

Pengembangan masa phase change materials sebagai elemen pemanas inkubator bayi non-elektrik = Mass development of phase change materials as heating element for non-electric neonatal incubator

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Abstrak

[Salah satu tantangan dalam meningkatkan standar kesehatan di Indonesia adalah masih tingginya angka kelahiran bayi prematur. Upaya penyelamatan bayi yang lahir prematur terhambat oleh beberapa faktor terutama faktor ekonomi yang disebabkan mahalanya biaya perawatan di ruang NICU rumah sakit. Selain itu, distribusi listrik yang belum merata menyebabkan sedikitnya rumah sakit yang menyediakan fasilitas inkubator terutama pada wilayah terpencil di Indonesia. Penggunaan Phase Change Materials dari kelompok organik sebagai elemen pemanas inkubator portable non-elektrik agar aman bagi pernafasan bayi dan mudah pendistribusiannya menjadi salah satu alternatif upaya penyelamatan bayi prematur yang lahir terutama di wilayah yang belum dialiri listrik nasional. Eksperimen ini bertujuan mendapatkan masa PCM yang paling efisien sesuai Standar Nasional Indonesia untuk mendapatkan rentang waktu dan temperatur paling ideal bagi bayi prematur. Juga pengurangan masa PCM akan meringankan bobot inkubator secara total serta mengurangi biaya. Eksperimen dilakukan menggunakan prototype Inkubator Grashof seri-F yang memanfaatkan fenomena konveksi natural dalam proses pemanasan ruang inkubator. Temperatur diukur menggunakan termokopel tipe K yang dihubungkan pada Modul NI9211. Grafik pengukuran digambarkan oleh perangkat lunak Labview 8.5 yang diinstal pada Personal Computer Unit. Hasil eksperimen menunjukkan masa PCM jenis Beeswax sebesar 3kg adalah yang paling efisien dalam penggunaan energi. Aplikasi fin juga membantu mempersingkat waktu tunggu sebelum penggunaan inkubator dan distribusi panas yang lebih merata dalam ruang inkubator.

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