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*(C&DW)Construction & Demolition Waste*

*Recycled Concrete Aggregate (RCA)*

( ) *Control mix CM*  
( )

*. Recycled Aggregate Concrete (RAC)*

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[5,6]

: -1

12.6

[1]

-2

. [2]

[7]

(..

)

[8]

850

[8]2010

[9,10,11]

(*RAC*) *Recycled Aggregate*

*Concrete*

[3,12,13,14,15,16]

-2-1

[17]

. [4,3]

[21]

.%30

:

-2-2

(. ) [18]

% 18.6

( )

% 11-5

:

-2-3

[19]

[22]

%100

%60

%100

:

-3

[20]

*CM control mix*

( )

28

*W/C*

*D<sub>max</sub>*

( )

( )

30,65,100%

*NFA*

:

-

(*RFCA*)*Recycled fine* ( )  
*concrete Aggregate*

(RFBA) Recycled fine brick Aggregate ( )

NCA, NFA, RFCA, RFBA :

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[23]

:( )

-3-1

(NCA, NFA) ( )

(RCA)

(1 2 )

NCA

1

( )	1 1/2	1	3/4	1/2	3/8	N° 4
%	100	100	95.1	71.1	24.9	1.5
%( )	17.5					
	2.72					
%	0.49					

( ) NFA

2

( )	3/8	N° 4	N° 8	N° 16	N° 30	N° 50	N° 100	N° 200
%	100	98.4	81.3	66.7	47.2	26.8	19.3	10.6
%	72							
	2.53							
%	1.21							

:RFA

-3-2

(RFCA)

4 3

(RFBA)

(RFCA)

3

( )	3/8	N° 4	N° 8	N° 16	N° 30	N° 50	N° 100	N° 200
%	100	99.0	85.3	71.3	51.5	29.9	15.7	8.8
%	76							
	2.53							
%	7.52							

(RFBA)		4						
( )	3/8	N° 4	N°8	N°16	N°30	N°50	N°100	N°200
%	100	100	88.9	69.9	52.3	31.2	22.5	14.4
%	69							
	2.38							
%	9.22							

:RAC

-3-3

: -1-3-3

42.5 - :C -  
 NA -  $D_{max}=20$  W/C=0.55 250 Kg/cm<sup>2</sup>  
 ( ) 12.5 ±1.0 cm  
 S ( ) -

RFCA, RFBA,

: 2-3-3

Eurocode2.ECU2

30 min

:

( ) CM  
 10 \*10\*55 15\*15\*15 ) RAC<sub>c-30</sub>  
 15\*30 30% ( )  
 ) RAC<sub>c-65</sub>  
 65% ( )  
 12.5±1.0 cm RAC<sub>c-100</sub>  
 100% ( )  
 ) RAC<sub>b-30</sub>  
 30% ( )  
 5 ) RAC<sub>b-65</sub>  
 Δ% 6 65% ( )  
 ) RAC<sub>b-100</sub>  
 : 100% ( )

## 5

	C Kg	Agg Kg	S Kg	W Kg	$D_{max}$	cm	$30_{min}$ Cm
CM	380	980.4	692.2	210	20	12.6	12.4
RAC <sub>c-30</sub>	380	980.4	484.6+207.6	210	20	12.3	12.1
RAC <sub>c-65</sub>	380	980.4	242.2+450	210	20	11.9	11.6
RAC <sub>c-100</sub>	380	980.4	0+692.2	210	20	11.2	11.0
RAC <sub>b-30</sub>	380	980.4	484.6+207.6	210	20	12.0	11.8
RAC <sub>b-65</sub>	380	980.4	242.2+450	210	20	11.4	11.0
RAC <sub>b-100</sub>	380	980.4	0+692.2	210	20	10.8	8.5

## 6

	Kg/m <sup>3</sup>					
		$\Delta\%$	7days	$\Delta\%$	28days	$\Delta\%$
CM	2608	0	2600	0	2612	0
RAC <sub>c-30</sub>	2600	0.3	2595	0.2	2612	0
RAC <sub>c-65</sub>	2579	1.1	2570	1.2	2590	0.8
RAC <sub>c-100</sub>	2513	3.6	2502	3.8	2520	3.5
RAC <sub>b-30</sub>	2588	0.8	2584	0.6	2600	0.4
RAC <sub>b-65</sub>	2524	3.2	2504	3.7	2525	3.3
RAC <sub>b-100</sub>	2437	6.6	2416	7.1	2468	5.5

