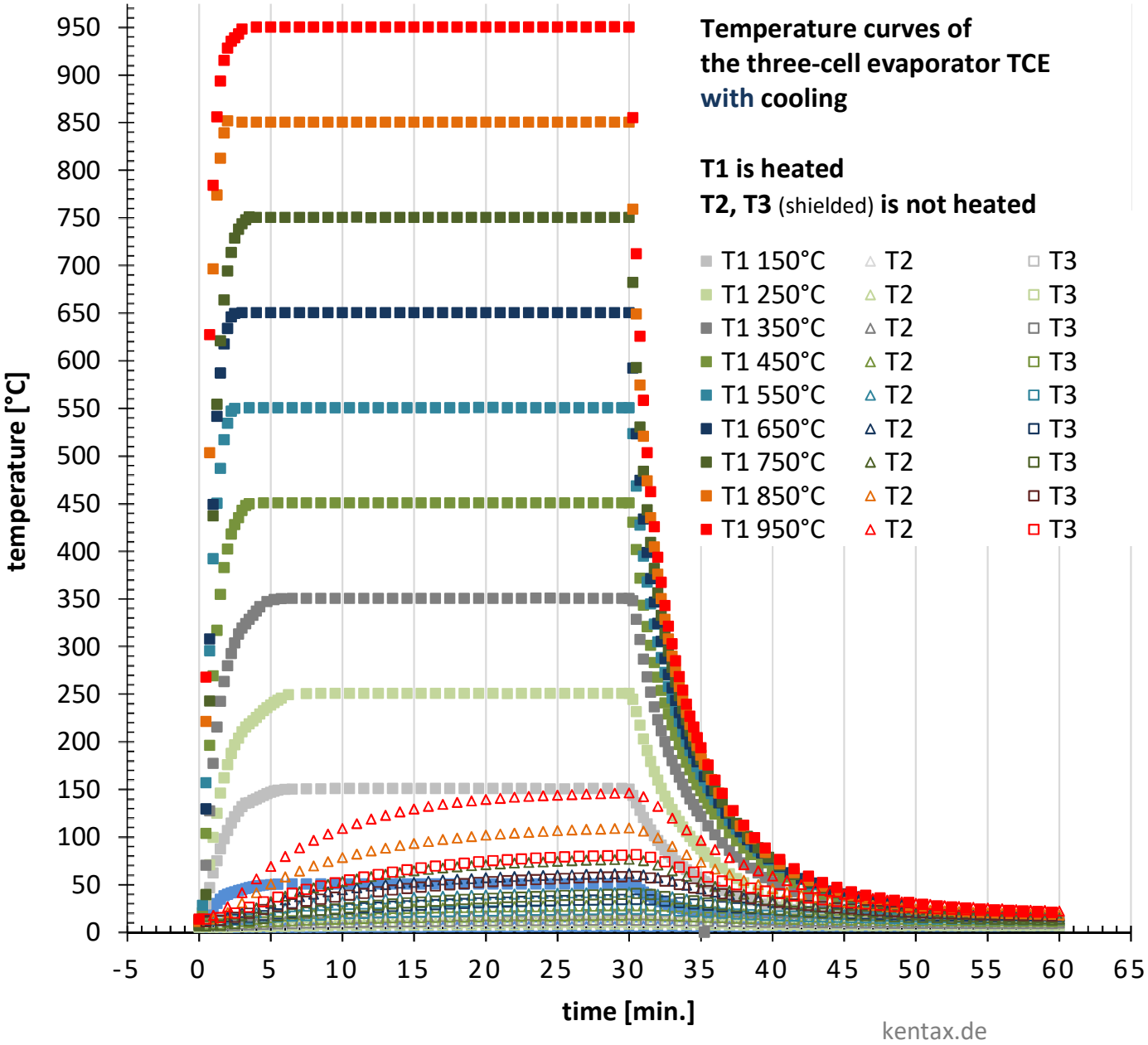
Data sheets - Kentax UHV evaporator TCE-BSC

The following data sheets show temperature curves of one driven heater element whereas the other two elements are not heated but recorded in their temperature. From these diagrams you can see how long a crucible can be heated before the neighboring crucible (with its material) reaches the maximum allowed temperature.

The curves also show that if preparation cycles are finished within 5-10 min, you need not any cooling of the cryostat in most cases of material choice. For example, the neighboring crucible No. 2 rises in temperature to 85 °C if heater No. 1 is heated to 350 °C for 30 minutes without cooling flow (second diagram).
Note: Without cooling, there was still an ongoing increase in temperature a few minutes after heating of the crucible had been stopped.
When using water for cooling you don't have this effect (see first diagram). The typical water cooling flow rate is 100 ml/min.

The power requirement is reduced by the internal shielding (17.7 W at 750 °C, 24 W at 850 °C and 36 W at 950 °C). This version of the three-cell evaporator is recommended when high temperatures are frequently used.


Temperature curves of
the three-cell evaporator TCE
with cooling
T1 is heated
T2, T3 (shielded) is not heated
T1 150°C
T1 250°C
T1 350°C
T1 450°C
T1 550°C
T1 650°C
T1 750°C
T1 850°C
T1 950°C
T2
T3
temperature [°C]
time [min.]
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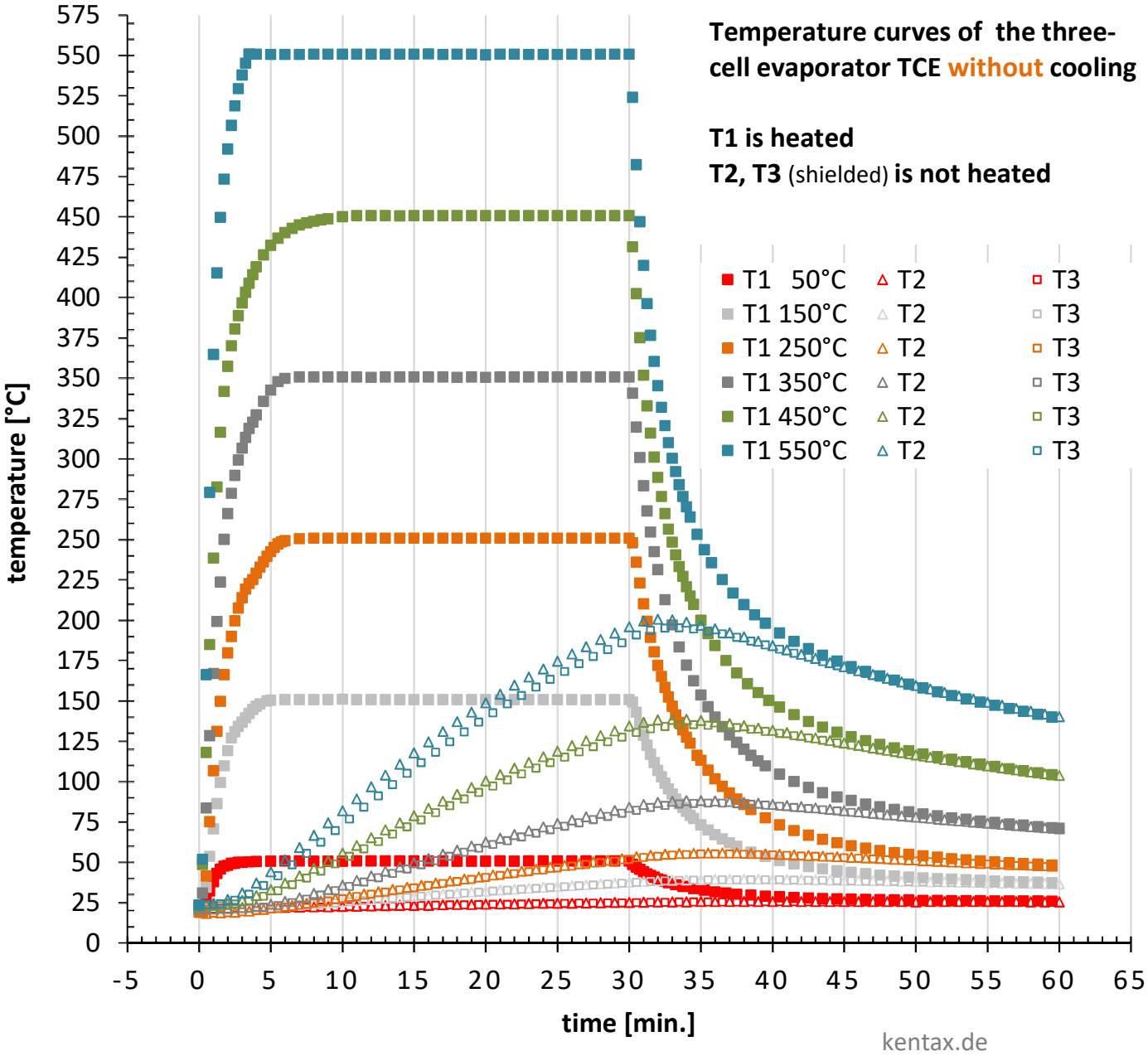
Temperature curves of the three-cell evaporator TCE without cooling
T1 is heated
T2, T3 (shielded) is not heated
T1 50°C
T1 150°C
T1 250°C
T1 350°C
T1 450°C
T1 550°C
T2
T3
temperature [°C]
time [min.]
