

Up-scaling of resorcinol-formaldehyde (RF) and carbon (C) aerogel synthesis to pilot plant scale production for their use as sand core additives in the foundry industry

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One of the biggest obstacles for resorcinol formaldehyde (RF) and carbon (C) aerogels to enter the market is their poor availability on a large scale. In general, the industry is very interested, but often industry-related testing is not possible due to lack of large quantities. Within the three year project AeroPROCast, sponsored by the German Federal Ministry for Economic Affairs and Energy (BMWi), routines for the technical production of RF and C aerogel granulates will be developed. Around 100 liters of sol are prepared in one batch. After aging and drying, carbonization of the as prepared RF aerogel leads to the desired C aerogel. The properties of these aerogels synthesized in laboratory and technical scale according to the same recipe are compared and presented. The required granular size of the aerogels is realized by simple grinding of the monolithic pieces. The aerogel granulate is used as sand core additive [1] to avoid many casting defects and therefore reduce the casting rejection [2]. This leads to an increase of energy efficiency as reflected by first economic studies of the industrial project partner.

[1] Ratke L., Milow B., Gießereikerne mit verbesserten Eigenschaften II, Patent DE102008056842A1

[2] Meyer E., Barowski A., Schestakow M., Milow B., Ratke L., Aerogele als Sandkernadditive zur Verbesserung der Gussteilqualität, GIESSEREI 103, 2016, 40-45