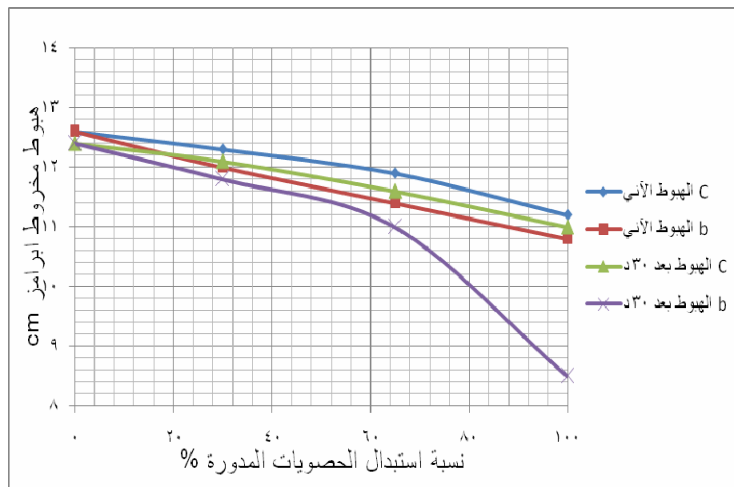
## 7

	MPa					
	7 Days	$\Delta\%$	28 days	$\Delta\%$	56 days	$\Delta\%$
CM	10.2		28.7		30.1	
RAC <sub>c-30</sub>	9.9	2.9	26.9	6.3	29.5	1.99
RAC <sub>c-65</sub>	8.6	15.7	24.1	14.3	28.9	3.99
RAC <sub>c-100</sub>	7.8	23.5	22.2	22.6	28.1	6.6
RAC <sub>b-30</sub>	9.8	3.9	25.7	10.5	28.0	6.98
RAC <sub>b-65</sub>	7.9	22.6	24.6	17.8	25.4	15.6
RAC <sub>b-100</sub>	6.2	39.2	18.3	36.3	20.1	33.2

## 8

	MPa	
	28 days	$\Delta\%$
CM	4.8	0
RAC <sub>c-30</sub>	4.6	4
RAC <sub>c-65</sub>	4.3	10
RAC <sub>c-100</sub>	3.8	21
RAC <sub>b-30</sub>	4.3	10
RAC <sub>b-65</sub>	4.1	15
RAC <sub>b-100</sub>	3.2	34

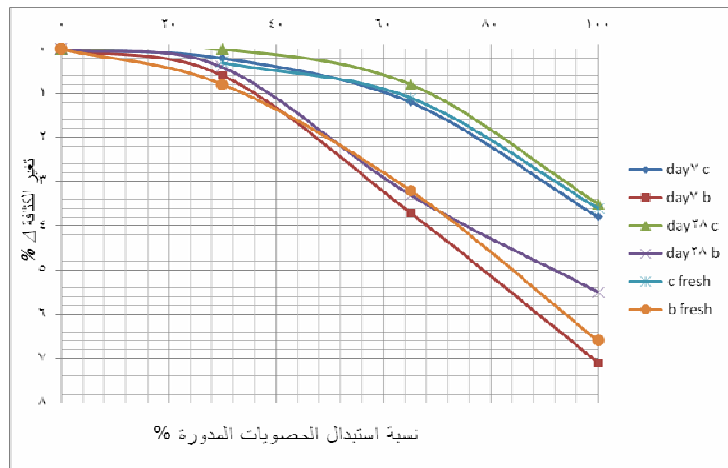
	MPa	
	28 days	$\Delta\%$
CM	3.3	0
RAC <sub>c-30</sub>	3.1	6
RAC <sub>c-65</sub>	3.0	9
RAC <sub>c-100</sub>	2.8	15
RAC <sub>b-30</sub>	2.9	12
RAC <sub>b-65</sub>	2.7	18
RAC <sub>b-100</sub>	2.5	24



30min

(1)

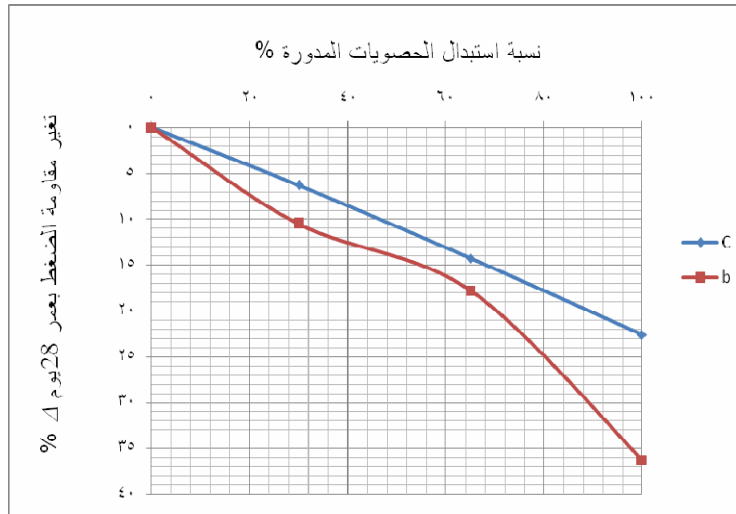
RFCA: , RFBA: bC



8 7

(2)