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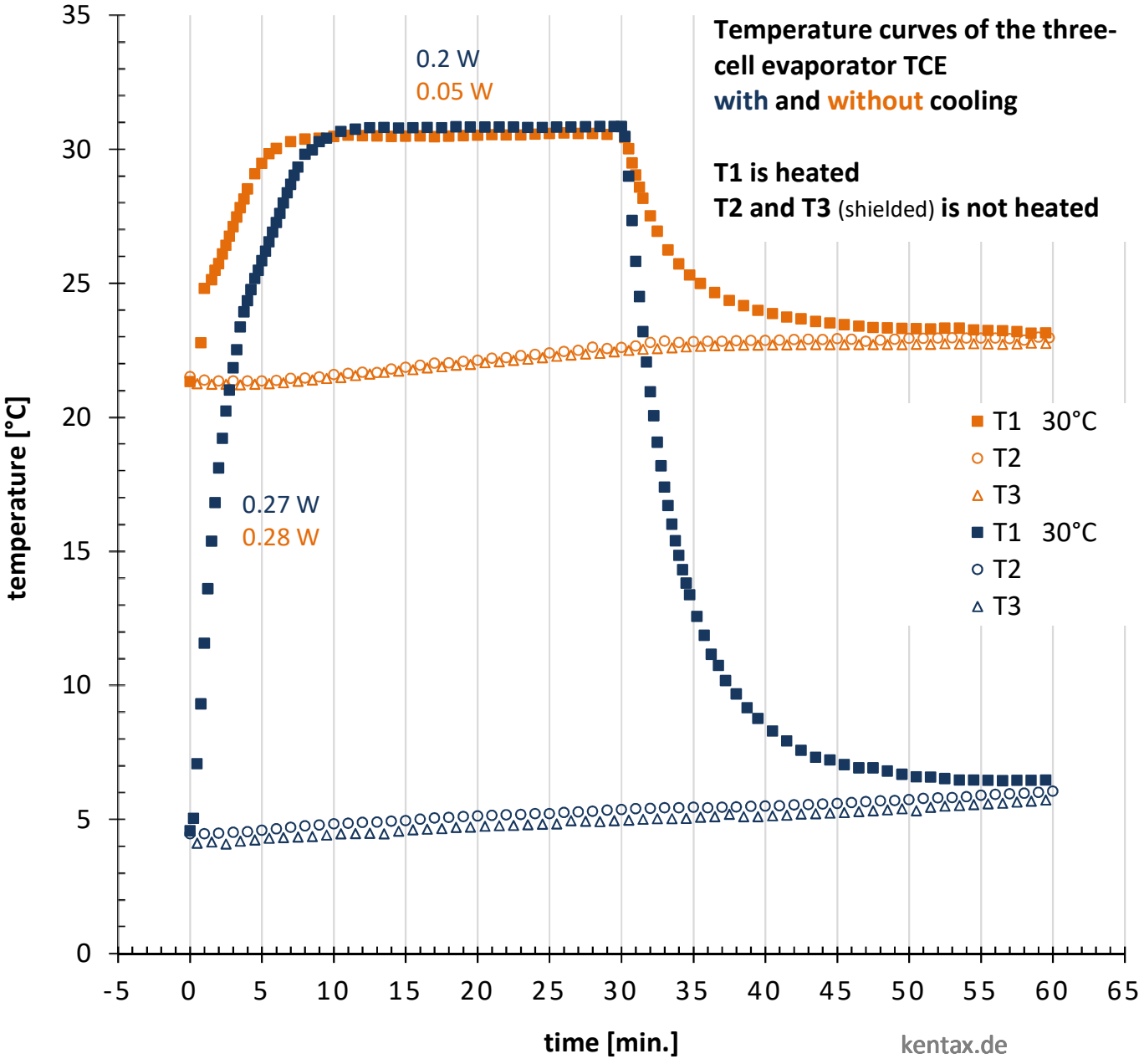
Temperature curves of the three-cell evaporator TCE
with and without cooling
T1 is heated
T2 and T3 (shielded) is not heated
0.2 W
0.05 W
0.27 W
0.28 W
T1 30°C
T2
T3
T1 30°C
T2
T3
temperature [°C]
time [min.]
