

() =
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). - 2015. - 1 (84). - . 192-198

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,

t=39-40⁰

,

60-70⁰

4-6

5-7

1,2-2,0⁰ /

35-50⁰ .

-

,

.

1

400,
5-20

2,73,

5-6

12

-4.

-

[1].

5, 90, 175

()

(

7-10).

(

20-30

)

[2].

200-250 / ²

22-24

-14

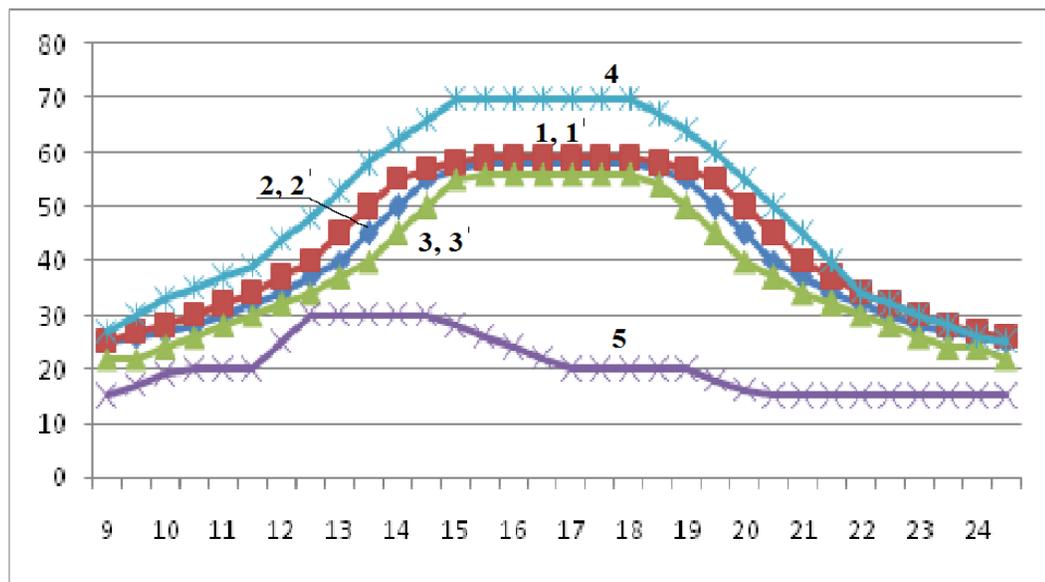
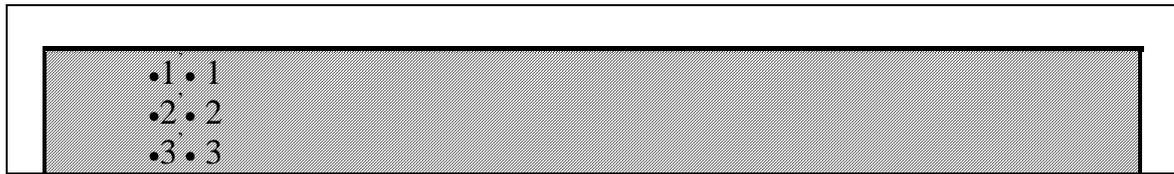
(25 20),

1

1.

1-

	,		-
1	60	28	869
1'	59	28	864
2	58	27	860
2'	59	26	858
3	58	27	853
3'	57	26	856
36-25			



1, 1', 2, 2', 3, 3' -

; 5 -

; 4 -

1 -

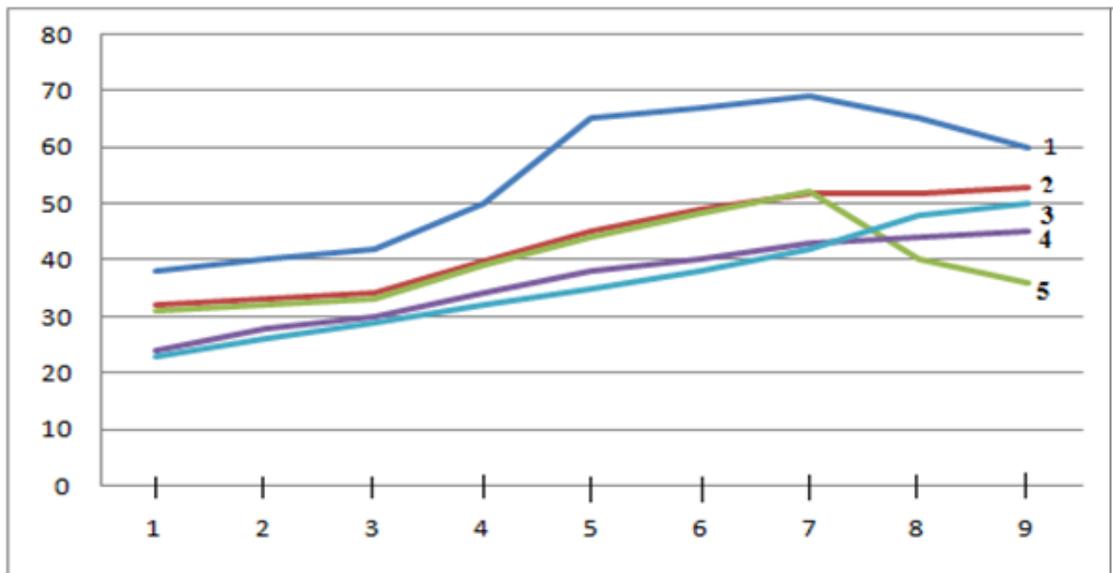
-18

56-57⁰ ,
30-25⁰ ,

10-15% ,

[4].

