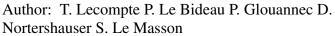
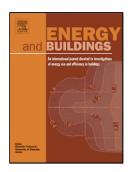
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Nortershauser S. Le Masson

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1 Mechanical and thermo-physical behaviour of concretes and mortars

2 containing Phase Change Material

- 3 T. Lecompte^{*1}, P. Le Bideau¹, P. Glouannec¹, D. Nortershauser², S. Le Masson²,
- ⁴ ¹Univ. Bretagne-Sud, EA4250, LIMATB F, 56100 Lorient, France
- ⁵ ²France Telecom R&D, 2 Av. Pierre Marzin, 22300 Lannion, France
- 6 *<u>thibaut.lecompte@univ-ubs.fr</u>, +33(0)2.97.87.45.76, Centre de recherche Christiaan Huygens, BP92116, 56321

7 Lorient Cedex.

8 Abstract

9 This study deals with the inclusion of micro encapsulated Phase Change Materials (PCM), up 10 to 29% in volume, in concretes and mortars. Thermal and mechanical characteristics of 11 hardened mixes are measured and compared with classical civil engineering models. PCM 12 microcapsules behave as voids on a mechanical point of view, and as properly dispersed 13 spheres on a thermal point of view. It is shown that PCM included in a mineral matrix to 14 make building blocks could have a beneficial effect on walls thermal behaviour, keeping a 15 consistent mechanical strength.

16 Keywords

17 Phase Change Material (PCM); Concrete; Mortar; Mechanical properties; Thermal analysis.

18 Nomenclature

С	Mass of cement per cubic meter of mixture [kg]
L_{f}	Latent heat of melting of the PCM
L _m	Latent heat of freezing of the PCM
T_{hot}	Temperature of the hot plate during the guarded hot plate test [°C]
$\mathrm{T}_{\mathrm{cold}}$	Temperature of the cold plate during the guarded hot plate test [°C]
T_{middle}	Temperature in the middle of the sample during the guarded hot plate test [°C]
W	Mass of water per cubic meter of mixture [kg]
W_{PCM}	Mass of water equivalent to the volume of PCM nodules per cubic meter of mixture [kg]

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