35
30
25
20
15
10
5
0
-5
0
5
10
15
20
25
30
35
40
45
50
55
60
65
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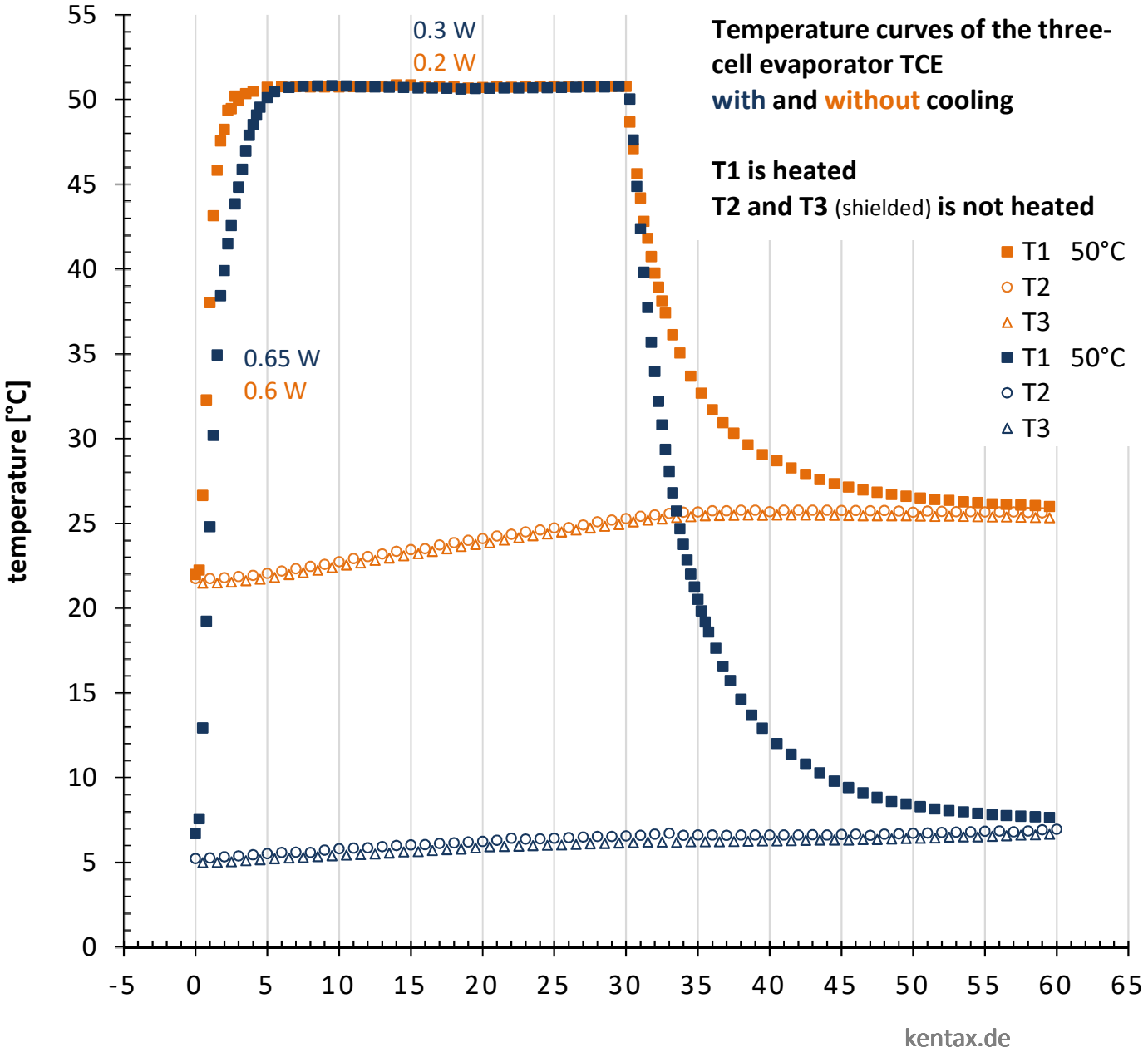
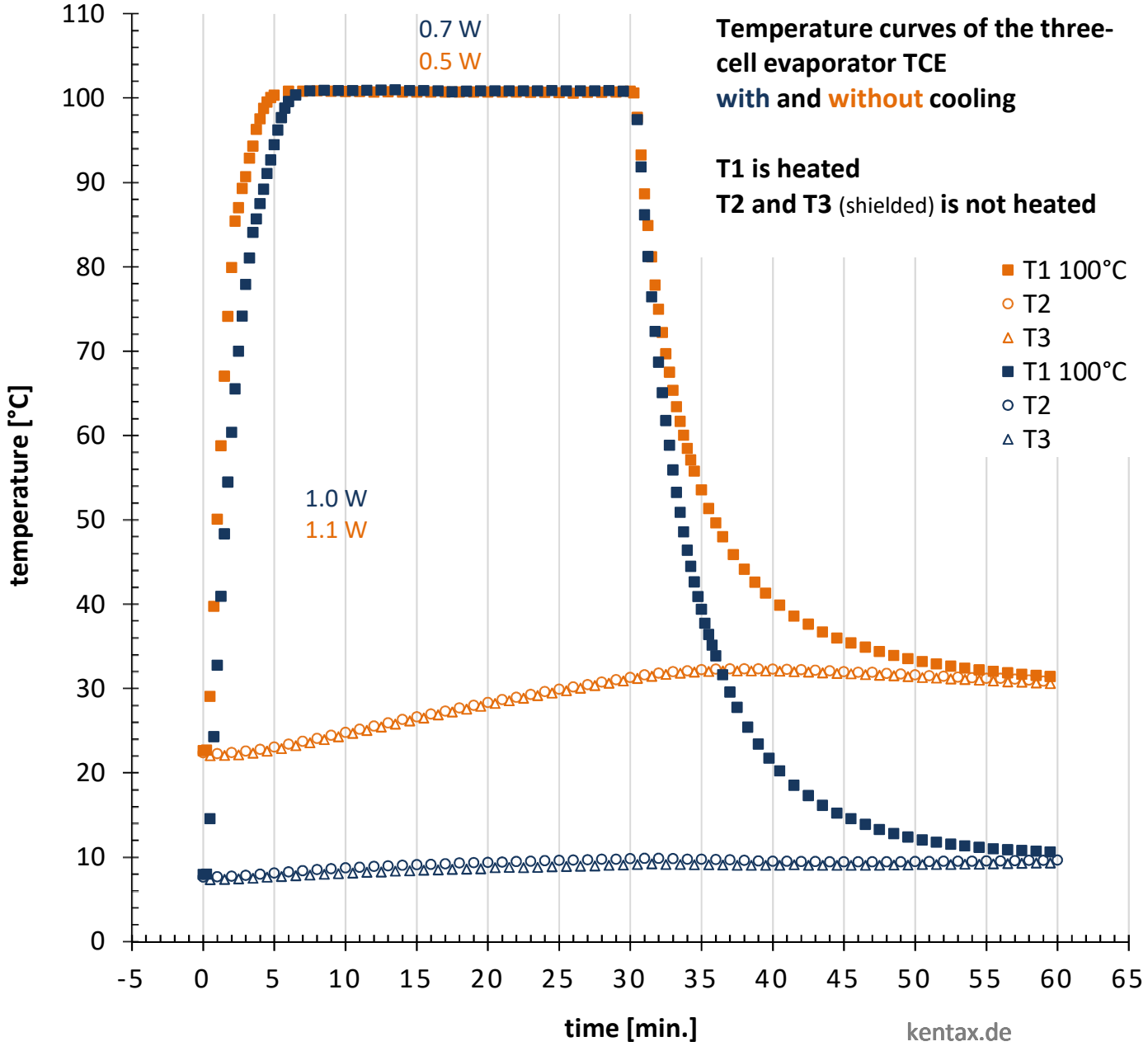

Temperature curves of the three-cell evaporator TCE
with and without cooling
T1 is heated
T2 and T3 (shielded) is not heated
T1 50°C
T2
T3
T1 50°C
T2
T3
0.3 W
0.2 W
0.65 W
0.6 W
temperature [°C]
55
50
45
40
35
30
25
20
15
10
5
0
-5
0
5
10
15
20
25
30
35
40
45
50
55
60
65
kentax.de


Temperature curves of the three-cell evaporator TCE
with and without cooling
T1 is heated
T2 and T3 (shielded) is not heated
0.7 W
0.5 W
1.0 W
1.1 W
T1 100°C
T2
T3
T1 100°C
T2
T3
temperature [°C]
time [min.]
