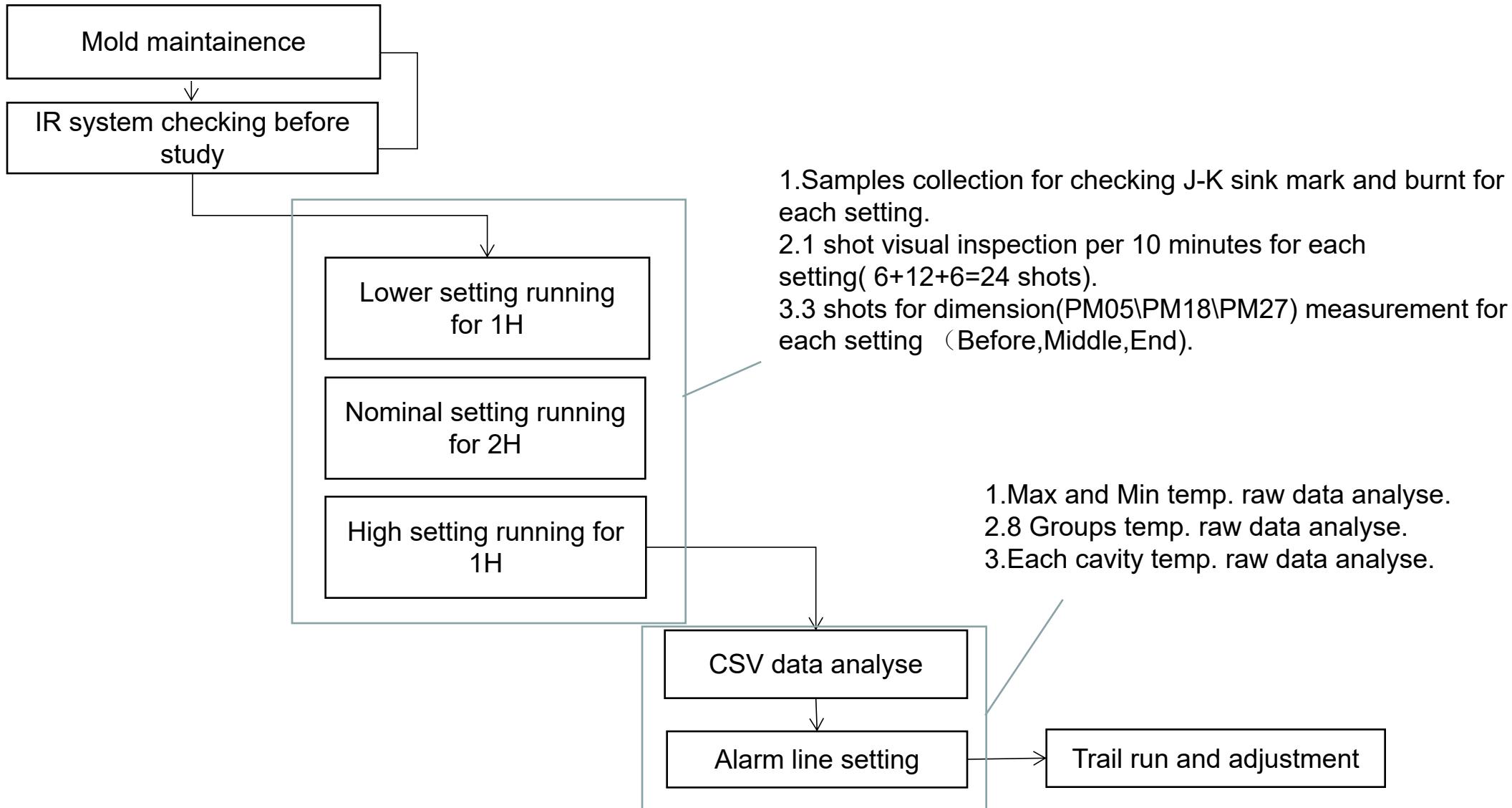


E2G line 29 IR Study for Mornitoring Mold Temperature

Bruce li
11-8-2023

□ IR system study flow chart



Cosmetic inspection for IR study

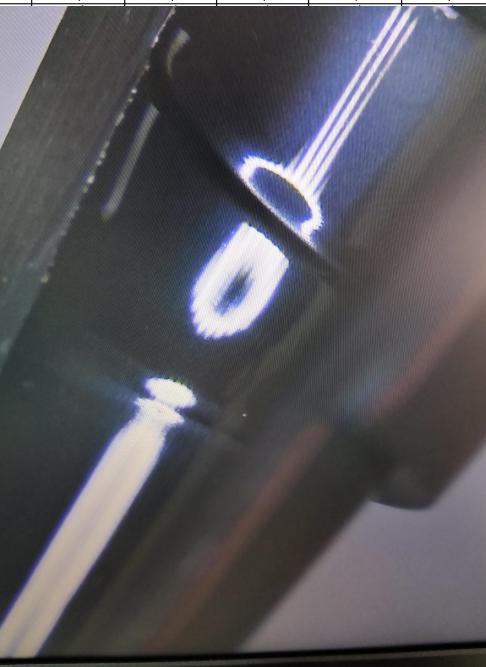
1. Visual inspection for low setting (Total 6 shots)

Cavity No.	Cosmetic inspection for IR study using Low setting											
	1st Shot		2nd Shot		3rd Shot		4th Shot		5th		6th Shot	
	Sink mark (J-K)	Burnt	Sink mark (J-K)	Burnt	Sink mark (J-K)	Burnt	Sink mark (J-K)	Burnt	Sink mark (J-K)	Burnt	Sink mark (J-K)	Burnt
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
9	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
13	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
14	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
15	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
16	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
18	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19
20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
25	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
26	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
27	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
28	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
29	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
30	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
32	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
33	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
34	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
35	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
36	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
37	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
38	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
39	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
40	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
41	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
42	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
43	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
44	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
45	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
46	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
47	x	✓	x	✓	x	✓	x	✓	x	✓	x	✓
48	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
49	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
50	x	✓	x	✓	x	✓	x	✓	x	✓	x	✓
51	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
52	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
53	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
54	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
55	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
56	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
57	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
58	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
59	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
60	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
61	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
62	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
63	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
64	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

There cavities 47# and 50# happened sink mark on j-k surface.

