

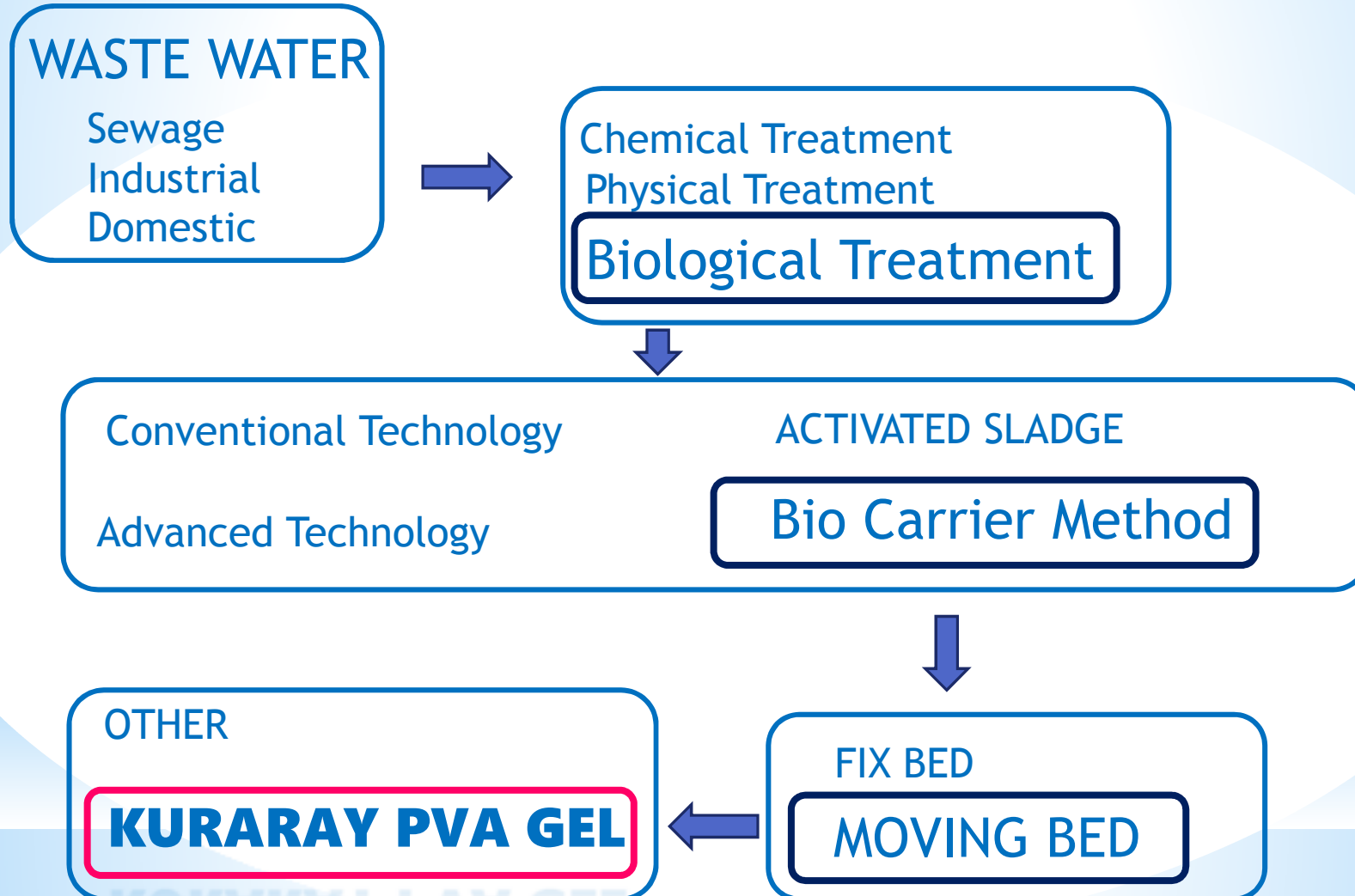
WASTE WATER TREATMET TECHNOLOGY

BIO CARRIER FOR MBBR

[PVA GEL]



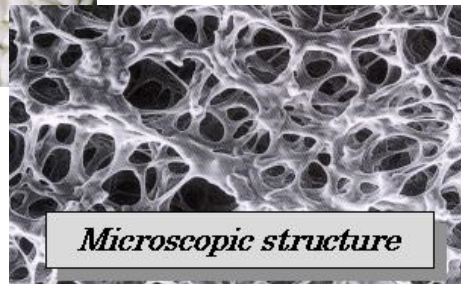
WASTE WATER TREATMENT ?