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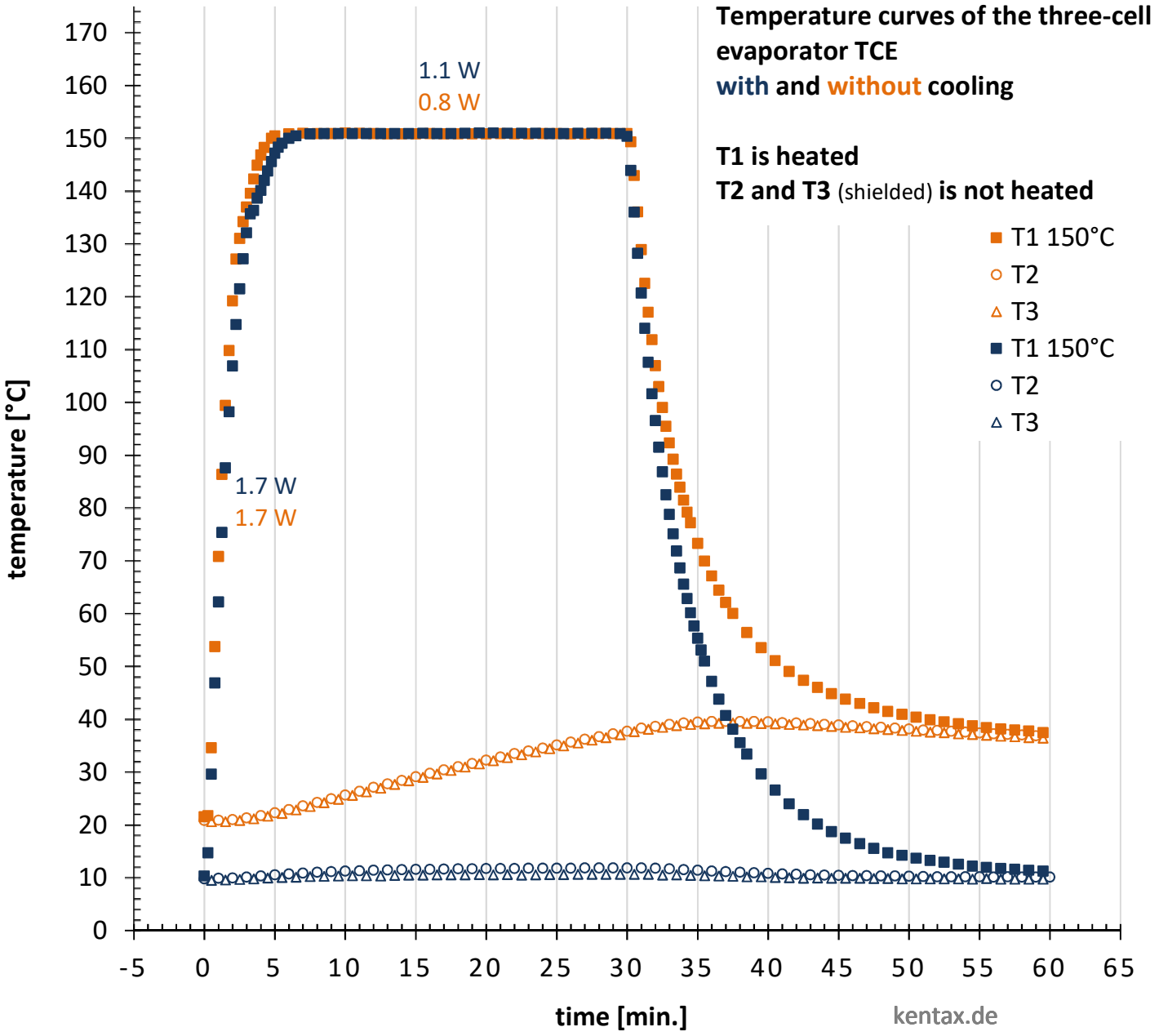
Temperature curves of the three-cell evaporator TCE
with and without cooling
T1 is heated
T2 and T3 (shielded) is not heated
T1 150°C
T2
T3
T1 150°C
T2
T3
1.1 W
0.8 W
1.7 W
1.7 W
temperature [°C]
time [min.]
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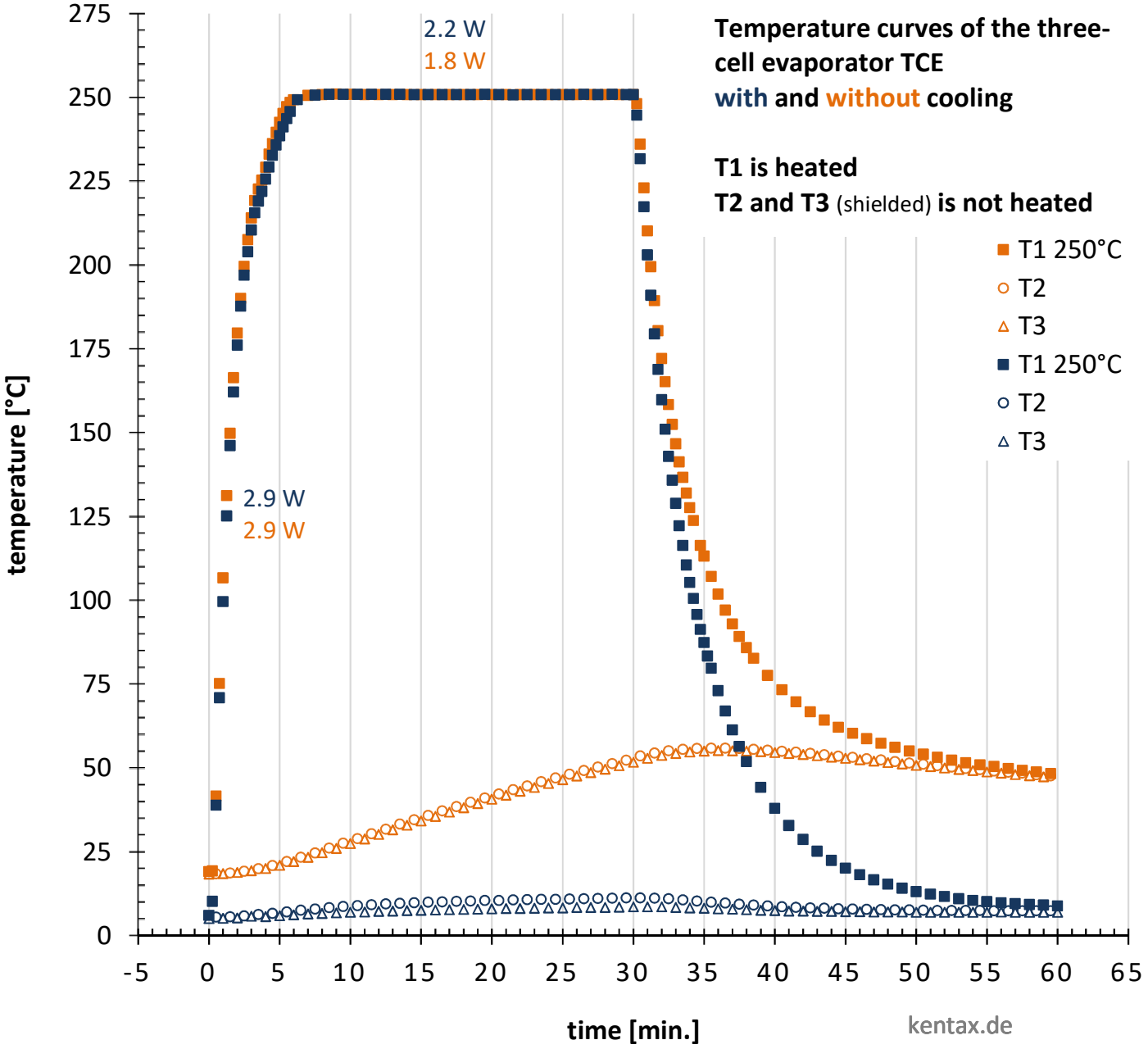
Temperature curves of the three-cell evaporator TCE
with and without cooling
T1 is heated
T2 and T3 (shielded) is not heated
2.2 W
1.8 W
2.9 W
2.9 W
T1 250°C
T2
T3
T1 250°C
T2
T3
temperature [°C]
time [min.]