Cosmetic inspection for IR study

2. Visual inspection for nominal setting (Total 12 shots)



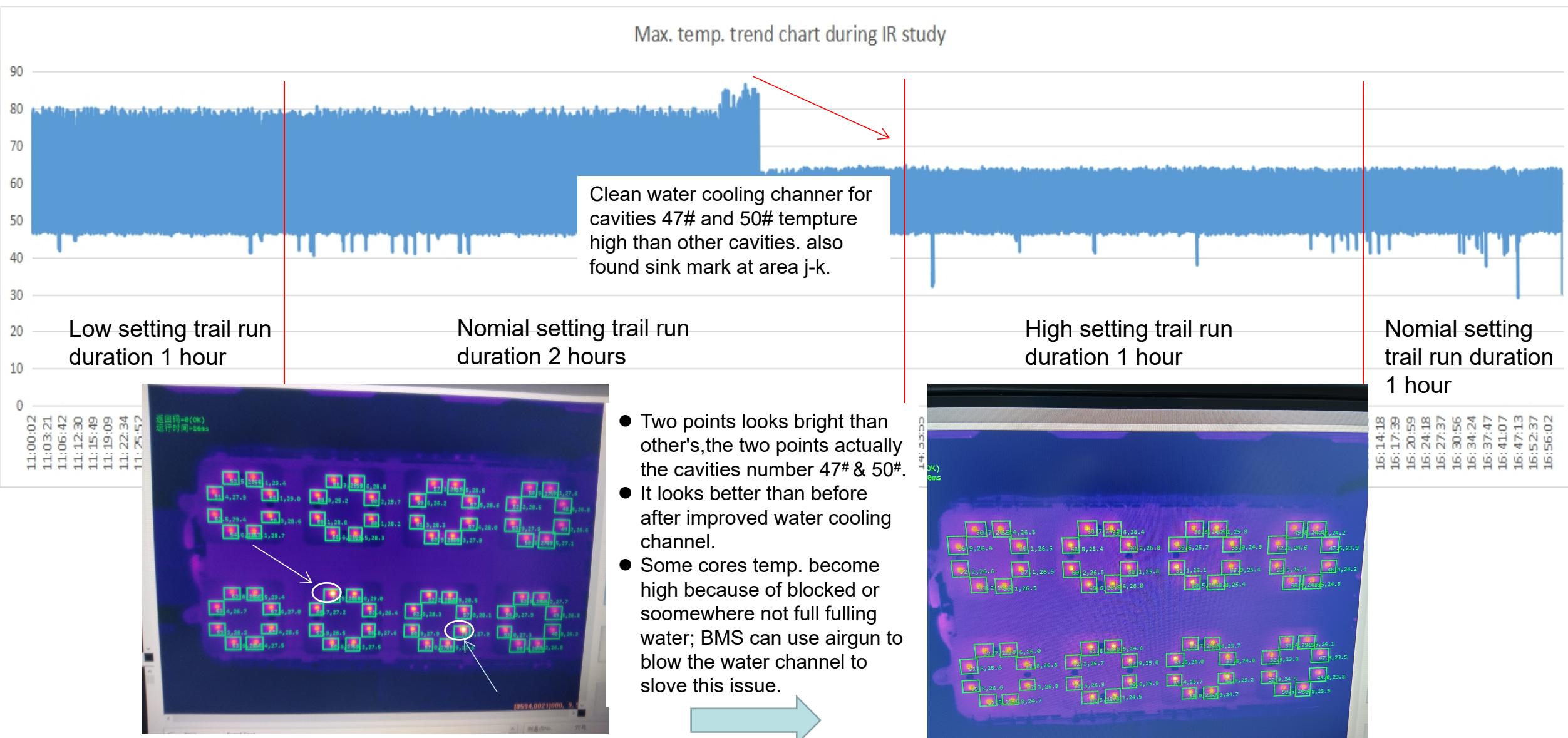
Sink mark defect have been improved after clean water cooling channel.