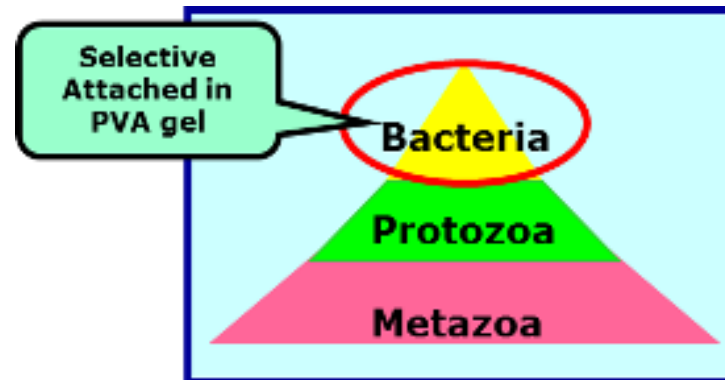
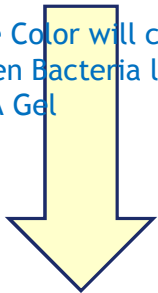
PVA-gel beads structure



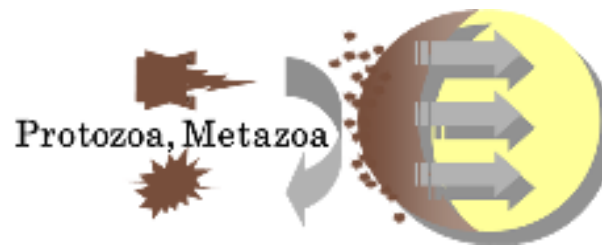
Material: Polyvinyl Alcohol (PVA)
 Size: 4-5 mm ϕ beads
 Specific gravity: 1.015



The Color will change
 when Bacteria live in
 PVA Gel

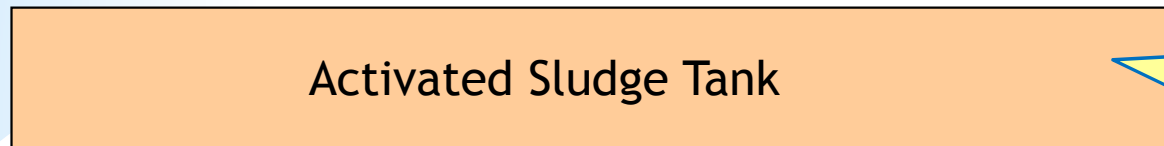


Only Bacteria is effective for wastewater treatment



Wastewater Treatment With Kuraray PVA-gel Beads

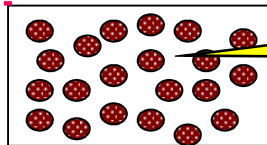
Conventional Activated Sludge Method



Mixture of bacteria, protozoa, metazoa, etc

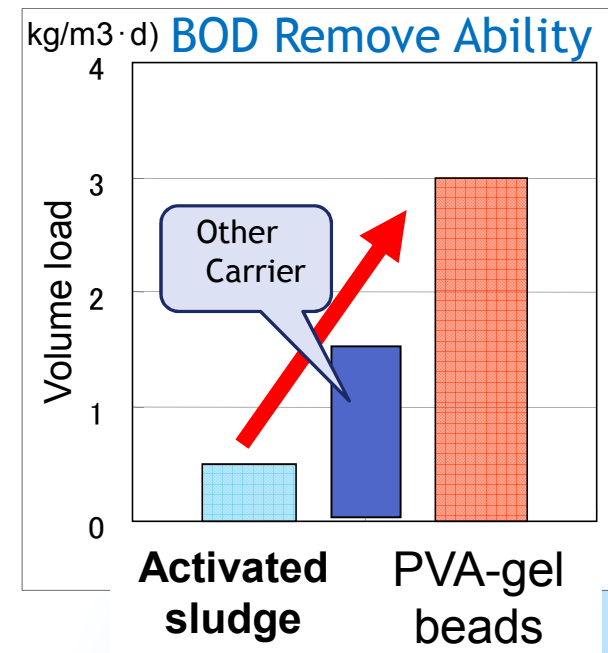
Tank volume reduced

PVA GEL Method



Only effective bacteria retained

Packing Ratio :10% / Tank volume



ADVANTAGE OF PVA GEL

1. High efficiency

Treatment capability using PVA gel can be enhanced about **5 times over** that of activated sludge, thus allowing for upgrading of existing systems or for design of new processes with greatly reduced footprints.

2. Nitrogen removal

PVA gel can also be used for nitrification and denitrification with conversion rates **3 times greater** (or more) than activated sludge.