275
250
225
200
175
150
125
100
75
50
25
0
-5
0
5
10
15
20
25
30
35
40
45
50
55
60
65
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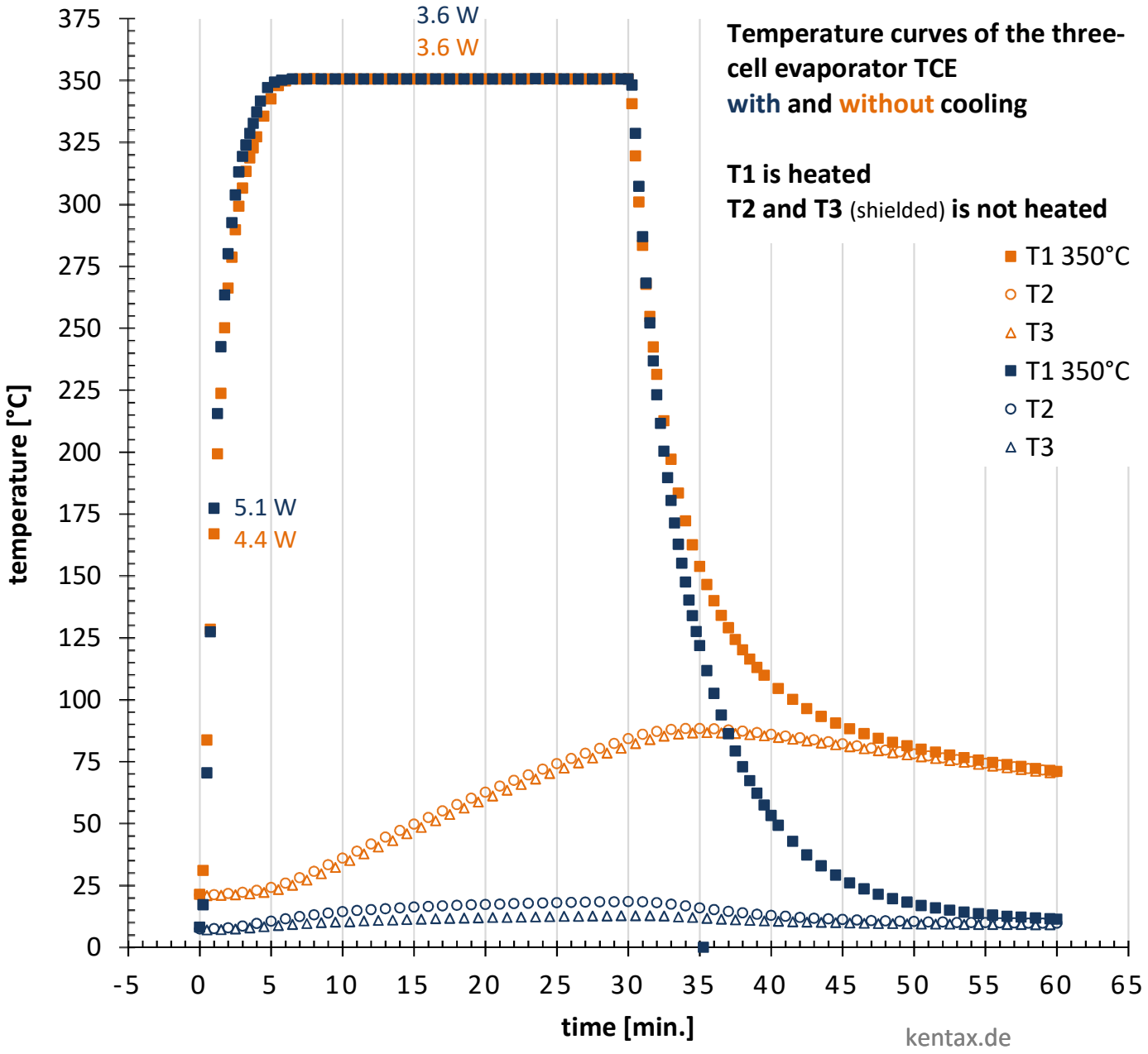
Temperature curves of the three-cell evaporator TCE
with and without cooling
T1 is heated
T2 and T3 (shielded) is not heated
T1 350°C
T2
T3
T1 350°C
T2
T3
3.6 W
3.6 W
5.1 W
4.4 W
temperature [°C]
time [min.]
375
350
325
300
275
250
225
200
175
150
125
100
75
50
25
0
-5
0
5
10
15
20
25
30
35
40
45
50
55
60
65
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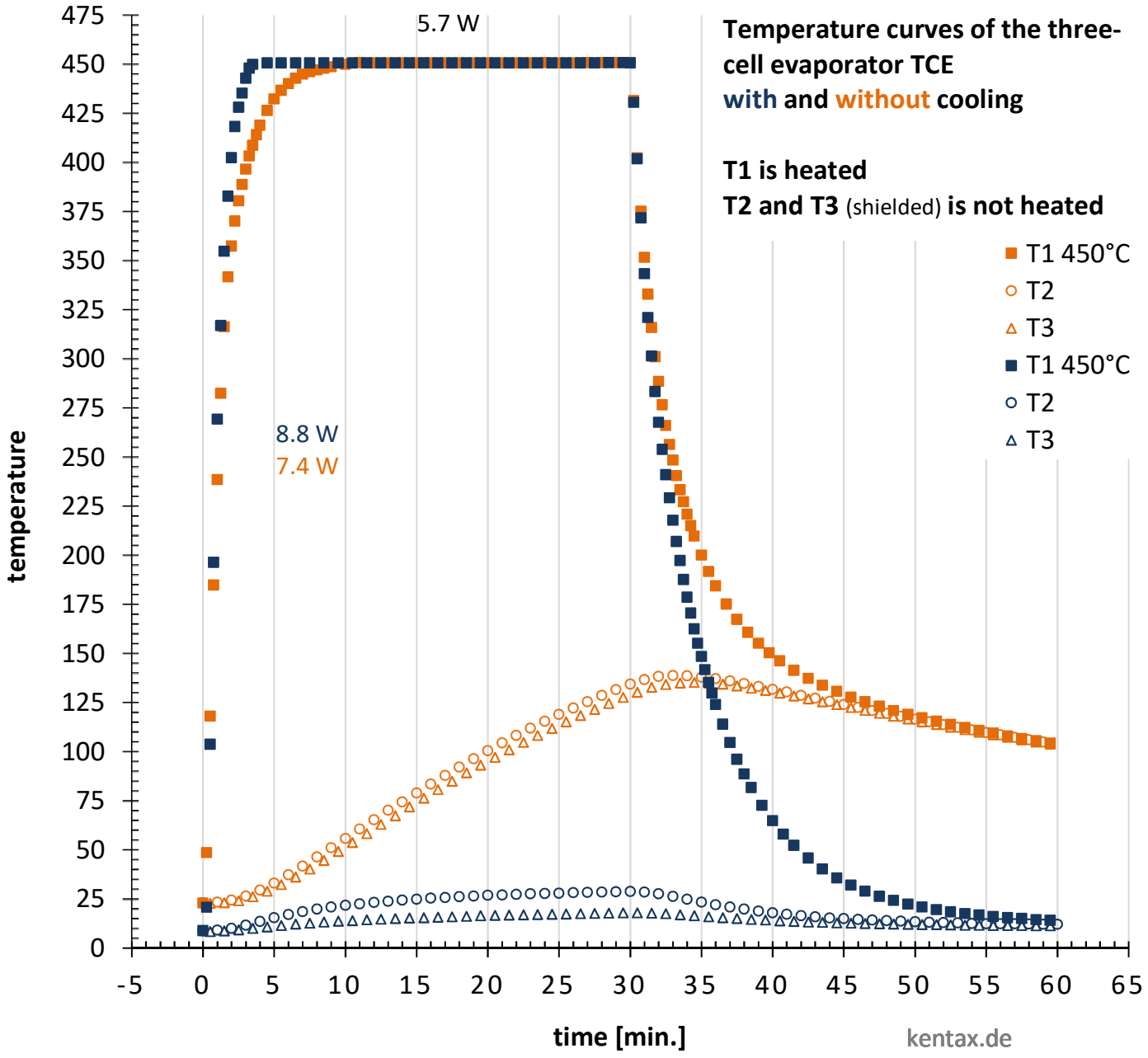
Temperature curves of the three-cell evaporator TCE
with and without cooling
T1 is heated
T2 and T3 (shielded) is not heated
T1 450°C
T2
T3
T1 450°C
T2
T3
5.7 W
8.8 W
7.4 W
temperature
time [min.]
