanitizers into the interceptor.
5. Do not deliberately discharge cooking oil or grease into the interceptor

Characteristics

Appearance	: Liquid
Odour	: Pleasantly perfumed
pH	: 8.2 – 8.8
Effective pH range	: 5.5 – 9.0
Effective temperature	: 5 – 50°C
Stability	: 2 years

During the first few weeks of dosing operation, regular inspection of the internal condition of the interceptor should be conducted to gauge the performance of the dosage. If a thickening of the contents is noted, with a distinct caking effect across the surface, or an offensive, pungent odour is emitted, then gradually increase the suggested dosage rate to compensate. If the contents appear to remain in a minimal semi-liquid state with little or no odour, this indicates successful degradation of the grease. Whenever tank is cleaned, the initial dosing procedure must be repeated.

Health & Safety

The Lakasa biomatic liquid enzyme concentrate is safe in normal use. The biologically active nature of the product may cause skin irritation in some cases. It is essential that rubber gloves are worn at all times.

Skin contact Should the concentrate come in contact with skin, wash with plenty of clean water.

Eye contact If the concentrate splashes into the eyes or is rubbed in by hand, flush eyes with plenty of clean running water.

Ingestion Avoid ingesting the concentrate but should an accident occur, wash mouth thoroughly with water. Do not induce vomiting. Drink plenty of water or milk. Seek medical advice immediately after the initial treatment has been given.

This product should be stored, handled and used in accordance with good industrial hygiene practices. The information contained herein is based on the present state of our knowledge and is intended to describe all products from the point of view of health and safety requirements. It should not therefore be construed as guaranteeing specific properties.

LAKASA Auto-Dosing Unit (ADU)

LAKASA Auto-Dosing Unit (ADU) is highly recommended to install in conjunction with grease interceptor. It will ensure the dosing of biomatic liquid enzyme at regular intervals consistently. It enhances the efficiency of the operation and significantly reducing the build-up of grease and frequency of cleaning.

There is a digital timer to control setting for the **dosage** and **timing** of dosing the biomatic enzyme. The reliability and accuracy for the timing and dosage setting is important and critical, because this will ensure the optimum performance of the enzyme and to avoid the wastage of enzyme

There is a Back-up battery for the setting in case of power failure. The setting of the programs will still be valid and when the power supply is resumed. The auto-dosing system will continue to run as normal and do not have to re-set again.



Specification of LAKASA Auto-Dosing Unit

The unit is a temporized dosing system, activated by a **programmable digital timer**. It comprises and completed with

- PVC Enclosure Box, size 8"x6"x3" (IP 66)
- Peristaltic Dosing Pump
- Digital Timer with Litium Battery backup to 3 years memory / program without power connection. No usage of Litium Battery when there is power supply.
- 1.2 meter electric cable wiring
- 3.0 meter length (6mm OD, 4mm ID) flexible silicone enzyme supply hose,
- 400mm length (6mm OD, 4mm ID) flexible silicone sucking hose
- Anti-float weight (stainless steel 304), which prevent hose from floating on the liquid surface, ensuring proper sucking
- 3 pin plug,



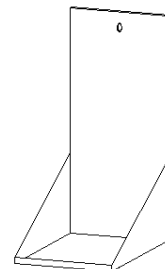
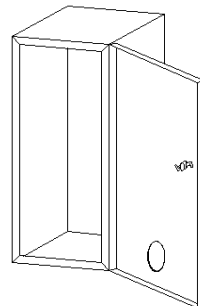
Technical Parameter of Perilstatic Dosing Pump

Motor Type	220V Synchronous Motor
Power	18 Watt
Rated Voltage / Current	220V / 0.08A
Control Method	Switch Control
Weight	Approx 803g
Noise	<65dB
Motor Life Span	800 operating hours
Perilstatic Tube Material	BPT Pump Tube
Perilstatic Tube Life Span	1,000 operating hours
Perilstatic Tube Diameter	6.4mm OD, 3.2mm ID
Flow Rate	68 ml / minute
Note : BPT Pump Tube resistance to common chemical, acid and alkali, and oxidation resistance	

Material: Stainless Steel 304
Size : 210(W)X580(H)X175mm(D)

