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## Formula for Evaluation of Flexural Strength on Bending Test by Use of a Cylinder Typed Specimen

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In this paper, the formula of four-point bending (Four-point bending test of the beam having a circular cross section, FPBc) test and three-point bending (Three-point bending test of the beam having a circular cross section, TPBc) test by use of short cylinder typed specimen is proposed to evaluate the flexural strength of rock or concrete, the strength of bedding plane of sedimentary rock and construction joint of concrete. Firstly, the stress distribution within cylinders with various lengths is analyzed by the three dimensional Finite Element Method. Then the formula is proposed based on the analyzed results for the four-point bending (Four-point bending test of the beam having a rectangular cross section, FPBr) test and the three-point bending (Three-point bending test of the beam having a rectangular cross section, TPBr) test of ASTM, JIS by the use of the beam having a rectangular cross section, and the FPBc and TPBc tests. The specimen with 5-10cm in diameter and 10-20cm in length is used in the FPBc and TPBc tests. This dimension is that used in uniaxial compression test of concrete or rock drilled core. Secondly, a series of the FPB and TPB tests by use of both type of specimen is performed by the use of granite specimen with various lengths, then it is shown that the flexural strength is evaluated by the proposed formula and compared with that by the conventional one. Finally, it is made clear that the suggested three-point bending (TPBc) by use of the cylinder typed specimen is available for evaluating the flexural strength of concrete and rock easily.