

Evaluation of Sludge Dewatering Device Enabling Low Moisture Content

(Research of FY 2018-2021)

1. Purpose

This study aims to evaluate “Type 3 Screw Press Dewatering Device (SP3)” registered on “JS Innovation Program” in 2017. The evaluation process is as follows:

- Grasp its introduction status
- Collect data of water content rate and treatment capacity of sludge in operation management
- Organize technical documents

2. Outcomes of this year

This year, SP3 was investigated about the following two subjects to verify its performance as a sludge treatment technology.

- ① Dewaterability of SP3: By reviewing twenty installation works of SP3 that JS ordered, the dewaterability is verified from information including installation documents, test operation data of dewatering device, etc.
- ② Questionnaire to municipalities who adopted SP3: Survey included questions about the performance of SP3, used chemicals, O&M status, etc. is made to fifteen municipalities. Fourteen municipalities answered the questionnaire and results are aggregated.

(1) Dewaterability at test operations: At the registration on the JS Innovation Program, SP3 was considered for its moisture content rate of dewatered sludge by sludge kinds and properties, and treatment performance by sludge generation. This time, ten examples are selected for comparison by which have calculatable dewatered sludge concentration and treatment capacity at $\phi 300\text{mm}$ of criteria. Parameters for comparison are water content rates of dewatered sludge and treatment capacity at $\phi 300\text{mm}$ of criteria. Figure 1 is the comparison of the water content rates of dewatered sludge between at the times of registration and test operation. Researchers verified that SP3 at test operation has the equivalent value of water content rates and sludge treatment capability to the target value set at the registration on the Innovation Program.

(2) The results of the questionnaire survey: Results were organized for the concentration of supplied sludge, treatment capacity, and the moisture content rate of dewatered sludge in the daily operation management.

- The water content rates of dewatered sludge were almost the same or below that at the test operation. For the treatment capacity, twelve municipal WWTPs have data that is comparable to the test operation. Seven out of twelve WWTPs have equal or greater water content rates than the test operation. Five WWTPs had less water content rate than that at the test operation. As a good example of operation, a WWTP was confirmed which has an equivalent water content rate to the test operation and improved treatment capacity by 10% more than the value set at criteria.

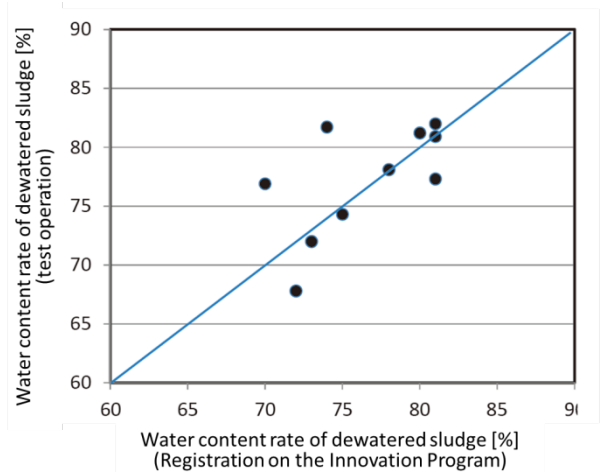


Figure 1: Comparison of water content rate of dewatered sludge between IP registration and test operation

- The major problem of a dewatering device was clogs of the screen at thickening and dewatering units. A clog at a dewatering section might cause serious failure of operation such as a significant reduction of treatment performance. Close examination is required to know if the problem is because of a mechanical structure or treatment system.

3. Future plans

The dewaterability of SP3 is investigated on a long-term basis to optimize and establish dewatering technology. Based on the results of the field survey this year, researchers continue the study on dewaterability with clear parameters and objective verification.

Keywords: Screw press dewatering device (SP3), Low moisture content, Hard-to-dewatered sludge