Lockable Cabinet

Hanging Panel

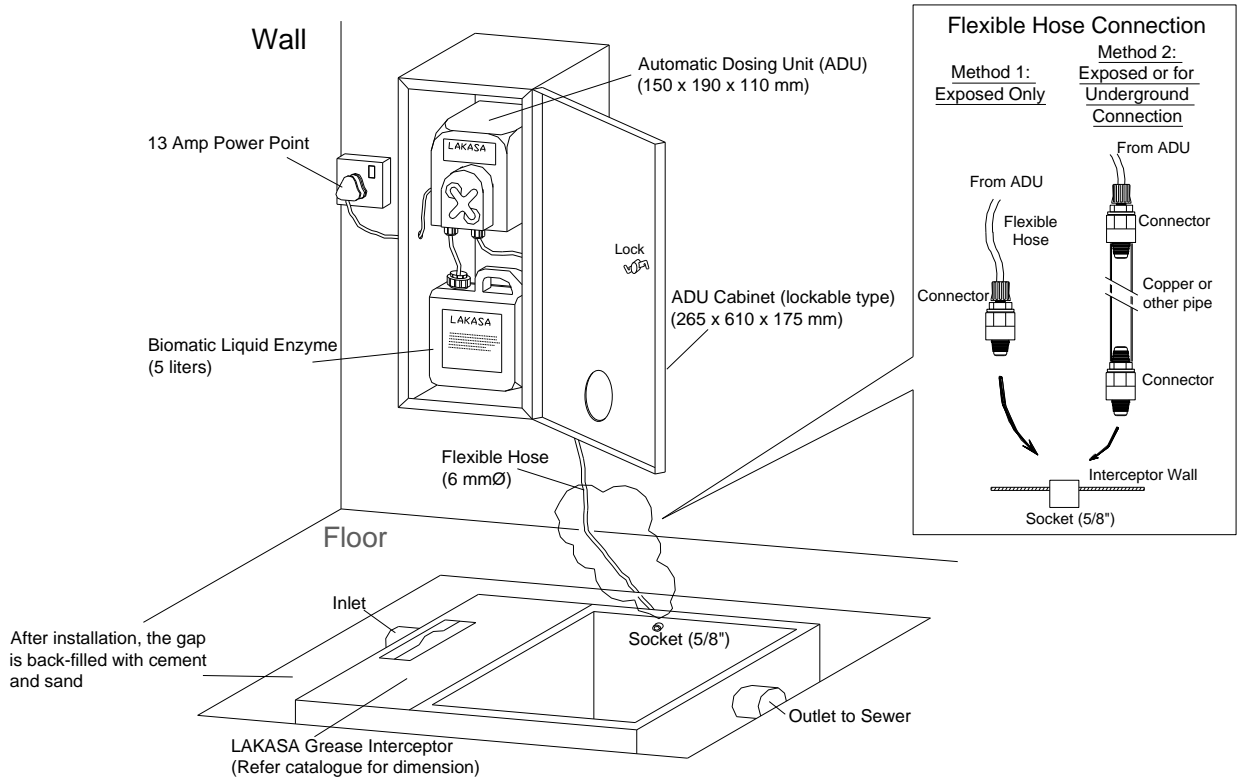


Installation

The LAKASA ADU is recommended to be located in close proximity to the grease interceptor. The recommended distance is not more than 5 meters for effective transmission horizon length and less than 2 meters vertical height above the enzyme source to the destination.

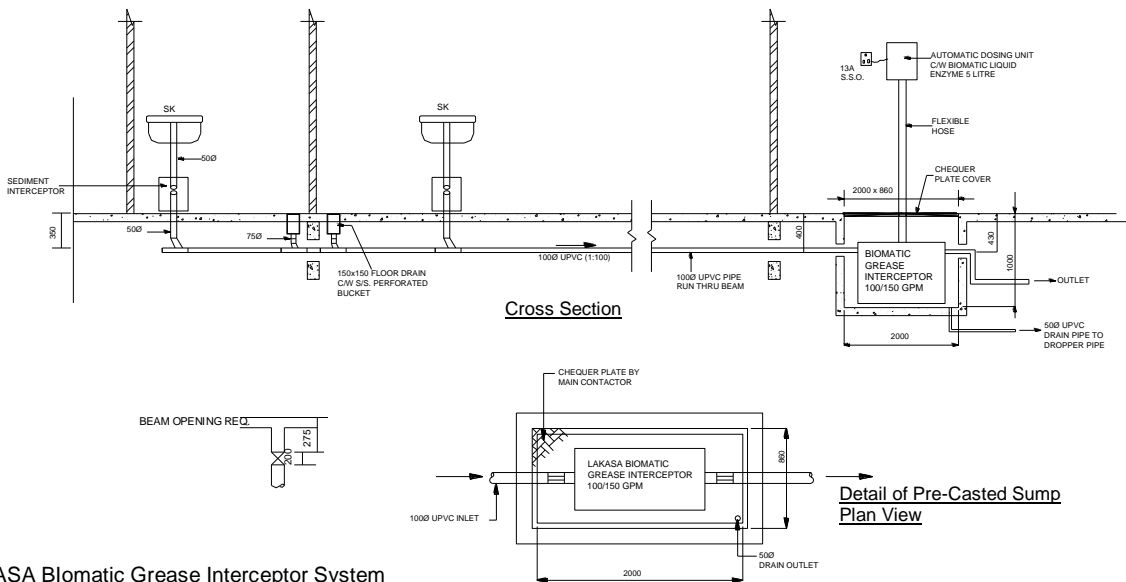
A conduit pipe (>8mm ID) to safeguard the enzyme silicone supply hose (6mm OD) is recommended to link the auto-dosing pump to the grease interceptor.