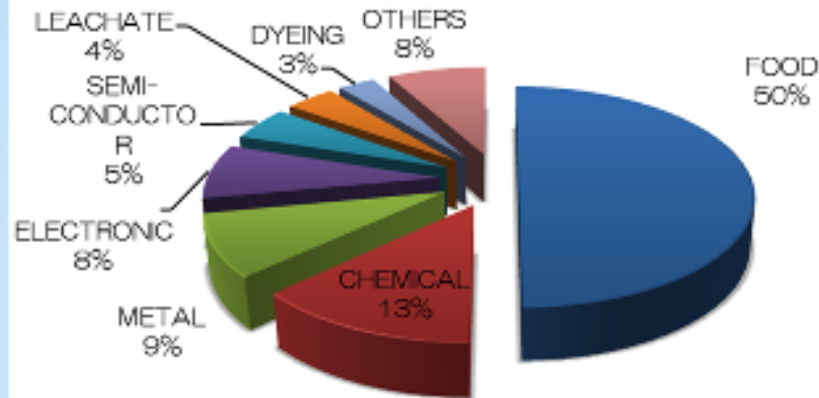
Also can use against Nitrogen (Ammonia) from River /Lake / Grand water

3. Excess Sludge Reduction

PVA Gel can contribute the reduction of excess sludge

Comparison Table	PVA GEL	Conventional
BOD	2.5~5.0 kgBOD/m ³ /D	0.5 kgBOD/m ³ /D
Nitrification	0.3~0.6 kgNH ₄ N/m ³ /D	0.1 kgNH ₄ N/m ³ /D
Denitrification	1.0~3.0 kgNO _x N/m ³ /D	0.3 kgNO _x N/m ³ /D

Project reference is over 300



Reference Overseas Business (Over 10m3)

Country	Industry	Purpose	YY/MM	Quantity (M3)
China	Microelectro	COD	2006.03	323.00
Thailand	Chemical	COD	2007.03	68.00
Korea	Pulp & Paper	COD	2008.05	38.00
Taiwan	Microelectro		2010.09	42.50
China	Food		2011.12	18.50
Singapore	CETP	COD	2012.04	170.80
Croatia	Sewage		2012.10	52.00
Thailand	Chemical	COD	2013.04	175.00
India	Sewage		2013.04	3.00
India	Chemical	COD	2013.05	19.00
Slovenia	Sewage		2013.08	20.00
Slovenia	Sewage		2013.08	23.00
Slovenia	Sewage		2013.08	65.00
China	Automobile	Denitrification	2014.03	11.00
Vietnam	Sewage	COD Nitrification	2014.03	24.90
Vietnam	CETP	COD Nitrification	2014.05	328.00
India	Sewage	COD	2014.12	96.00
India	Sewage	COD	2015.03	96.00
Vietnam	Sewage		2015.03	10.00
Bangladesh	Textile	BOD.COD	2015.07	65.00
Mexico	Sewage		2015.10	16.00
India	Paint	BOD.COD	2015.12	129.00
Bangladesh	Textile	BOD.COD	2015.12	54.00
Vietnam	CETP	COD	2015.12	257.00
Taiwan	Semiconduct		2016.01	40.00
China	Solar panel	Denitrification	2016.01	50.00
Bangladesh	Textile	BOD.COD	2016.06	14.00
Bangladesh	Textile	BOD.COD	2016.08	48.00
Vietnam	CETP	COD Nitrification	2016.10	106.70

Country	Industry	Purpose	YY/MM	Quantity (M3)
Bangladesh	Textile	BOD.COD	2016.11	36.00
Vietnam	Sewage	COD Nitrification	2016.12	21.20
Vietnam	Sewage	COD Nitrification	2016.12	12.10
Vietnam	CETP	COD Nitrification	2016.12	120.00
India	CETP	COD	2017.01	15.00
India	Breweries	BOD	2017.03	12.00
Indonesia	River water	COD.Nitrification	2017.05	26.00
India	STP	BOD.COD	2017.05	10.00
Malaysia	Sewage		2017.06	12.00
Bangladesh	Textile	BOD.COD	2017.11	80.00
Malaysia	Sewage	BOD	2017.12	120.00
China	Pharmaceuti	BOD	2017.12	150.00
India	STP	BOD.COD	2017.12	63.00
India	STP	BOD.COD	2017.12	30.00
China	Metal	Nitrification.Denitrification	2018.01	30.00
Bangladesh	Textile	BOD.COD	2018.02	24.00
Vietnam	Sewage	COD Nitrification	2018.07	36.70
Slovenia	Sewage	BOD. Nitrification.	2018.08	35.00
China	Microelectro	COD	2018.10	42.00
Vietnam	CETP	COD Nitrification	2018.10	91.00
Vietnam	Sewage		2018.10	10.00
China	Semiconduct		2018.11	30.00
India	Pharmaceuti		2018.12	17.00
India	CETP	COD	2017.01	15.00
India	Sewage	COD Nitrification.	2018.12	38.00
India	CETP	COD	2018.12	60.00
Indonesia	River water	COD.Nitrification	2019.01	72.00
Indonesia	Dyeing	BOD.COD.Nitrification	2019.01	150.00
Vapi Gujarat	Paint	BOD.COD.Zecrus	2019.03	118.00
Hanoi	CETP	COD Nitrification	2019.03	260.00
Myanmar	Sewage	COD Nitrification	2019.03	13.50