Cosmetic inspection for IR study

3. Visual inspection for high setting (Total 6 shots)

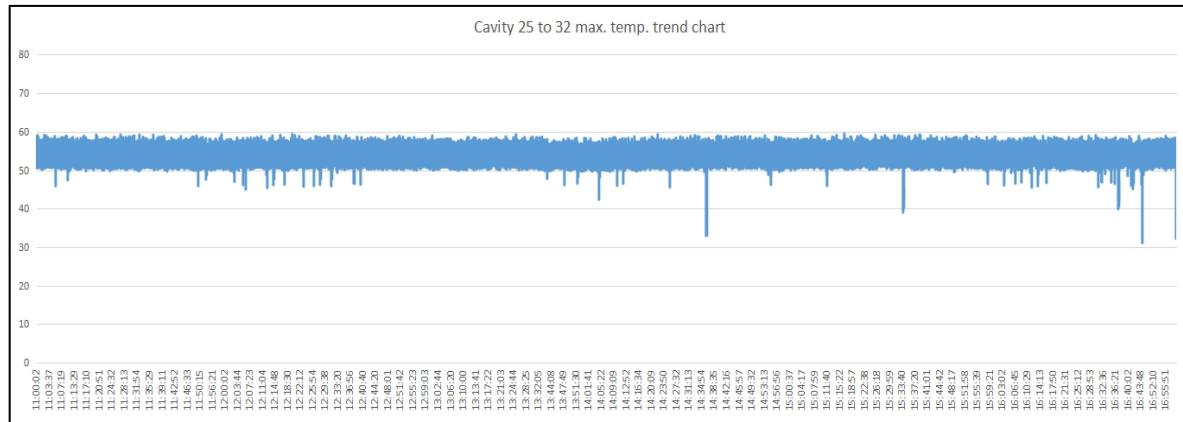
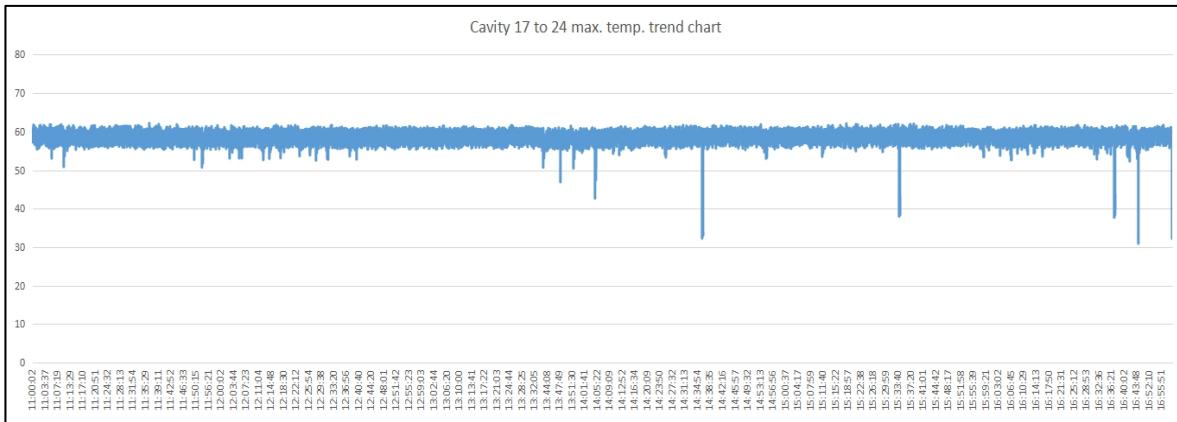
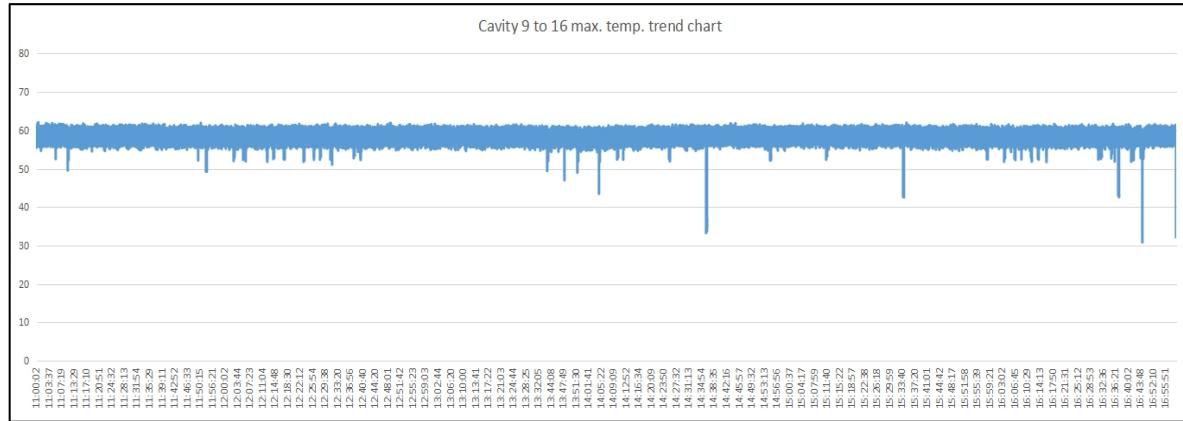
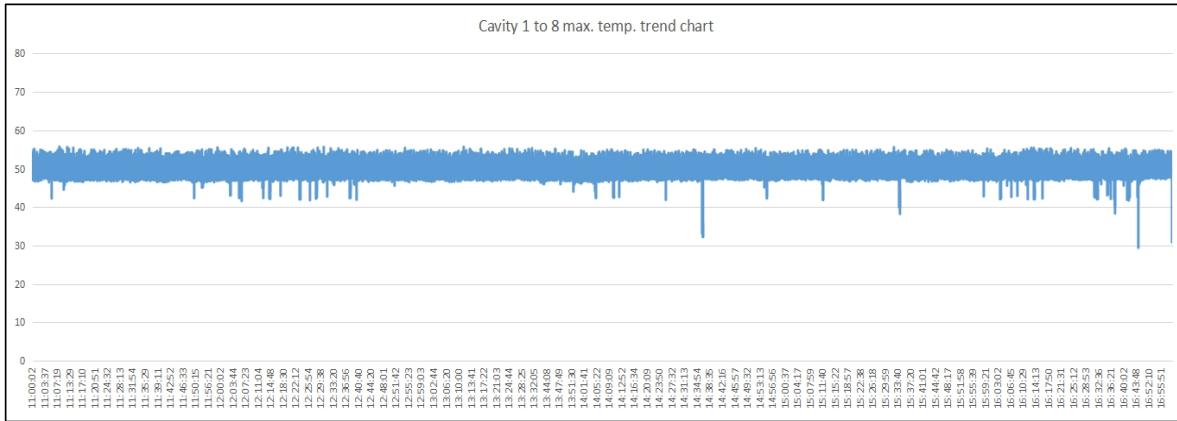
CSV data analyse for IR study