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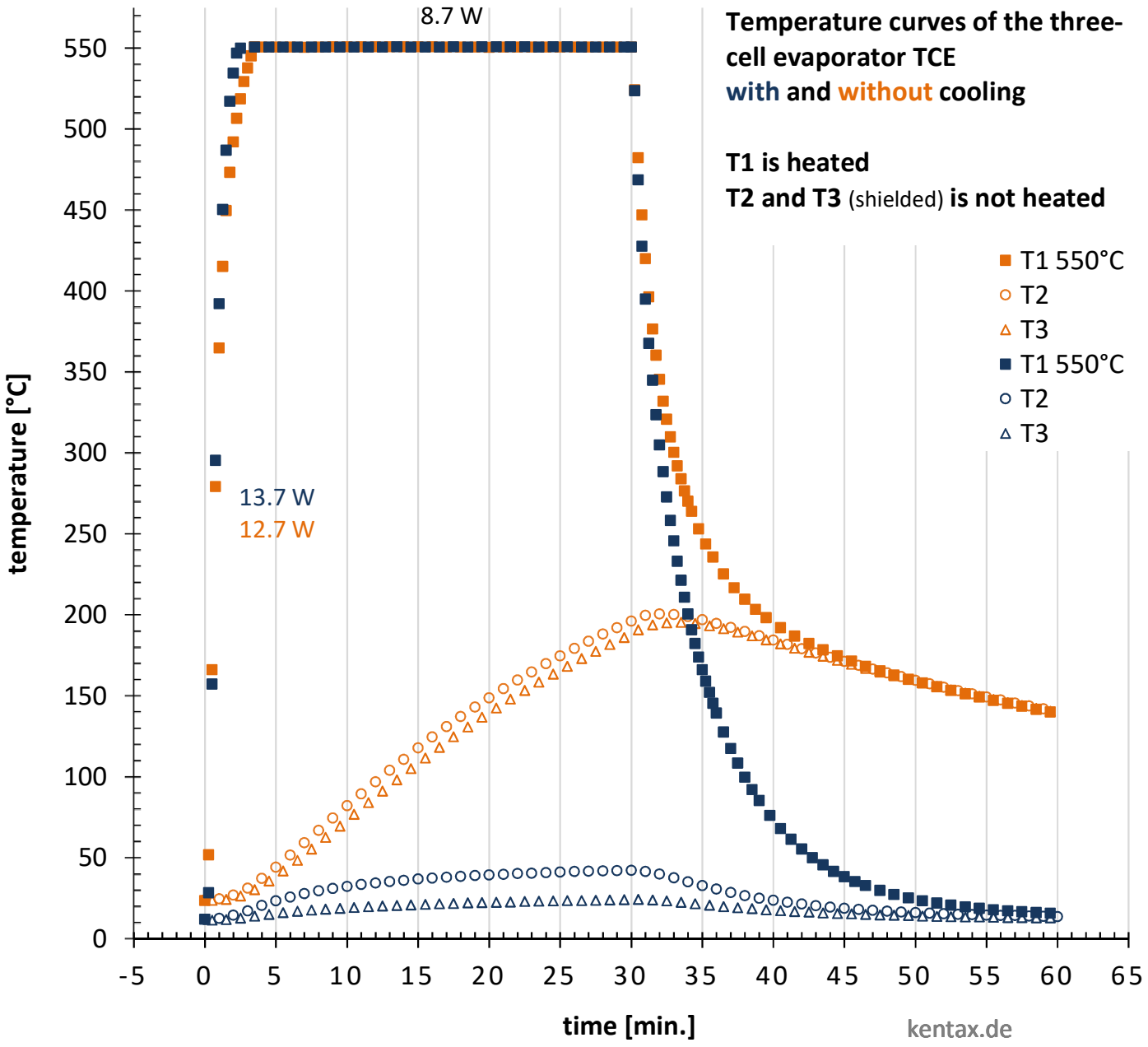
Temperature curves of the three-cell evaporator TCE
with and without cooling
T1 is heated
T2 and T3 (shielded) is not heated
8.7 W
13.7 W
12.7 W
T1 550°C
T2
T3
T1 550°C
T2
T3
temperature [°C]
time [min.]
