

Order of experiment

		level		
control factors		1	2	3
A	Cylinder temperature (°C)	175	200	
B	Injection speed(sec)	15	20	25
C	VP change position (mm)	6	9	12
D	Holding pressure(kgf)	5	10	15
E	Holding time (sec)	1.5	2	2.5
F	Cooling time(sec)	20	25	30
G	Back pressure (kgf)	5	10	15
H	Screw rotation speed(%)	20	25	30

		level		
control factors		1	2	3
A	VP change position (mm)	6	12	
B	Injection speed(sec)	15	20	25
C	Cylinder temperature (°C)	175	190	200
D	Holding pressure(kgf)	5	10	15
E	Holding time (sec)	1.5	2	2.5
F	Cooling time(sec)	20	25	30
G	Back pressure (kgf)	5	10	15
H	Screw rotation speed(%)	20	25	30

1min/1°C up
5min/1°C down

Waiting time
175→200°C
25°C × 1min/1°C up
= 25min

L18	A	B	C	D	E	F	G	H
expt.1	1	1	1	1	1	1	1	1
expt.2	1	1	2	2	2	2	2	2
expt.3	1	1	3	3	3	3	3	3
expt.4	1	2	1	1	2	2	3	3
expt.5	1	2	2	2	3	3	1	1
expt.6	1	2	3	3	1	1	2	2
expt.7	1	3	1	2	1	3	2	3
expt.8	1	3	2	3	2	1	3	1
expt.9	1	3	3	1	3	2	1	2
expt.10	2	1	1	3	3	2	2	1
expt.11	2	1	2	1	1	3	3	2
expt.12	2	1	3	2	2	1	1	3
expt.13	2	2	1	2	3	1	3	2
expt.14	2	2	2	3	1	2	1	3
expt.15	2	2	3	1	2	3	2	1
expt.16	2	3	1	3	2	3	1	2
expt.17	2	3	2	1	3	1	2	3
expt.18	2	3	3	2	1	2	3	1

Waiting time

175→190°C 6times
15°C × 1min/1°C up × 6
= 90min

190→200°C 6times
10°C × 1min/1°C up × 6
= 60min

200→175°C 5times
25°C × 5min/1°C down
× 5 = 625min

sum of time 775min

Comparison of waiting time

in order

L18	C
expt.1	1
expt.2	2
expt.3	3
expt.4	1
expt.5	2
expt.6	3
expt.7	1
expt.8	2
expt.9	3
expt.10	1
expt.11	2
expt.12	3
expt.13	1
expt.14	2
expt.15	3
expt.16	1
expt.17	2
expt.18	3

Waiting time
 $175 \rightarrow 190^{\circ}\text{C}$ 6times
 $15^{\circ}\text{C} \times 1\text{min} / 1^{\circ}\text{C up}$
 $\times 6 = 90\text{min}$

$190 \rightarrow 200^{\circ}\text{C}$ 6times
 $10^{\circ}\text{C} \times 1\text{min} / 1^{\circ}\text{C up}$
 $\times 6 = 60\text{min}$

$200 \rightarrow 175^{\circ}\text{C}$ 5times
 $25^{\circ}\text{C} \times 5\text{min} / 1^{\circ}\text{C down}$
 $\times 5 = 625\text{min}$

sum of time 775min

order alignment

L18	C
expt.1	1
expt.4	1
expt.7	1
expt.10	1
expt.13	1
expt.16	1
expt.2	2
expt.5	2
expt.8	2
expt.11	2
expt.14	2
expt.17	2
expt.3	3
expt.6	3
expt.9	3
expt.12	3
expt.15	3
expt.18	3

Waiting time
 $175 \rightarrow 190^{\circ}\text{C}$ 1time
 $15^{\circ}\text{C} \times 1\text{min} / 1^{\circ}\text{C up} \times 1$
 $= 15\text{min}$

$190 \rightarrow 200^{\circ}\text{C}$ 1time
 $10^{\circ}\text{C} \times 1\text{min} / 1^{\circ}\text{C up} \times 1$
 $= 10\text{min}$

sum of time 25min