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'Sewage treatment through unique technology'

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hnb-scan-1 **About Author :**

H N Bhat is respected widely for his innovations and for his achievements. Through his experience of almost four decades with sewage treatment, he has invented the Combitreat-ISBR sewage treatment technology (Patent Pending). He holds a patent on improved Bio-Tower technology which is another power-saving and high performance technology that he has developed.

Until recently, sewage in India was being treated using techniques such as (1) Activated Sludge Process i.e. ASP (2) Upflow Anaerobic Sludge Blanket i.e. UASB (3) Conventional Sequentional Batch Reactor i.e. SBR (4) Oxidation Ponds. Each of these prevalent techniques has few advantages but more disadvantages. There was a strong need for a technology that is applicable for all scenarios and delivers excellent quality, reliable results. The Answer - Combitreat-ISBR.

Combitreat-ISBR (Patent Pending) is a sewage treatment technology developed by the HNB Engineers. HNB is a company that has been in the field of sewage treatment and reuse for almost 4 decades. Over the years, it has tried to solve India's age-old sanitation problem. They have constructed over 70 Sewage Treatment Plants (STP) for different cities across India. Through their experience, they were able to pin-point the ailments plaguing the sanitation sector. Due to a crippling shortage of electricity in India, sewage is often let off into the river without treatment. Due to shortage of land, especially in urban areas, there is no space for installing sewage treatment plants. Last but not the least, the present STPs are not kept clean, odour free and don't deliver consistently good performance. The prevalent sewage treatment techniques are plagued by atleast one of these problems. The result of this is that the rivers are getting worse everyday. Typically, STPs based on conventional Activated Sludge process use lesser electricity but require larger area. UASB based STPs require large area, don't deliver consistent performance and plant premises can become unhygienic. Oxidation Ponds require such vast masses of land that they are now becoming obsolete. Lastly, Conventional SBR based STPs require less area but consume tremendous electricity.

HNB's Combitreat-ISBR seeks to break through the existing mediocrity in the field of sewage treatment and usher in a paradigm shift. Combitreat provides anaerobic treatment to sewage and reduces the organic load to be handled by further treatment. ISBR provides aerobic treatment and stands for Improved Sequential Batch reactor which means, that it has some improvements over the conventional SBR sewage treatment technology. Combitreat-ISBR requires very less electricity as compared prevalent technologies. Not only does it use less electricity to treat sewage, but it also utilizes its state-of-the-art design to generate electricity through 2 avenues - biogas and hydropower. This is probably the only technology out there that can generate electricity through 2 avenues. Combitreat-ISBR requires minimal land area and can be easily fit into the most difficult and arduous urban locales. The plant premises are very hygienic with multiple layers of security are blended in to achieve fool-proof performance. The plant is suitable for urban, semi urban and even rural areas. Another advantage of this technique is that Combitreat and ISBR can be detached, if required and only ISBR can be installed to produce hydropower. When only ISBR is installed, the pumping requirement for the STP reduces because it is a constant level process and thus large saving in power is achieved. When it comes to outlet parameters, Combitreat-ISBR is the frontrunner. It consistently delivers BOD < 10mg/l, TSS < 10mg/l (Pollution Control Board requires BOD < 20 mg/l, TSS < 20mg/l) and gives high nitrate and phosphorus removal. This level of treatment makes it ideal for countries like India where the future demands sewage reuse.

HNB has commissioned a 30 MLD capacity STP based on Combitreat-ISBR technology, for Pimpri Chinchwad Municipal Corporation at Akurdi. This plant has been working very well for well over 2 years. At this plant, the net effect of power generation and power saving is that the plant can produce upto 70% of its required electricity for aerobic treatment. This high self sufficiency becomes even more important when one considers that the annual expenditure on electricity for sewage treatment plants is in millions every year!

HNB Engineers had been awarded work at Chilla, Delhi for a 9 MGD capacity STP on conventional SBR technology. After commencing the work at Chilla, HNB Engineers Pvt. Ltd. submitted a proposal to Delhi Jal Board (DJB) for upgrading the undertaken conventional SBR into its power saving Combitreat-ISBR technology.

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DJB reviewed the proposal and requested Indian Institute of Technology (IIT) Kanpur; for their expert opinion. IIT Kanpur faculty visited the 30MLD STP at Akurdi and were very impressed with the design and performance of the plant. Knowledgeable representatives from IIT Kanpur were deployed to carry out laboratory tests at the same plant for 2 weeks under the guidance of the faculty at IIT Kanpur. They compared outlet results, electricity consumption and overall performance

of 30 MLD STP on Combitreat-ISBR with a 30 MLD STP on conventional SBR located at Chinchwad, Pune. On the basis of its study and observations, IIT Kanpur submitted a report that recommended the use of Combitreat-ISBR in place of conventional SBR. With this recommendation from IIT Kanpur, DJB accepted the proposal for replacing the conventional SBR based Sewage Treatment Plant of 9 MGD capacity at Chilla with the more advantageous option, Combitreat -ISBR technology.

Delhi is all set to welcome this beautiful and plush new STP at Chilla that would save its residents a few million rupees every year. The STP is expected to be commissioned towards the end of the year 2013. The sewage industry has welcomed this new technology with open arms and hopes that India's rivers would soon run with clean water as they did a century ago.