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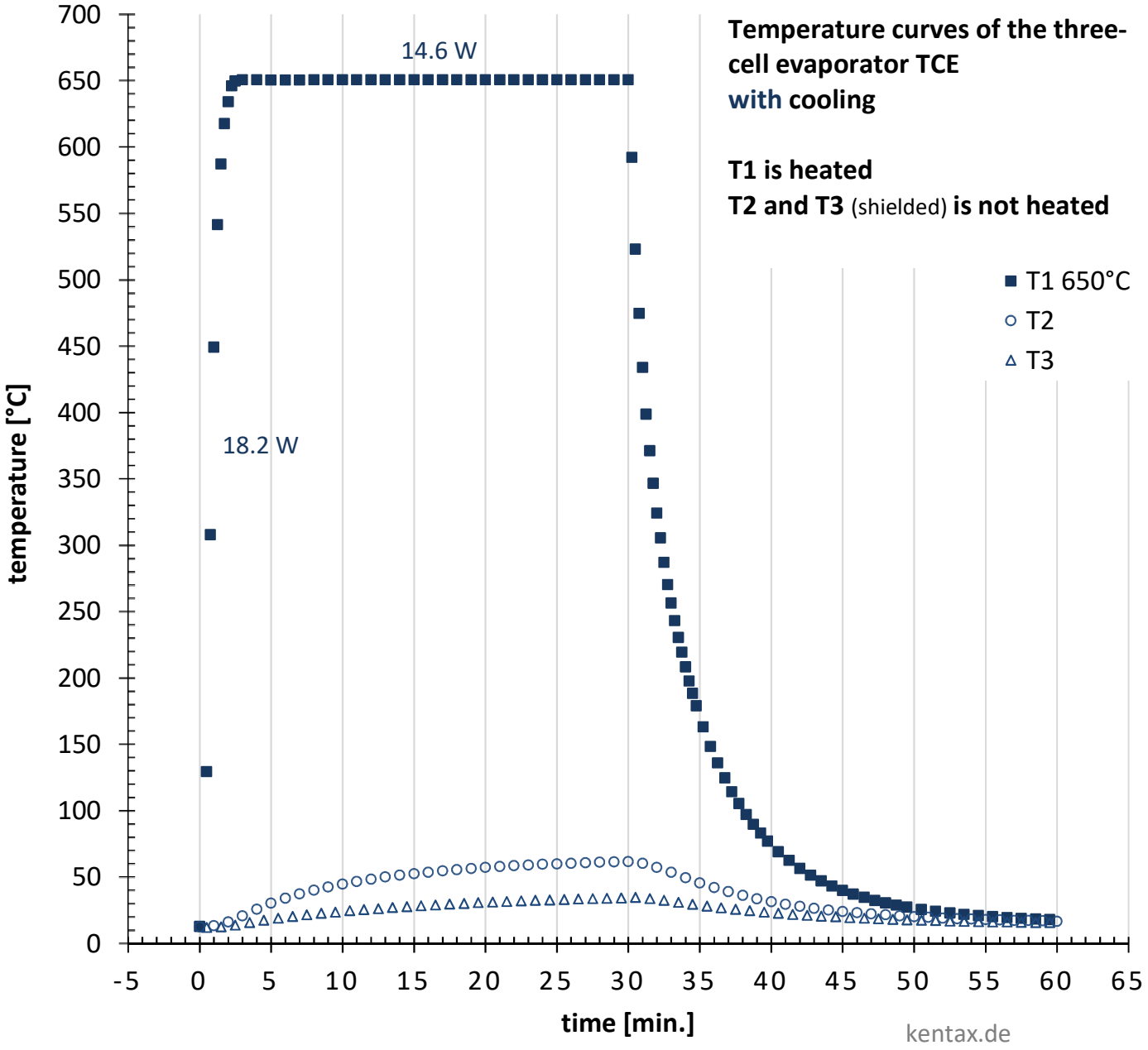
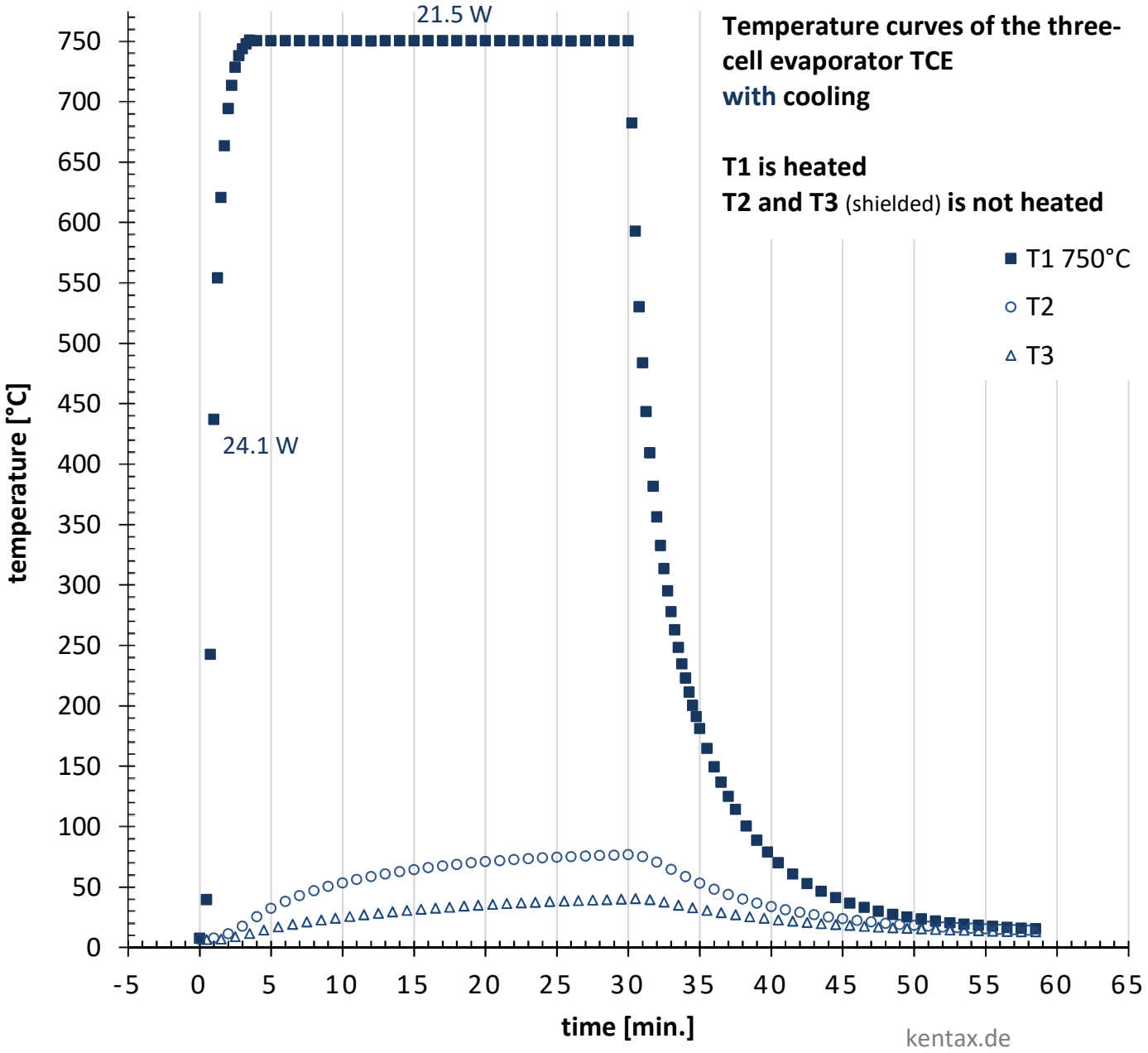
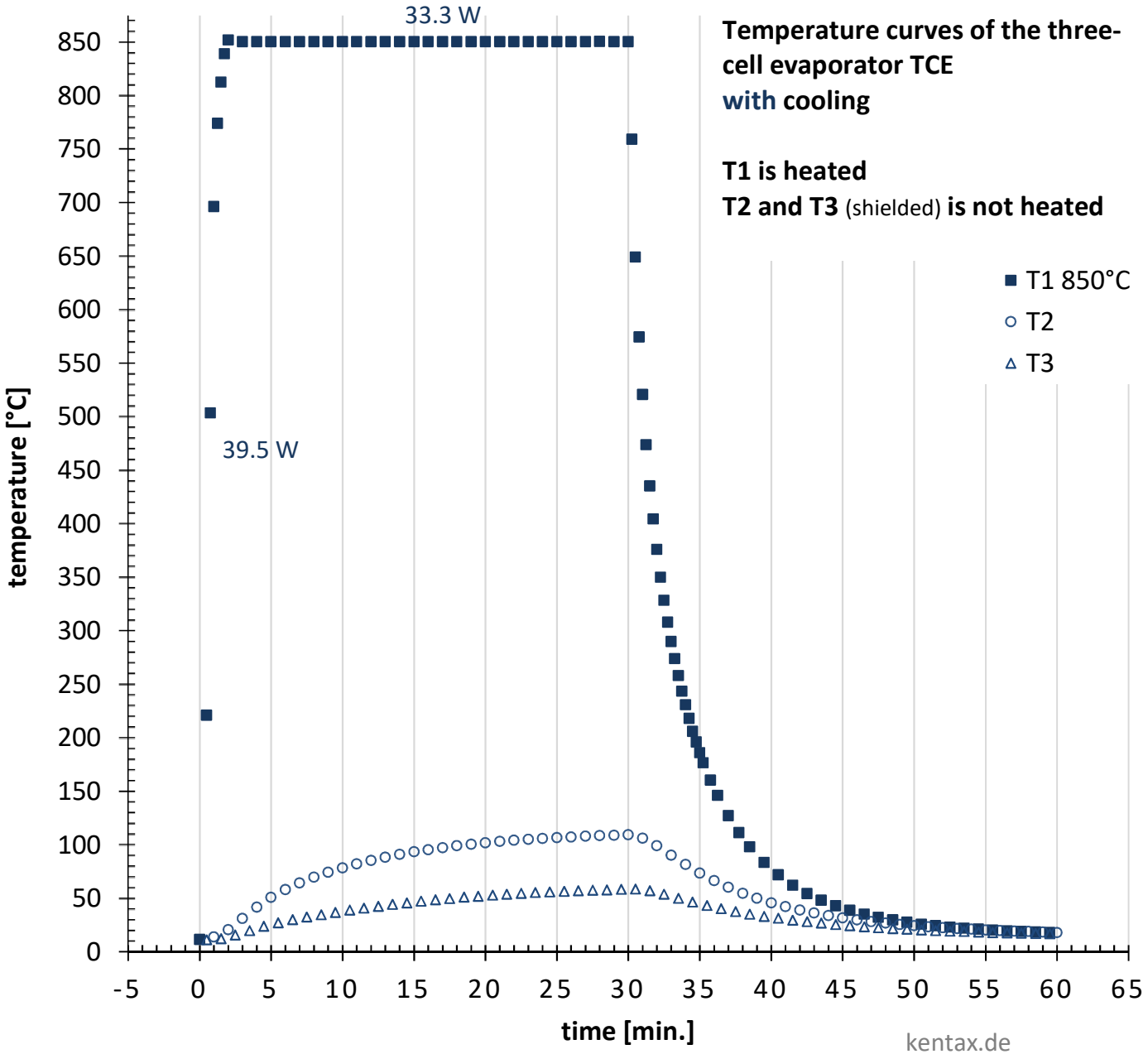

Temperature curves of the three-cell evaporator TCE
with cooling
T1 is heated
T2 and T3 (shielded) is not heated
T1 650°C
T2
T3
14.6 W
18.2 W
temperature [°C]
time [min.]
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
-5
0
5
10
15
20
25
30
35
40
45
50
55
60
65
kentax.de


Temperature curves of the three-cell evaporator TCE
with cooling
T1 is heated
T2 and T3 (shielded) is not heated
T1 750°C
T2
T3
21.5 W
24.1 W
temperature [°C]
time [min.]
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
