

Structure and Treatment Performance of Johkasou

The structure of johkasou should either be in compliance with the structure designated by the Minister of Land, Infrastructure, Transport and Tourism (known as standard structure type), or a structure certified by this Minister (known as certified structure type).

The structure and the volume for each unit equipment of standard structure types were firstly established in 1969 as a nationwide standard in a notice issued by the then Ministry of Construction. It was subsequently revised several times; a recent edition being called 'Structural Methods Stipulated by the Minister of Construction' was made on July 2000. Structural specifications for tandoku-shori johkasou for individual households were deleted during the revision. The latest edition revised in 2006 is shown in Table 5.

Although most of the household johkasou that had been installed up until several years ago were the standard structure types, the certified structure types became popular having a share over 90 percent due to the rapid development of johkasou technology.

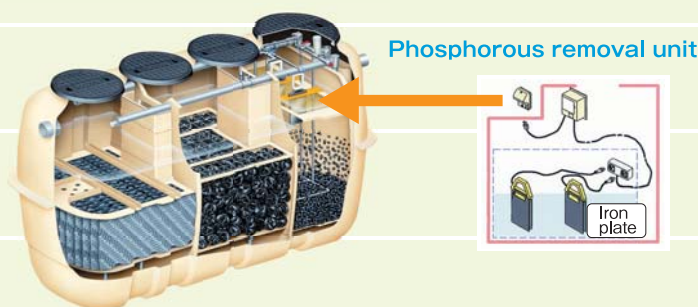
Johkasou can be classified into three types depending on its treatment performance.

- BOD removal types (Effluent BOD ≤ 20mg/l)
- Nitrogen or/and phosphorous removal types (Effluent BOD ≤ 20mg/l, T-N ≤ 20mg/l, T-P ≤ 1mg/l)
- Membrane johkasou (Effluent BOD ≤ 5mg/l)

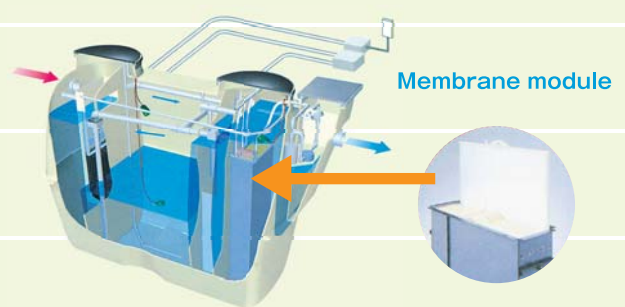
Table 5 Outline of Structural Standards for Johkasou

Class	Type of treatment	Treatment process	Number of users for design					BOD removal rate	Treatment performance			
			5	50	100	200	500		2000	5000	Effluent quality (mg/l)	
								BOD	COD	T-N	T-P	
1	Combined domestic wastewater treatment	Separation-contact aeration process	[Bar chart: 5-5000]					90% or more	20 or less	—	—	—
		Anaerobic filter-contact aeration process	[Bar chart: 5-5000]									
		Denitrification type anaerobic filter-contact aeration process	[Bar chart: 5-5000]									
4	Flush toilet wastewater treatment	Septic tank process	[Bar chart: 5-500]					55% or more	120 or less	—	—	—
5		Land infiltration process	[Bar chart: 5-500]					SS: 55% or more	SS: 250 or less	—	—	—
6	Combined domestic wastewater treatment	Rotating biological contactor process	[Bar chart: 5-5000]					90% or more	20 or less	30 or less	—	—
		Contact aeration process	[Bar chart: 5-5000]									
		Trickling filter process	[Bar chart: 5-5000]									
		Extended aeration process	[Bar chart: 5-5000]									
		Conventional activated sludge process	[Bar chart: 5-5000]									
7	Combined domestic wastewater treatment	Contact aeration and trickling filter process	[Bar chart: 5-5000]					—	10 or less	15 or less	—	—
		Coagulation separation process	[Bar chart: 5-5000]									
8	Combined domestic wastewater treatment	Contact aeration and activated carbon absorption process	[Bar chart: 5-5000]					—	10 or less	10 or less	—	—
		Coagulation separation and activated carbon absorption process	[Bar chart: 5-5000]									
9	Combined domestic wastewater treatment	Nitrified water recirculation type activated sludge process	[Bar chart: 5-5000]					—	10 or less	15 or less	20 or less	1 or less
		Tertiary treatment type denitrification dephosphorization process	[Bar chart: 5-5000]									
10	Combined domestic wastewater treatment	Nitrified water recirculation type activated sludge process	[Bar chart: 5-5000]					—	10 or less	15 or less	15 or less	1 or less
		Tertiary treatment type denitrification dephosphorization process	[Bar chart: 5-5000]									
11	Combined domestic wastewater treatment	Nitrified water recirculation type activated sludge process	[Bar chart: 5-5000]					—	10 or less	15 or less	10 or less	1 or less
		Tertiary treatment type denitrification dephosphorization process	[Bar chart: 5-5000]									
12	Emission standard under the Water Pollution Control Law	Class: 6-11	COD (mg/l): 60	SS (mg/l): 70	n-Hex (mg/l): 20	pH: 5.8-8.6	Total coliforms (N/ml): 3,000 or less					
		6-11	45	60	20	5.8-8.6	3,000 or less					
		6-11	30	50	20	5.8-8.6	3,000 or less					
		7-11	15	15	20	5.8-8.6	3,000 or less					
		8	10	15	20	5.8-8.6	3,000 or less					

note: Class 2 and Class 3 were deleted in 2006.



A phosphorous removal type small-scale johkasou (FRP-made)



A small-scale membrane johkasou (FRP-made)