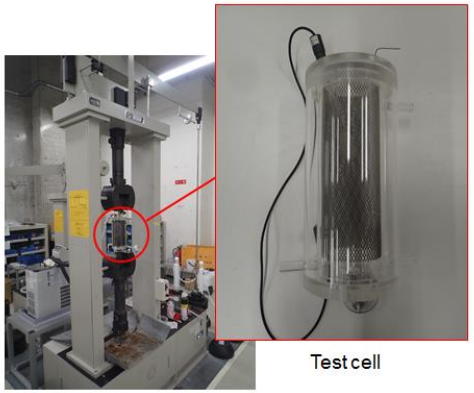
H12

New acceleration test for rebar in concrete poles



Test equipment

Test cell

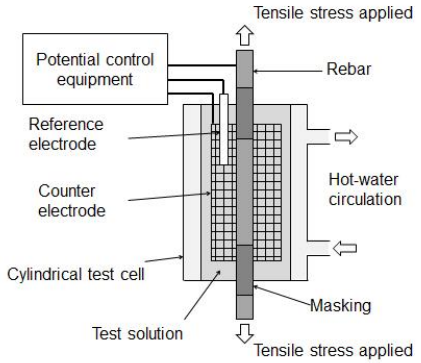
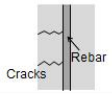
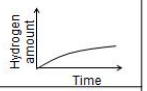
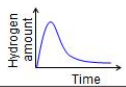
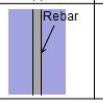
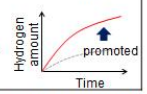


Fig. Test cell for new test

Table Comparison of actual environment, FIP* test and new test

	Surrounding environment	Condition of rebar surface	Profile of hydrogen penetration
Actual environment (in concrete pole)	Concrete neutralized by cracks (pH8) 	Hydrogen penetration while the surface of the reinforcing bars stays intact 	Hydrogen amount increases with time 
FIP test (conventional test)	Acidic solution (pH4) 	Hydrogen penetration while the surface of the rebar is dissipated by corrosion 	Hydrogen amount decreases after initially increasing 
New test	Weak alkaline solution simulating a neutralized concrete environment (pH8) 	Hydrogen penetration while the surface of the reinforcing bars stays intact 	Hydrogen-penetration profile in a real environment is steepened. 

*Fédération Internatioanle de la Précontrainte

The resistance of rebars in concrete poles to hydrogen embrittlement must be evaluated as a safety measure. In this study, a method using weak alkaline solution and cathodic charge was developed that can reproduce conditions similar to those of a real environment.

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