Studi Analisis Pengaruh Penambahan Polikarboksilat dan Sodium Fosfat sebagai Aditif Rheology Modifier terhadap Sifat Mekanis Refraktori Castable Konvensional = Anaytical Study Of The Effect On The Addition Of Polycarboxylate And Sodium Phosphate As Rheology Modifier Additives On The Mechanical Properties Of Conventional Castable Refractory

Bagas Naviadi, author

Abstrak

Refraktori castable konvensional digunakan secara umum sebagai material penunjang pada industri pengecoran logam dan sektor industri manufaktur lainnya yang memiliki proses pemanasan hingga suhu tinggi. Aplikasi dari castable konvensional yang umum digunakan sebagai lapisan pada instalasi tungku maupun boiler, mengharuskan proses pemasangan serta sifat dari material refraktori yang tepat sehingga mempermudah dalam proses instalasi. Penelitian ini memiliki fokus untuk melihat pengaruh penambahan jenis aditif rheology modifier terhadap sifat mekanis refraktori castable kovensional. Dimana jenis aditif rheology modifier diperuntukan untuk meningkatkan sifat-sifat mekanis yang dapat mempermudah proses instalasi dari material refraktori castable baik dari waktu maupun proses instalasi. Sifat mekanis pada penelitian dilakukan dengan melakukan pengujian mekanis berupa kuat tekan, kuat lentur, massa jenis serta penyusutan untuk melihat efek penambahan variasi kadar aditif baik polikarboksilat maupun sodium fosfat sebesar 0.1% wt, 0.3% wt dan 0.5% wt dan juga castable konvensional yang tidak diberi penambahan aditif, dengan diberi perlakuan panas setelah proses pencetakan dengan suhu ruang, suhu 110oC dan 815oC. Hasil penelitian menunjukan penambahan aditif polikarboksilat cenderung menghasilkan sifat mekanis yang lebih optimal dibandingkan sampel tanpa aditif dan dengan penambahan sodium fosfat. Penambahan dari masing-masing aditif memiliki kecenderungan optimal pada penambahan 0.3%wt, sedangkan pada penambahan 0.5%wt harus diiringi dengan suhu perlakuan panas yang sesuai.

.....Conventional castable refractory is used in general as a supporting material in the metal casting industry and other manufacturing industry sectors that have a heating process to high temperatures. The application of conventional castables, which are commonly used as layers in furnace and boiler installations, requires the installation process and the nature of the right refractory material so as to facilitate the installation process. This study has a focus on looking at the effect of the addition of rheology modifier additive types on the mechanical properties of conventional castable refractory. Rheology modifier additive is intended to improve mechanical properties that can facilitate the installation process of castable refractory materials both from time and installation process. The mechanical properties of the study were carried out by conducting mechanical tests in the form of compressive strength, bending strength, density and shrinkage to see the effect of adding variations in additive levels, both polycarboxylate and sodium phosphate by 0.1% wt, 0.3% wt and 0.5% wt and also conventional castables that were not given additive additions, by being heat treated after the printing process with room temperature, temperatures of 110oC and 815oC. Results showed that the addition of polycarboxylic additives tended to produce more optimal mechanical properties than samples without additives and with the addition of sodium phosphate. The addition of each additive has an optimal tendency at an addition of 0.3%wt, while in addition to 0.5%wt it should be accompanied by an

appropriate heat treatment temperature.