-5
0
5
10
15
20
25
30
35
40
45
50
55
60
65
kentax.de


Temperature curves of the three-cell evaporator TCE
with cooling
T1 is heated
T2 and T3 (shielded) is not heated
T1 850°C
T2
T3
33.3 W
39.5 W
temperature [°C]
time [min.]
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
-5
0
5
10
15
20
25
30
35
40
45
50
55
60
65
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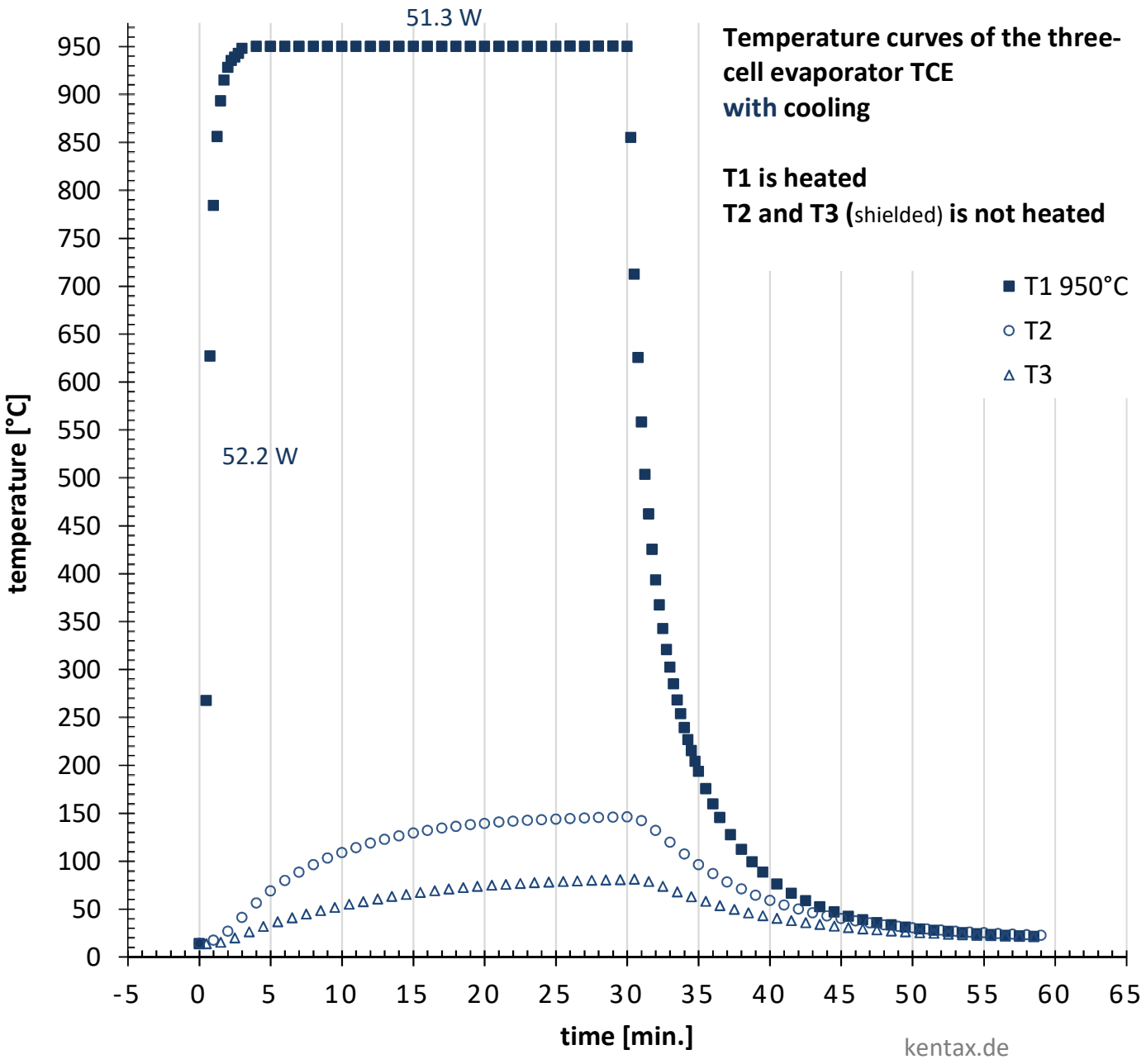
Temperature curves of the three-cell evaporator TCE
with cooling
T1 is heated
T2 and T3 (shielded) is not heated
T1 950°C
T2
T3
51.3 W
52.2 W
temperature [°C]
time [min.]
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