LAKASA Auto-Dosing Unit (ADU) is installed close proximity to Grease Interceptor

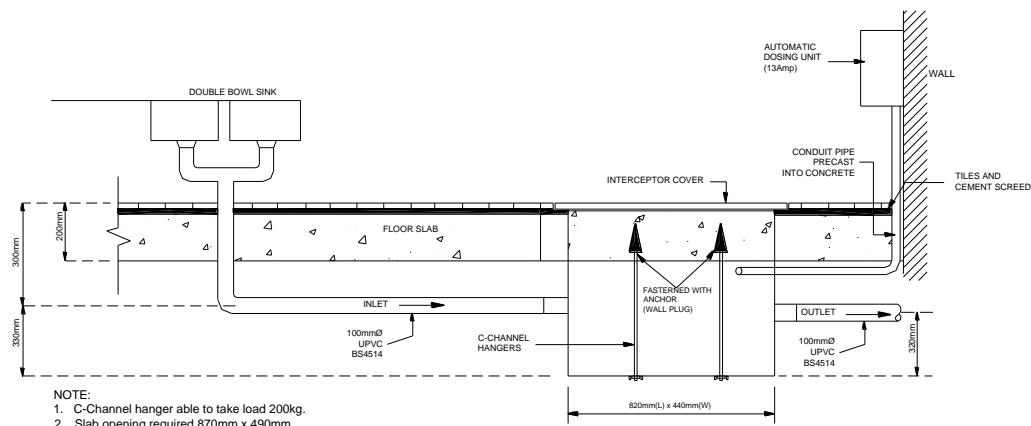


Installation for LAKASA Grease and Sediment Interceptor & Grating Sediment Trap

LAKASA Biomatic Grease Interceptor (Typical Installation: Suspended Type)



LAKASA Biomatic Grease Interceptor System Installation: Suspended with hanger support Model: LK2035 (35 GPM)



Method Statement for Installation of LAKASA Biomatic Grease Interceptor, Auto-Dosing Unit and Biomatic Enzyme

Grease Interceptor

1. Inspect unit for defects or damages and make sure it meets specified requirements (eg : model and size).
2. Inlet & outlet is connected accordingly and properly. **DO NOT INSTALL INTERCEPTOR BACKWARDS.** Place at a firm & balance concrete base. Install interceptor as close as possible to the source of fats, oils and grease (FOG) laden water. This minimizes unprotected pipe, and FOG separates best when effluent is relatively hot.
3. Install interceptor sitting on floor, partially recessed or flush-to-floor, making sure there is enough room to allow for easy maintenance of the unit. (Room for cover to be removed and sediment bucket to be taken out for cleaning).
4. **INTERCEPTOR MUST BE PLACED ON A FLAT, SOLID SURFACE TO SUPPORT THE BOTTOM!** When suspending interceptor from floor above, all units must be fully supported on bottom with a flat surface strong enough to support the weight of the unit when full of water/FOG. All units must be independently supported to avoid stress on fittings.
5. **WHEN INSTALLING IN THE GROUND,** Construct a solid manhole sump for housing the interceptor. Manhole sump cover should normally be higher a bit the floor level **OR** construct a drain surrounding the cover to channel away most rain water and prevent it from entering the sump. The sump should also allocate four corner water exit at lowest possible 4 sides corners for the in case splashed into rain water to escape and seep into the earth outside the sump.
6. **FILL INTERCEPTOR WITH WATER AND INSTALL LID BEFORE BACK FILLING.** It is recommended to use light sand for back fill. Be sure backfill is free of sharp stones and foreign matter to avoid punctures. (**DO NOT PUT SAND IN INTEREPTOR!**)
7. **INTERCEPTOR** filled with clean water until static water level and is ready for operation.

Auto-Dosing Unit (ADU)

1. To mount the ADU to wall with a lockable cabinet.
2. To connect ADU to a 13 Amp power point.
3. To set current time and dosing time (set 1 hour after kitchen close).
4. To set the dosing duration according to recommended dosage. The unit is running at a speed of 7 ml/min.
5. To connect a short flexible hose to enzyme bottle. Use steel weight and strainer provided to ensure the hose reaches the bottom of the bottle.
6. To connect a long hose (with conduit pipe) to the grease interceptor. To use the connector provided to join the connection.
7. To switch to manual dose to ensure pump head is rotating and enzyme is sucked up and delivered to interceptor.
8. To switch to "Auto" and the ADU will run automatically according to the preset time.

Biomatic Enzyme

1. Avoid direct sunlight and should be kept inside the ADU cabinet.
2. When biomatic enzyme level is running low, replenish and top up as soon as possible.