

## **RANCANG BANGUN PROTOTYPE ALAT PENYULING AIR LAUT MENJADI GARAM DAN AIR BERSIH YANG ERGONOMIS MENGUNAKAN METODE RASIONAL**

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### **ABSTRAK**

Kebutuhan garam nasional sekitar 1,839 juta ton per tahun terdiri atas garam konsumsi 855.000 ton dan garam industri 984.000 ton. Kebutuhan garam untuk industri sudah menempati urutan teratas yaitu 76%,. Kebutuhan garam konsumsi untuk makanan merupakan 72%. Kabupaten Rembang sebagai penghasil garam terbesar di Jawa dapat menghasilkan garam industri 60-600 ton/bulan dan garam konsumsi 21-120 ton/bulan dan setiap tahunnya Kabupaten Rembang terlanda kekeringan di pesisir laut sebanyak 41 desa yang tersebar di kecamatan Kabupaten Rembang. Berdasarkan permasalahan yang dihadapi untuk mengurangi ketergantungan proses pengolahan garam dengan energi panas matahari dan mengatasi krisis air bersih maka di buat alat pengering dan penyuling air laut. Dimensi alat rancangan untuk pekerja dengan tinggi 140 cm, panjang 81 cm dan lebar alat 40 cm. Alat pengering dan penyuling air laut ini dirancang menggunakan metode rasional, metode rasional ini memiliki 7 tahapan antara lain clarifying objectives, establishing function, setting requirement, determining characteristics, generating alternatives, evaluating alternatives dan improving details. Dari perhitungan menggunakan metode rasional alternatif yang dipilih untuk material produk ialah kerangka besi, dandang stainless, kondensor besi, pendingin kondensor plastik dan penampung air plastik. Hasil percobaan pengeringan dan penyulingan air laut menjadi garam dengan data air bersih sebanyak 30 sampel per 15 menit, menunjukkan skala Ph dan TDS (Total Dissolved Solid). Kadar pH air dari sampel awal 9,3 sampai sampel ke-30 yaitu 8,6 dengan batasan pH air bersih 9 dan kadar TDS sample awal 195 ppm sampai sample ke-30 yaitu 45 ppm dengan batasan maksimum 1000 ppm untuk air bersih.

Kata Kunci : Kata kunci : perancangan anthropometri, metode rasional, dimensi alat dan pengujian air.

## **PROTOTYPE DESIGN TOOL SEA SALT AND WATER BEING ERGONOMIC USING RATIONAL**

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### **ABSTRACT**

The needs of national salt is about 1.839 million tons per year which is consisting of salt consumption about 855,000 tons and industrial salt about 984 000 ton. The needs of salt for industry has reached the top of rank about 76%. Salt needs for food consumption is 72%. Rembang as the biggest salt producer on Java Island can produce salt industry until 60-600 tons/ month and salt for consumption about 21-120 tons/ month and every year Rembang district devastated by drought in the coastal sea as many as 41 villages in the district in Rembang. Based on the problems to reduce dependence on the processing of salt by solar thermal energy and overcome the water crisis then the writer made sea water's dryers and distiller. Dimensions tool designed for workers with 140 cm high, 81 cm long and 40 cm wide appliance. Dryers and sea water distiller is designed using rational method. The rational method has 7 stages include clarifying objectives, establishing function, setting requirements, determining characteristics, generating alternatives, evaluating alternatives and improving details. From rational alternative calculation method has chosen for the product material that is metal frame, boiler steel, iron condensers, condenser cooling water reservoir plastic and plastic. Results of the experiment is drying and distilling seawater into salt water with the data as much as 30 samples per 15 minutes which shows scale of pH and TDS (Total Dissolved Solid). pH level of water from the initial sample is 9.3 to sample-30 is 8.6 with the limitation of water pH is 9 and levels of TDS from initial sample is 195 ppm to sample-30 is 45 ppm with a maximum limit of 1000 ppm for clean water.

**Keyword** : Keywords: design anthropometry, rational method, the dimensions of the test apparatus and distilled water.