[5].



1-

, 2-

, 3-

, 4-

, 5-

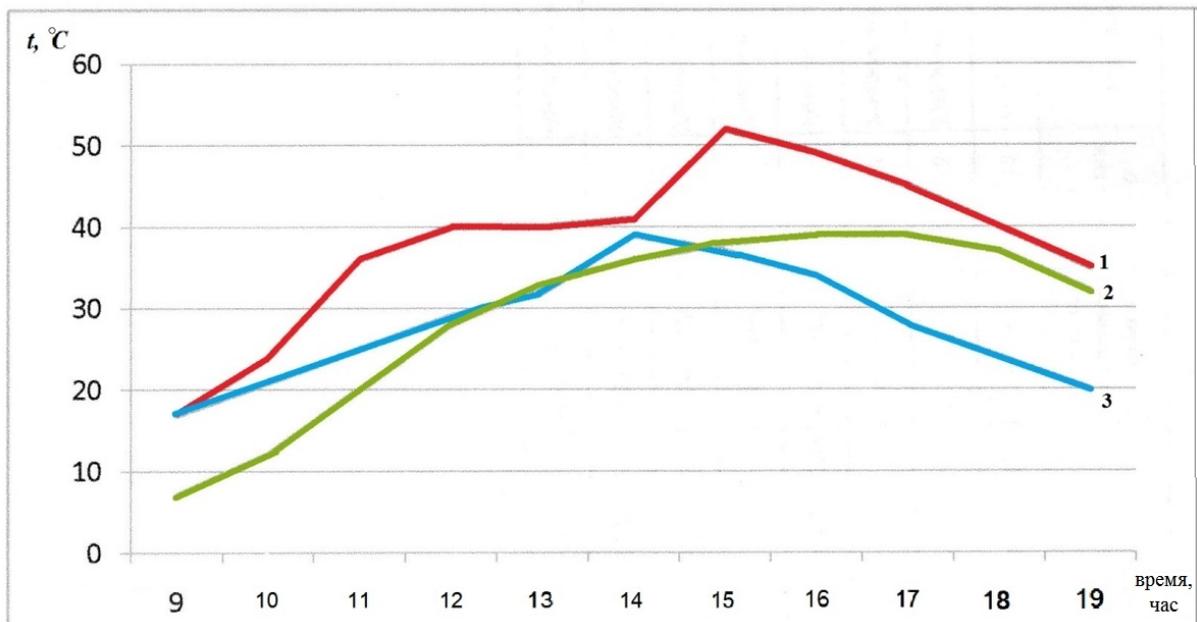
2 -
200 300 600

(Ø5)-850,0 / 3,
-150,0 / 3,
-80,0 / 3,
(-3)- 0,8 / 3,
() - 3,0 / 3.

500-200,0 / 3,
(2).
3 -

200 300 600 ,

	, 0	, 0	, 0
9	17	17	7
10	21	24	12
11	25	36	20
12	29	40	28
13	32	40	33
14	39	41	36
15	37	52	38
16	34	49	39
17	28	45	39
18	24	40	37
19	20	35	32



1-

, 2-

, 3 -

3 -

200 300 600

3.

0 , 52-53 200 300 600 . :
 28-27 ° 400- 370 / ° ,
 69-68 ° -400 / ° , -200 / ° ,
 1000-950 . [3]. - 9+4,5 / ° ,
 -60 / ° .

15-20%

0 , 52-53 18-15 ° .
 69-68 ° .

1000-950 . .

(4)

43-45⁰ () 44-46⁰ ().

- 48-51⁰

44-46⁰ ,
30-35⁰ ,

25-27⁰

812-869 ,

10-15% ,

1 .

12 .

12-15% ,

[4].

4 -

	-		-
1	51	32	973
1'	49	30	955
2	49	35	982
2'	47	34	954
3	47	34	950
3'	47	33	947
4	54	36	
- 36 , 25			

50-70 % R₂₈

5-7⁰ / ,

60-70⁰ - 5-7 ,
35-50⁰
1,5-2,5⁰ /

1.
2.

., 1981. - 174 .

//
. - ∴ , 1984. - .20-21.

3. : - .: 1985. -
- 23 .
4. - « » -2003 .-143 .
5. 51263-2008 (« » 51263-1999, IDT)
- « . »

- (50-70% -),

Summary

Solar technology for the direct use of solar energy for thermal treatment of concrete was developed in the Korkyt Ata Kyzylorda State University and favorably compares with the methods of using solar energy abroad. In all countries where the solar technology is applied, it is based on a two-step basis; first one is a solar heating of water or oil, and then the delivering of heated liquid by pipeline for heating concrete or for any other purpose. Inclusion of intermediate coolant into the energy chain significantly reduces technology of performance coefficient (at least at 50-70%), complicates the production line requiring a lot of extra equipment and increases the cost of thermal treatment.