1. Max temp. raw data analyse.



CSV data analyse for IR study

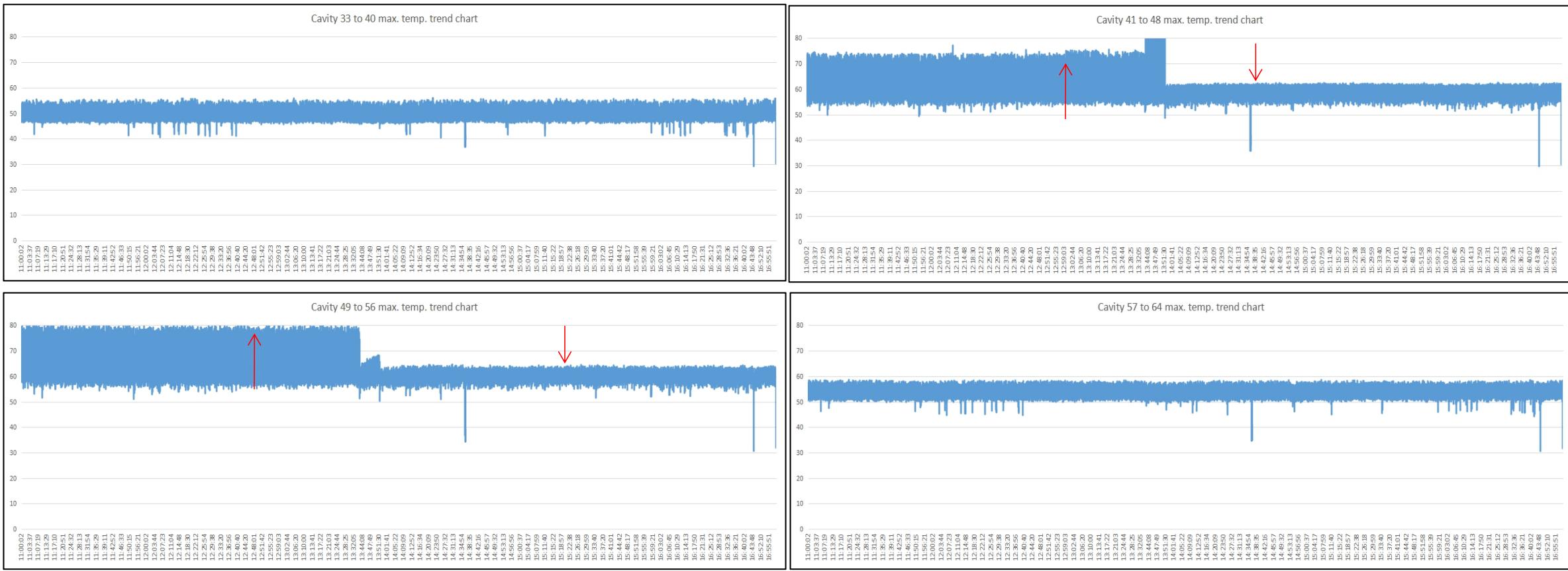
2.8 Groups temp. raw data analyse.



There max.temperature is stable for each group 1 to 4.

CSV data analyse for IR study

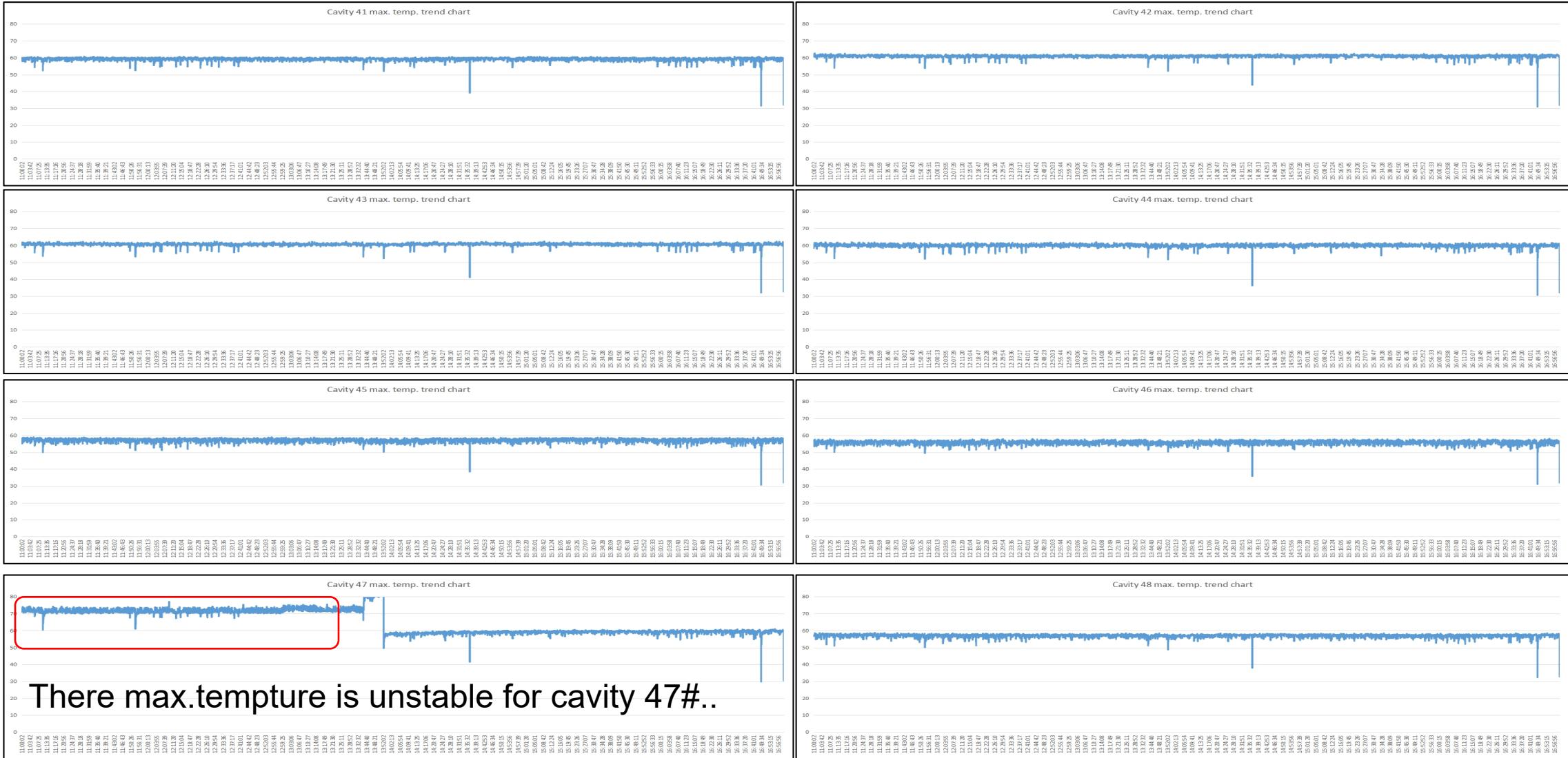
2.8 Groups temp. raw data analyse.



There max.temperature is unstable for group (cavity 41-48) and group (cavity 49-56)..