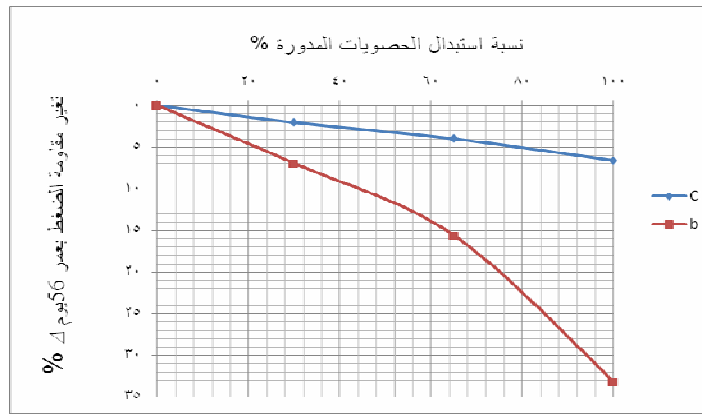
RFCA , RFBA : bC



28

(3)

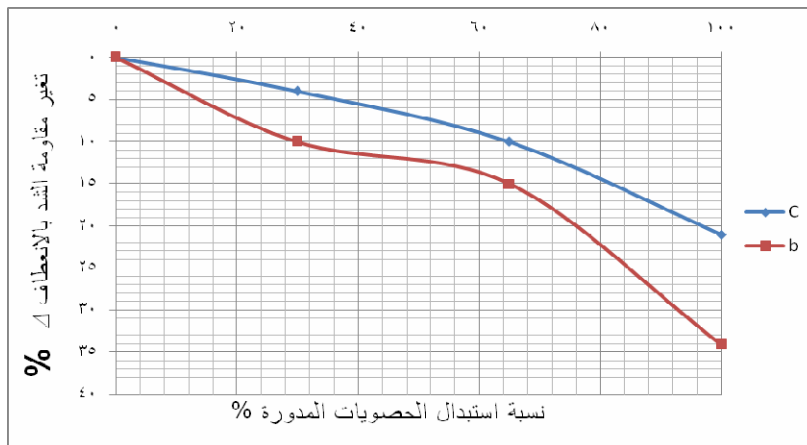
RFCA : , RFBA : bC



56

(4)

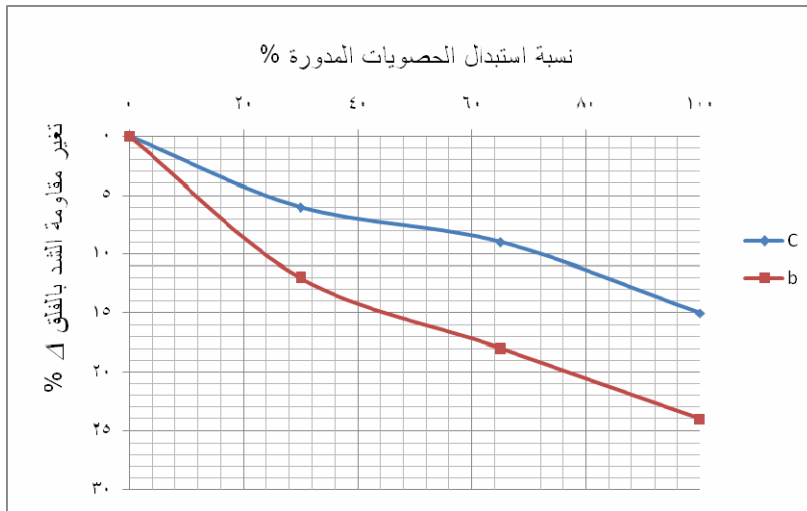
RFCA : , RFBA : bC



(5)

RFCA : , RFBA : bC





(6)

RFCA : , RFBA : bC

(

3 ) ( )

(4

56 28

2

3 ( 3.6 7.7) %

(36.3 22.6)% 28

.65%

5

6 .(21 34)%

(24 ...15)%

100%

56 28

( )

( )

30

1

100%

)

---

:

-1

)

%100

(

-2

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-3

%65

%100

-4

.%65

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-1

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-2

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recycled from construction of demolition waste. Porto Alegre 2001:390].

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