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Data Article

Dataset of tensile strength development of concrete with manufactured sand

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ABSTRACT

This article presents 755 groups splitting tensile strength tests data of concrete with manufactured sand (MSC) in different curing age ranged from 1 day to 388 days related to the research article “Experimental study on tensile strength development of concrete with manufactured sand” (Zhao et al., 2017) [1]. These data were used to evaluate the precision of the prediction formulas of tensile strength of MSC, and can be applied as dataset for further studies.

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Specifications Table

Subject area	Construction and building materials
More specific subject area	Building materials
Type of data	Table
How data was acquired	Tests and collection

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Data format	Raw and filtered
Experimental factors	Publicly available data sources
Experimental features	Testing the splitting tensile strengths at different curing age of MSC with different stone powder content and water-cement ratio (or water-binder ratio) in laboratory situation.
Data source location	Zhengzhou City, China.
Data accessibility	Data within this article.
Related research article	S.B Zhao, X.X Ding, M.S Zhao, C.Y. Li, S.W Pei. Experimental study on tensile strength development of concrete with manufactured sand. <i>Constr. Build. Mater.</i> In press.

Value of the data

- The data indicating splitting tensile strength of MSC at different curing age in laboratory situation.
 - The data are publicly available, but are scattered in many different articles.
 - Be useful for comparing tensile strength of MSC with that of concrete made by different aggregates.
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1. Data

755 groups splitting tensile strength test data of MSC were assembled from 41 experimental studies [1–41] including detailed properties of raw materials and mix proportions as well as basic properties of fresh and hardened MSC, which were collected from authors' experiments and other researches presented.

2. Experimental design, materials and methods

Table A gives 755 groups splitting tensile strength tests data of MSC in different curing age ranged from 1 day to 388 days. Raw materials of MSC were the ordinary silicate cements, the admixture consisted of fly ash, slag and silica fume, the crushed stone and the manufactured sand. The cement' compressive strength and tensile strength at 28 days ranged in 35.5–63.4 MPa and 6.9–10.8 MPa, respectively. The maximum grain size of crushed stone ranged from 12 mm to 120 mm. The fineness modulus of manufactured sand was 2.2–3.55. As these studies were done based on different codes, different maximum particle sizes of 0.075 mm and 0.160 mm were defined for stone powder in manufactured sand. The contents of stone powder with particle size of 0–0.075 mm ranged in 0–21.8%, whereas those with particle size of 0~0.160 mm varied in 0~40%. The water-binder ratio $W/B=0.24\text{--}1.00$, while the water-cement ratio $m_w/m_c=0.30\text{--}1.43$. The sand ratio was 24–54%. The compressive strength of MSC at 28 days ranged from 10.1–96.3 MPa, the slump of fresh MSC varied from 10 mm to 260 mm, the curing time of specimens ranged from 1 day to 388 days.

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