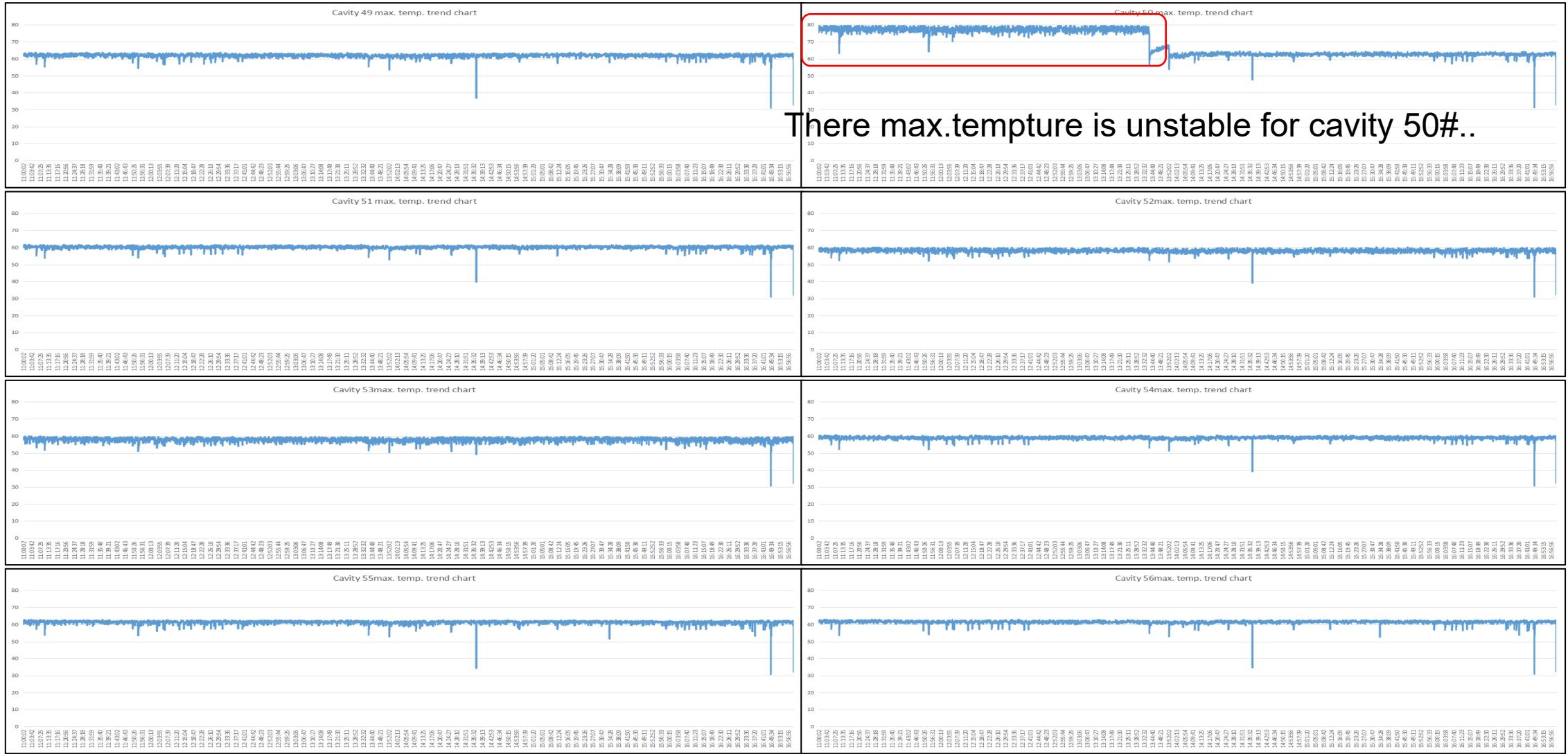
CSV data analyse for IR study

2.Cavities 41# to 48# max. temp. raw data analyse.



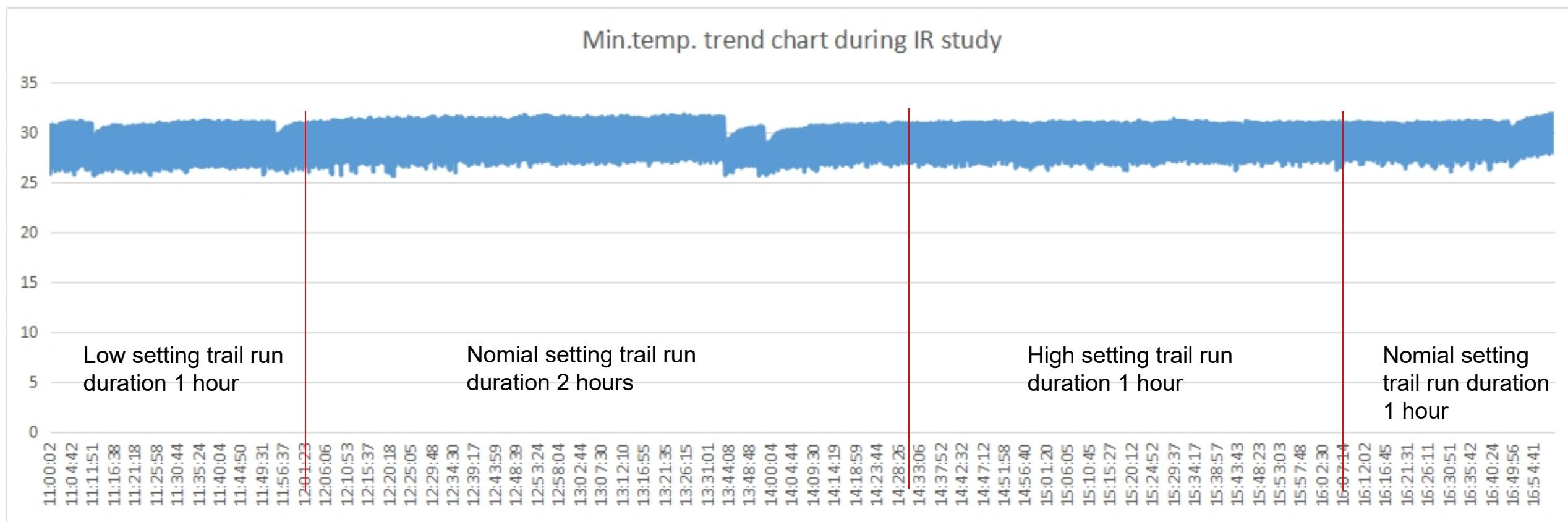
CSV data analyse for IR study

2.Cavities 49# to 56# max. temp. raw data analyse.



