

# How to make dissipating blocks useful !

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Dissipating block = a block to reduce the wave power Breakwater = a block to prevent wave

## 1.Motive and Purpose

In recent years ,we have had many natural disasters in Japan. In 2011,the eastern part of Japan was hit by a powerful earthquake and a tsunami. So ,we focused on the tsunami and researched the efficiency of dissipating blocks.

## 2.Hypothesis

The smaller dissipating blocks are and the more space that is in between them, the more wave power they will absorb. This is because the wave power is dispersed in small amounts, that is the dissipating blocks will have a larger effect.

## 3.Material

- Water resistant resin clay→**dissipating blocks**
- A plastic box→**breakwater**
- Oil clay ,A water tank, A bucket

## 4.Experiment and Method

- ①We installed dissipating blocks and a breakwater into a water tank.
- ②We ran water powerfully to generate waves.
- ③We measured the water level of this area and compared the power and the height of the waves.



Figure 1: Experiment equipment

### 5.1.Experiment①

- ①breakwater only
- ②breakwater and dissipating blocks **20g × 20, 10g × 20**
- ③breakwater and dissipating blocks **40g × 15**

Table 1: the average amount of water

	①(mm)	②(mm)	③(mm)
1 <sup>st</sup>	10	5	7
2 <sup>nd</sup>	5	2	7
3 <sup>rd</sup>	7	3	5
average	7.3	3.3	6.3

### ●Wave height and momentum



Figure 2: ①



Figure 3: ②



Figure 4: ③

### 5.2.Experiment②

- ④breakwater and dissipating blocks **40g × 20**
- ⑤breakwater and dissipating blocks **40g × 15**
- ⑥breakwater and dissipating blocks **40g × 10**

Table 2: the average amount of water

	④(mm)	⑤(mm)	⑥(mm)
1 <sup>st</sup>	3	7	5
2 <sup>nd</sup>	2	7	5
3 <sup>rd</sup>	5	5	5
4 <sup>th</sup>	1	7	10
Average	2.75	6.5	6.25

### ●Wave height and momentum



Figure5: ④



Figure 6: ⑤



Figure 7: ⑥

## 7.Consideration

- ①about **the size** comparison→The dissipating effect of **pattern2** was the largest.
  - ②about **the number** comparison→The dissipating effect of **pattern4** was the largest.
- ➡**The wave power is dispersed minutely by putting many dissipating blocks because they are smaller and there is more space among the dissipating blocks.**

## 8.Conclusion

However, in reality, dissipating blocks are made from concrete and they are much heavier than what we made. Also, the distance from the place where waves generate to a breakwater is much **farther** in reality than the distance in that at our experiments. So, we want to proceed with **a large scale** experiment based on the results of these experiments.