

,

()

()

1.

21

IT, BT, NT

가

,

가

.

.

,

.

(, ,),

,

가가 ,

[1]

,

,

가

.

,

,

.

.

,

,

[2,3]

,

,

가

,

,

.

,

,

가

[4]

,

가

[5,6]

2.

(zero emission)

가가

(ecology)

가

NEDO (93 ~96)

가

(JIS)

가

가

가

(2CaO·SiO₂)

CO₂

가
Fe₂O₃, Al₂O₃, SO₃

가 C₄A₃S, C₂S, C₄AF

SiO₂가

100

)

ACBM

MDF(

가

[7]

가가

3.

3.1

1960

(NSF

PNS)

(MSF

PMS)

가 0.5-3.0%

20%

AE

PNS

PMS

()

가

PNS

PMS

가

PNS

PMS

PC(Polycarboxylate)

1997

PC

가

, 1999

18 cm

30 MPa

PC

PC

가

가

3.2

가

(migrating corrosion inhibitor)

(ZnO),

(Na-molybdate),

(tetramethyl phosphonium nitrite)

(amino-carboxylate)

가

3.3

가

가

(antiwashout

admixture)

(anti-segregating admixture)

가

K

3.4

(metakaolin)

(kaolin)

10%

가

가 (ettringite)

(alite)

가

가

4.

4.1

(self-compacting concrete, SCC)

가

SCC

가

1989

Okamura

SCC

/

가

SCC가

. SCC OPC

가

가

SCC가

가

4.2

1975

74

Water Tower Place

630 kgf/cm²

, 800 kgf/cm²

Two Union Square

1,300 kgf/cm²

가

,

800 kgf/cm²

,

600-700

kgf/cm²

가

.

가 1,500 kgf/cm²

가

(Reactive Powder Concrete, RPC)

200 mm

28

가

2,000 kgf/cm²

, 90°C

2

3

가

2,400 kgf/cm²

[8]

RPC

Sherbrooke

Monaco

,

가

가

,

가

4.3

1980

가

가

,

,

,

AE

,

,

. 1990

Great Belt Link

Confederation Bridge

EU 가 12

1996-2000

5

DuraCrete

[9]

가

[10]

Life365

가

가

가

가

5.

2010

CO₂

21C

가

1. Proceedings of the 4th Beijing International Symposium on Cement and Concrete, Beijing, 1998.
2. Proceedings of the Sixth CANMET/ACI International Conference on Superplasticizers and Other Chemical Admixtures in Concrete, (Edited by V.M. Malhotra), Nice, France, Oct. 2000, (SP-195).
3. Proceedings of RILEM International Symposium on The Role of Admixtures in High Performance Concrete, Monterrey, Mexico, March 21-26, 1999.
4. Proceedings of International Symposium on High Performance Concrete-Workability, Strength and Durability, Hong Kong & Shenzhen, China, Dec. 10-16, 2000.
5. Proceedings of the Fifth CANMET/ACI International Concrete on Recent Advances in Concrete Technology, Singapore, July - August, 2001.
6. Proceedings of The Second International Symposium on Self-Compacting Concrete, (Edited by K. Ozawa & M. Ouchi), Tokyo, Japan, Oct. 23-25, 2001.
7. Center for Advanced Cement-based Materials "Cementing the Future" ACBCM, Vol. 12, No. 2, Spring 2001.
8. P.-C. Aitcin et al. "The Sherbrooke Reactive Powder Concrete Footbridge" Structural Engineering International, 2/98, pp 140-144.
9. DuraCrete: General Guidelines for Durability Design And Redesign. The European Union – Brite EuRam III, 2000.
10. Bentz, E. C., and Thomas, M. D. A., "Life365 Service Life Prediction Model" Silica Fume Association, 2001, pp. 34-46.