CSV data analyse for IR study

3. Min temp. raw data analyse.

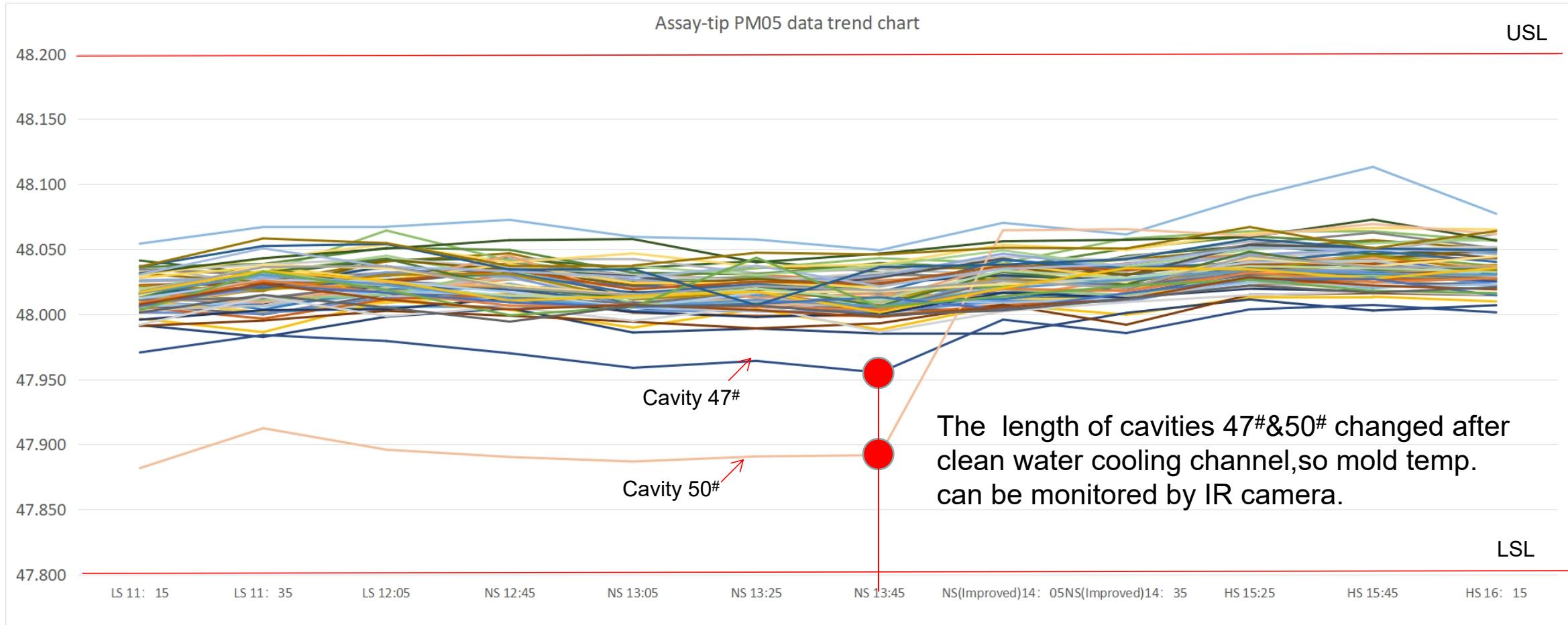


No significant change for min. temperature during IR study.

Dimension measurement for IR study

3 shots for dimension(PM05\PM18\PM27) measurement for each setting.

➤ 3 shots trend chart for PM05 for each setting.



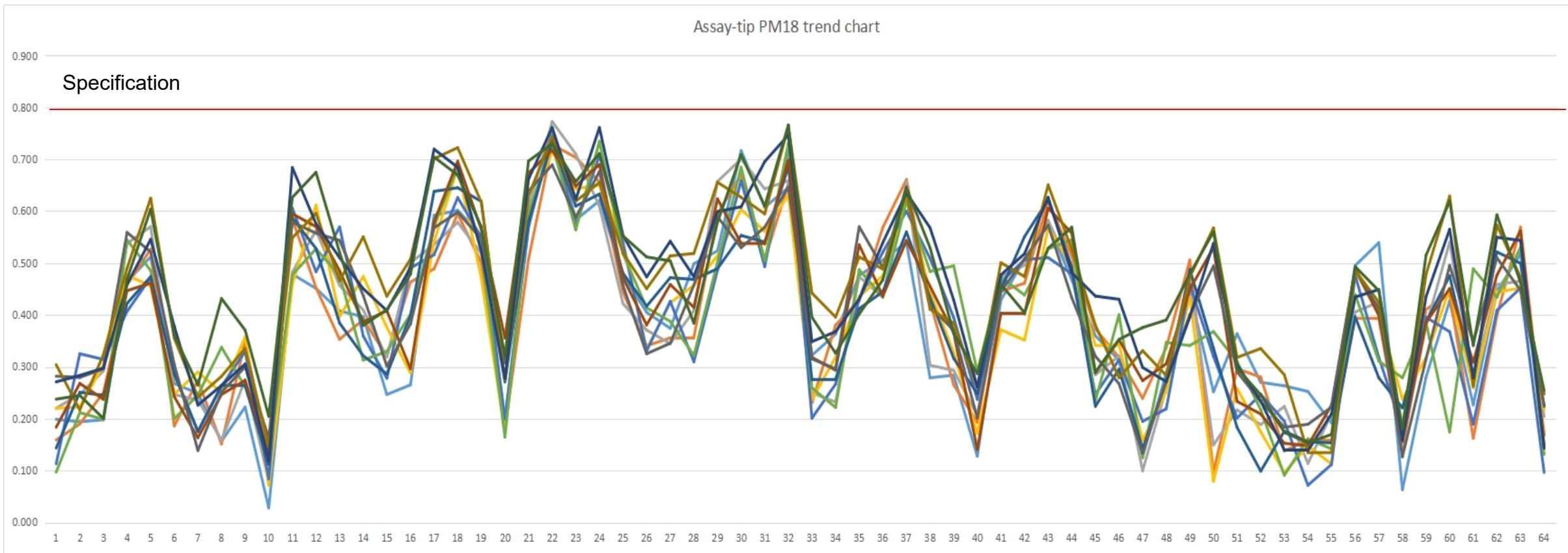
Note:

- LS means lower setting;
- NS means nominal setting;
- HS means high setting.

