

The fundamental principles and features of LUMILITE new water treatment technology

1. Fundamental principles

LUMILITE new water treatment technology belongs to an eco-friendly treatment method using the organic combination of both physical and biological treatment-i.e. After initial cohesion and precipitation of water polluting substances, organic matter of the precipitated sediment biodegrades while inorganic element is permanently solidified without causing secondary pollution.

LUMILITE new water treatment technology, as characterized eco-friendly, utilizes various natural porous minerals as main carrier together with positive and negative ion exchange technology so that it does not affect aquatic life and cause any side effects. LUMILITE water treatment agents have excellent quality due to well developed zillions of tiny holes in the minerals as well as strong ion exchange capacity.

LUMILITE water treatment recipe including positive or negative ion exchange technology is precisely prescribed according to the type of polluted water (scale, movement pattern, pollution level) and specific requirements for water treatment, and is put into effect by spraying over the surface of polluted water.

Mechanism of biodegradation of precipitated sediment by LUMILITE technology:

LUMILITE water treatment agents sprayed over water surface purify water by not only adsorbing pollutants and subsequent precipitation but also providing microorganism with the good condition of settlement in the precipitated sediment. i. e. The extremely high porosity LUMILITE agent is just good for the reproduction and growth nest of aerobic microorganism because the oxygen detained in the tiny holes in the agent is critically important to microorganism. This microorganism, capable of eating the organic matter of polluted sediment, constantly reproduces and grows so that it can decompose the organic substances of polluted sediment and purify water at the end. Therefore, if LUMILITE technology is adopted for treatment of polluted sediment, no extra provision of oxygen is needed. These are main features and advantages of LUMILITE water treatment technology.

2. Main technological features

a. Simple and easy management

Without a complicated treatment facility a large scale of water reservoir can be easily purified.

b. Short treatment processing time, Long-lasting high effect

Water quality of Japan Ikisa dam reservoir has remained stable and intact for more than 38 month since its treatment and also water quality on the river bed of downstream region of the dam has been radically improved.

c. No secondary pollution, Safe

After treatment, the inorganic polluted substances of precipitated sediment are permanently solidified while organic elements biodegrade without being eluted again.

d. Treatment not influenced by environmental factors

Treatment is not influenced by temperature varying with season or other environmental factors. Safe and radical treatment effect is assured

e. Eco-friendly, Low cost, Wide range of applications

LUMILITE water treatment technology is by no means theoretical but not practical, or practical in laboratory scale only. It is a highly effective and practical technology.

3. Type of treatment water

a. Small and medium scale of flowing water

Low flow velocity of river channel, canal, ditch, gulf, etc.

b. Large scale of quiet water

Ground water e.g. dam reservoir, natural or artificial lake, pond, fish farm, etc.

c. Water in need of special treatment process

Living and drinking water, special purpose water, municipal living sewage, various industrial sewage, etc.

4. Treatable pollutants

LUMILITE water treatment technology effectively removes various hazardous heavy metal, non-metal, oil, humic substance, blue-green algae, suspended matter, odor, etc. from water and also passes tests of biochemical oxygen demand (BOD), chemical oxygen demand (COD) and turbidity.

5. Water quality standard check-up after treatment

LUMILITE new water treatment technology can meet water quality criteria in any local country or satisfy any specific standard required by ordering body regardless of water type.

6. Range of application

LUMILITE water treatment technology has a wide range of objective and scientific applications. Under different water conditions, individually matching treatment recipe precisely prescribed is applied. **LUMILITE water treatment agents have powder, ball and chip types.** What types to use depends on specific water condition and requirements. In addition to using LUMILITE water treatment agents (powder, chip, ball, water types), some ancillary treatment process may be adopted if necessary.

LUMILITE water treatment technology is applied diversely according to the scale of water, flowing or quiet water, and high or low flow velocity of water. Water treatment recipe is dependent upon those conditions.

7. Safe water and safe environment even after treatment

The first issue to consider in any water treatment project is safety in the treated water and environment. Due to this, chemical water treatment method is, needless to say, not welcomed.

Accordingly LUMILITE targeted at eco-friendly water treatment technology since its development. -i.e. it used the organic combination of both physical and biological treatment. Passing three or more years of enduring safety tests about treated water and environment by the Japan Ministry of Construction relevant expert panel, LUMILITE water treatment technology acquired a new technology authentication from and was registered with the Japan Ministry of Construction on Sep., 2007. Reg. No (NETIS): QS-070011-A. For details, please enter the website of the Japan Ministry of Construction.

In practical application of LUMILITE new water treatment technology in Japan a variety of experimental research and analysis as well various field-proven safety test were carried out. The details are as follows:

•Experimental studies on water quality and precipitated sediment

An experimental study on below-permitted-standards (covering 27 items) elution from polluted soil ----- Exhibit 1

Permitted elution standards (covering 27 item) for polluted soil-----Exhibit 2

An experimental study on the permitted contents (covering 9 items) standard for polluted soil-----Exhibit 3

An experimental study on the evaluation (covering 41 items) of tap water use chemicals----- Exhibit 4

Detailed analysis on river water treatment (applicable to standard items) -----Exhibit 5

Detailed analysis on factory use stored water treatment (applicable to standard items) --
-----Exhibit 6

•Experimental studies on ecological safety

An experimental study on harm to plant cultivation (based on 59 silkworm 1943th
edition) -----Exhibit 7

An experimental study on fish acute toxicity (based on JIS standards) -----Exhibit 8

An experimental study on fish acute toxicity (based on OECD standards) -----Exhibit 9

An experimental study on plankton growth failure (based on OECD standard) -----
-----Exhibit 10

An experimental study on algae growth failure (based on OECD standard) -----Exhibit 11

And much more, e.g. a simulation study on the elution from reservoir bed, fluorescence
X-ray spectroscopic analysis, X-ray spectroscopic analysis, an experiment on long term feeding
fish, crustacean, and reptile, etc.

**High reliability and safety of LUMILITE water treatment technology could lead to the
successful treatment of Ikisa drinking water source reservoir in Japan, which was the Japan's
first-time direct spraying of water treatment agent over the surface of water.**