

# [The case of the variable laminates](https://assignbuster.com/the-case-of-the-variable-laminates/)

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The Case of Variable Laminates In the current scenario, there are three major experimental variables that need to be investigated simultaneously for their effect on process outcome. These variables are soak time, soak temperature and knife pressure. Knife setting is being left out since it has no discernible impact on process output. The typical operating ranges for these parameters are outlined in the table shown below.
Soak Time (minutes)
Soak Temperature (oC)
Knife Pressure (psi)
30
150
250
60
200
300
Operating Range
30
50
50
A rational approach for enhanced process control would be to investigate these parameters such that for each experiment each variable’s operating range is divided by 5 to reveal a sizable increment. This would indicate that soaking time is incremented by 6 minutes, soaking temperature by 10oC and knife pressure by 10 psi. The resulting Taguchi experimental design orthogonal array would assume the form shown in the Appendix. The total number of experiments required would be 36.
The thickness measurements are previously being made at every 15 minutes but a greater frequency for soaking time has been defined in order to ensure that process control experimentation resolution is enhanced. The contention in running these experimental runs is to measure the resulting laminate thickness. Once laminate thickness has been tabulated against each experimental run, statistical methods can be used to determine the optimal running conditions. Multiple combinations of operating parameters may produce the desired thickness so other factors such as power consumption may be used to decipher the final operating conditions.
Appendix
Experiment Number
Soak Time (minutes)
Soak Temperature (oC)
Knife Pressure (psi)
1
30
150
250
2
30
160
260
3
30
170
270
4
30
180
280
5
30
190
290
6
30
200
300
7
36
150
250
8
36
160
260
9
36
170
270
10
36
180
280
11
36
190
290
12
36
200
300
13
42
150
250
14
42
160
260
15
42
170
270
16
42
180
280
17
42
190
290
18
42
200
300
19
48
150
250
20
48
160
260
21
48
170
270
22
48
180
280
23
48
190
290
24
48
200
300
25
54
150
250
26
54
160
260
27
54
170
270
28
54
180
280
29
54
190
290
30
54
200
300
31
60
150
250
32
60
160
260
33
60
170
270
34
60
180
280
35
60
190
290
36
60
200
300