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Technical Domain / Task Number2 TD#2 / 2.1.1

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Sea Test Results of Plastic Buoys (Polyethylene, Polyurea foam, Steel)

# Test SUMMARY

In order to analyze the advantages and disadvantages of the buoy type and derive improvement, Ministry of Oceans and Fisheries (PYEONGTAEK Regional Office of Oceans and Fisheries) and KAAN have been jointly test.

- Test location: Pyeongtaek-Dangjin Port(Nearby Bangdo) in Korea

- Test period: Feb. 2016. ~ Feb. 2018

- Test Samples: 5(Polyethylene 3, Polyurea foam 1, Steel 1)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Body** | **diameter(㎜)** | **height(㎜)** | **draft(㎜)** | **weight(kg)** | **color** | **install date** | **quantity** |
| PE(JET-7000) | 2,600 | 8,789 | 2,996 | 2,085 | R | ‘16.2.19 | 2 |
| PE(PB-26) | 2,600 | 10,513 | 4,469 | 3,539 | R | ‘16.2.19 | 1 |
| Poly Urea Foam | 2,800 | 6,900 | 4,600 | 4,923 | WB | ‘16.3.18 | 1 |
| Steel(LL-26(M)) | 2,600 | 9,400 | 4,100 | 5,982 | R | ‘16.2.19 | 1 |



Figure Photograph of Sea Test (installed buoys)

## Light buoy stability

In order to analyze stability of the light buoys, two-axis tilt angle meters (X, Y-axis measurement of the dynamic angle of tilt in two directions) were installed in the upper steel tower of the light buoys.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Classification | BangdoTest A  (JET-7000) | BangdoTest D  (PB-26) | BangdoTest E  (LL-26(M)) | Remark |
| Maximum tilt angle | 38.6° | 38.5° | 38.8° |  |
| Measurement Period | 16. Jun. 2016 ~ 25. Oct. 2016 (5 months) | | | |

Daily maximum tilt angle of the BangdoTest A (JET-7000), BangdoTest E (LL-26M) is significantly changing the slope, but BangdoTest D (PB-26) is gradually changed.

The cause for the maximum inclination angle of the measuring buoy is unknown. It is necessary to check the stability analysis of the maximum inclination angle from the data measured for about two years.

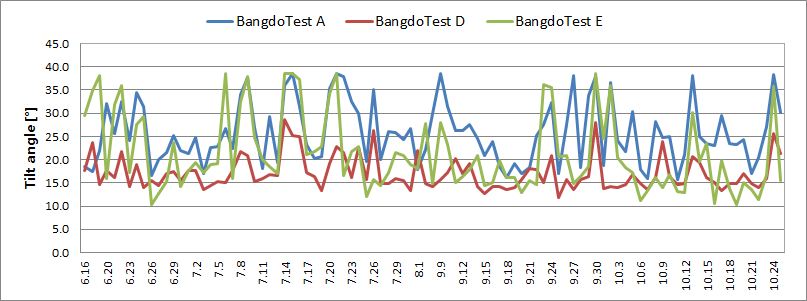


Figure 2 Graph of Daily Maximum Tilt angle

## Chromaticity change of Surface colour

Although the surface colour of the test light buoys is changed with time, it meets the criteria.

   \* Portable Spectrophotometer (CM-2600d, KONICA MINOLTA) used only flat color change over time for inspection

|  |  |
| --- | --- |
| EMB0000bcf81a1c | EMB0000bcf81a1d |
| BangdoTest A (JET-7000) | BangdoTest C (Polyurea foam) |
| EMB0000bcf81a1e | EMB0000bcf81a1f |
| BangdoTest D (PB-26) | BangdoTest E (LL-26M) |
| \* Measurement date: First (16.3.18), Second (16.5.25), Third (16.6.17), Forth (16.9.8), Fifth (16.11.14) | |

Figure 3 Result of measuring Surface colour

## Attachment state of sea algae and shellfish

In the inspection (after 4 months of installation), there is a difference in the attachment of marine organisms depending on whether the antifouling paint is painted.

In the inspection (after 9 months of installation), marine organisms adhered regardless of the antifouling paint (there is a difference in the degree of adhesion).

|  |  |
| --- | --- |
| EMB0000bcf819b8 | EMB0000bcf81a20 |
| 1. After 4 months | 1. After 9 months |
| BangdoTest A (JET-7000) | |
| EMB0000bcf819f9 | EMB0000bcf819fa |
| 1. After 4 months | 1. After 9 months |
| BangdoTest C (Polyurea Foam) | |
| EMB0000bcf819fb | EMB0000bcf819fc |
| 1. After 4 months | 1. After 9 months |
| BangdoTest D (PB-26) | |
| EMB0000bcf819fd | EMB0000bcf819fe |
| 1. After 4 months | 1. After 9 months |
| BangdoTest E (LL-26M) | |

Figure 4 Comparison of attachment state of marine organisms

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Leave open if uncertain [↑](#footnote-ref-2)