Dimension measurement for IR study

3 shots for dimension(PM05\PM18\PM27) measurement for each setting.

- 3 shots trend chart for PM18 for each setting.

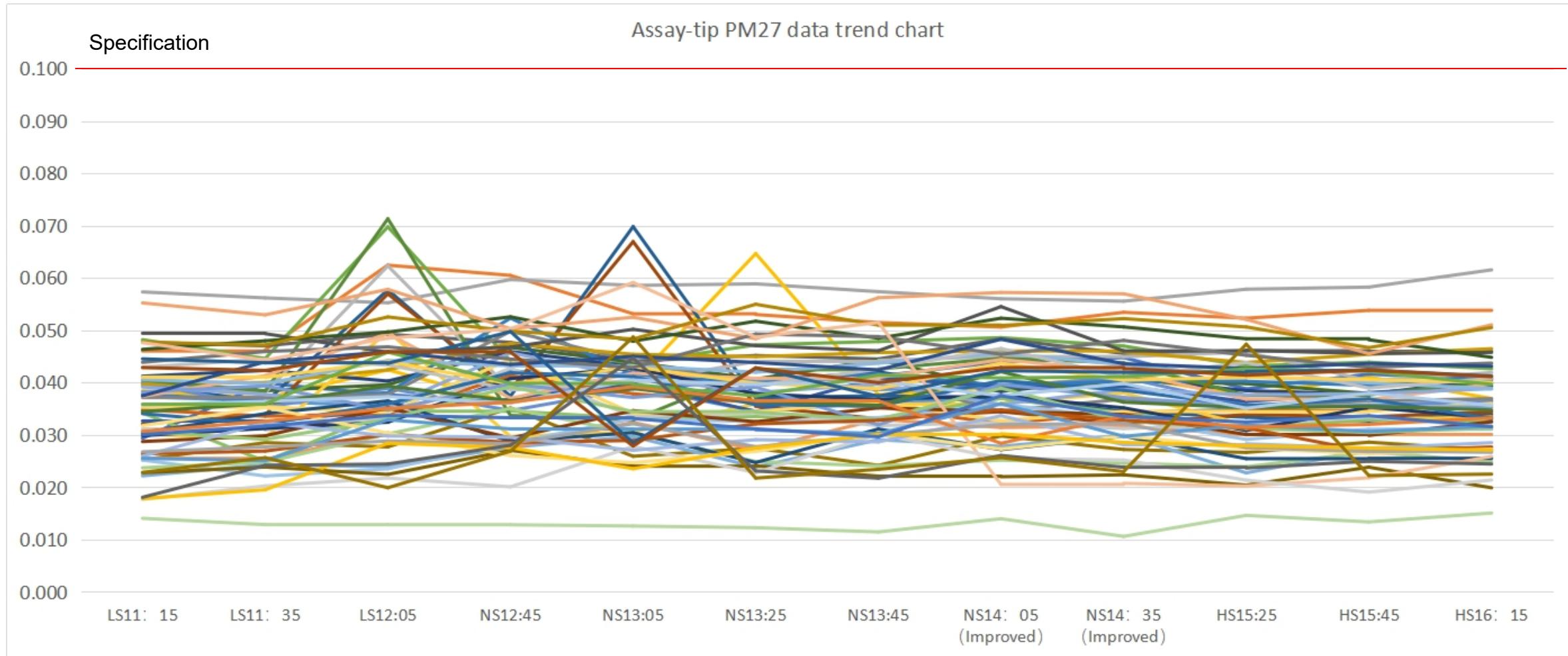


It seems no significant impact to PM18 (runout) when mold temp. changing from this IR study.

Dimension measurement for IR study

3 shots for dimension(PM05\PM18\PM27) measurement for each setting.

➤ 3 shots trend chart for PM27 for each setting.



Note:

