

## **Modelling of fresh concrete behaviour under vibration**

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### **SUMMARY**

Although the behaviour of concrete under vibration has been investigated extensively, the true nature of the mechanism of concrete vibration has yet to be explained since the dynamic forces acting upon concrete are not sufficiently known. For the investigation of this phenomenon, an apparatus - a vibration rheometer - has been developed. The material specimen, the main parts of the apparatus and the source of vibration form a unique oscillatory system whose parameters can be measured with sufficient precision. Simultaneously, a theoretical solution of the oscillation of a modified Bingham model under forced vibration has been derived. The solution is very complex due to discontinuous deformation of the model.

On the basis of test results obtained on two different specimens of fresh concrete and the theoretical solution, it has been found that, under dynamic and static forces combined, the specimen behaves as a Bingham model as in the known cases where the forces were basically of a static nature. The yield value, the coefficient of plastic viscosity and the values of dynamic forces in the system, have been determined by using the numerical method.

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