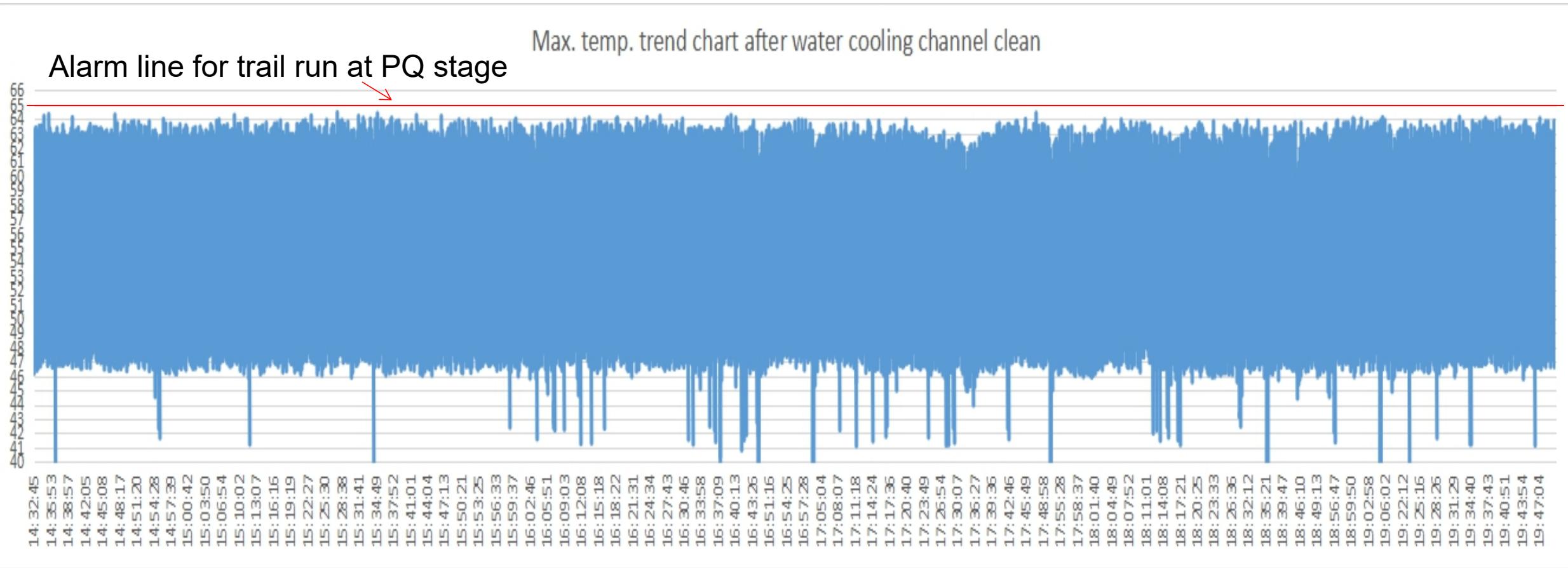
-LS means lower setting;

-NS means nominal setting;

-HS means high setting.

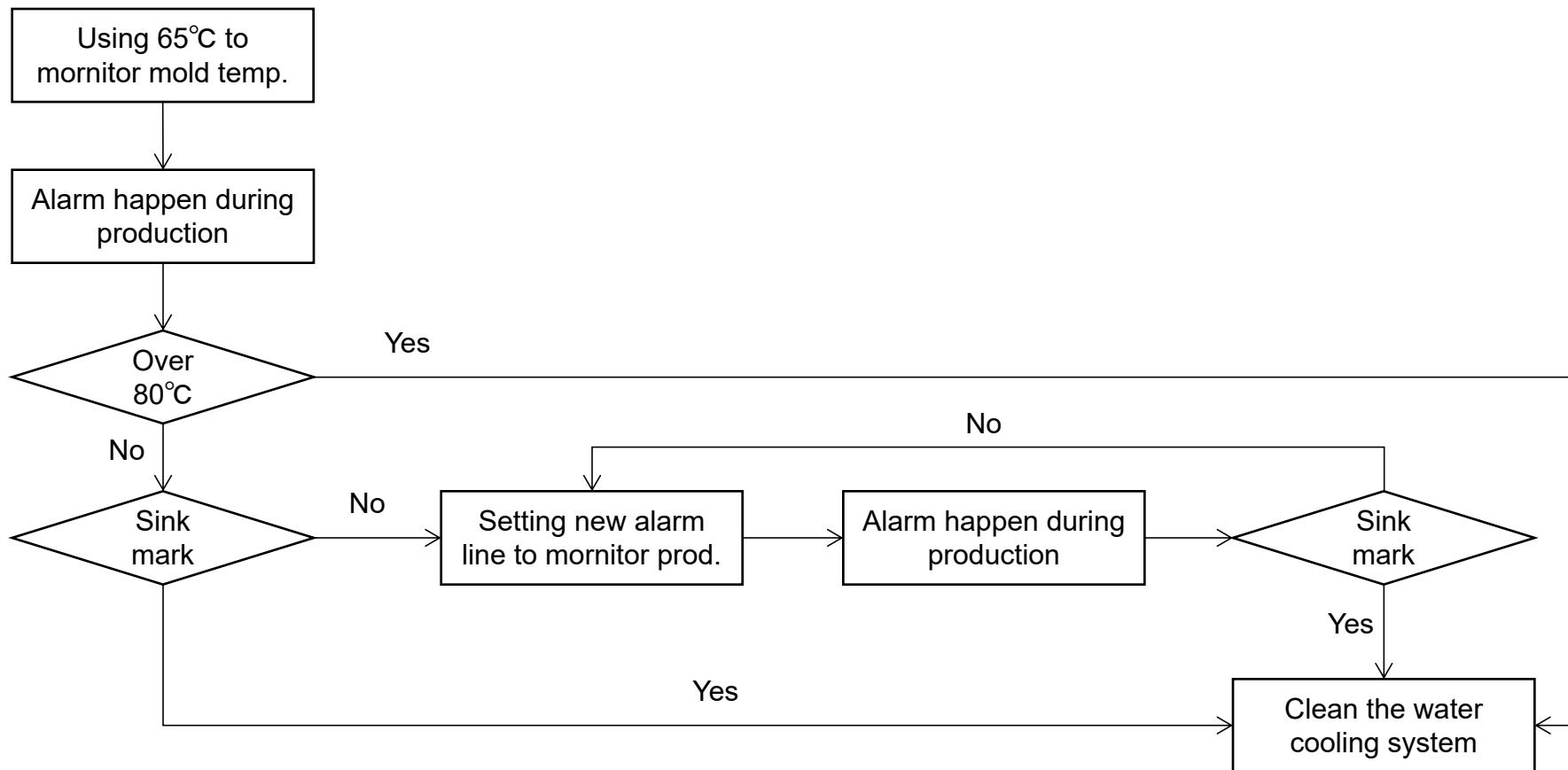
It seems no significant impact to PM27 (J-K profile) when mold temp. changing from this IR study.

Max. mold temperature alarm line setting for IR system



- Maybe BMS can use the 65°C to monitor the mold temperature for PQ run as trial run and decide to what a higher alarm line to monitor in future.
- To check the j-k surface for sink mark if IR system alarm (means some cavity temperature over alarm line) ,the abnormal cavity can be found on the screen easily,if j-k surface no sink mark go on production otherwise clean the water cooling system.

How to make an available alarm line for monitoring mold temperature



At PQ stage BMS will use this method to find & evaluate an available alarm setting for mass production.

Thank you!