

Design of Experiments

Description

This template illustrates DOE or Design of Experiments sometimes called a Statistically Designed Experiment. A detailed discussion of DOE can be found at www.ASQ.org

[Learn About Design of Experiments](#)

Instructions

- Enter the High and Low levels for factor A, B and C. Names and Levels are recommended but not required.

Factor Name	Factor Letter	Low Setting	High Setting
Boost	A	45	90
Moist	B	6	10
Cycle	C	11	16

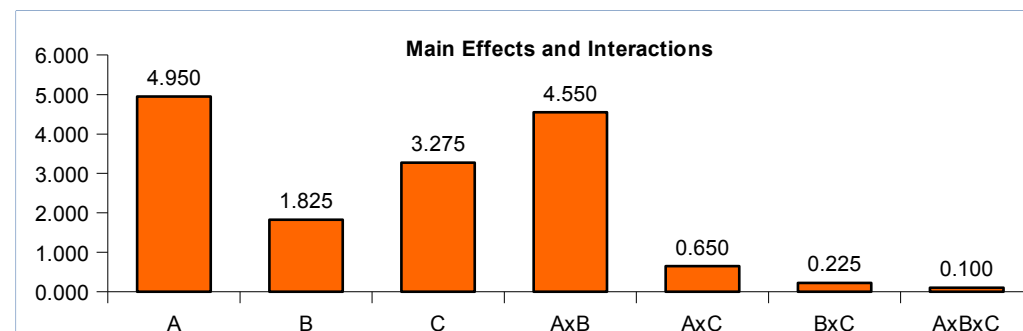
- Run each of the eight combinations in random order using the Run Order Column.
- Collect at least one output measurement for each of the eight runs. Five are recommended.
- Review the bar graph to identify the factors or interactions having the greatest effect.
- If the effect of an interaction is shown to be large, use the interaction plots to determine the best settings that will optimize the output.
- Detailed calculations can be displayed by clicking on the radio button for any factor or interaction.

Learn More

To learn more about other quality tools, visit the ASQ Learn About Quality web site.

[Learn About Quality](#)

Run Order	Boost	Moist	Cycle	AxB	AxC	BxC	AxBxC	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Avg
1	6	45	6	11	1	1	-1	17.9	17.6				17.75
2	8	45	6	16	1	-1	1	20.3	20.2				20.25
3	1	45	10	11	-1	1	1	15	14.8				14.9
4	4	45	10	16	-1	-1	1	18	17.3				17.65
5	2	90	6	11	-1	1	1	17.5	17.7				17.6
6	5	90	6	16	-1	1	-1	21.5	20.9				21.2
7	3	90	10	11	1	-1	-1	24.2	23.1				23.65
8	7	90	10	16	1	1	1	27.6	28.2				27.9



Select Factor or Interaction for Calculation Details:

☐ A

High (+1) settings:

Effect:

☐ B

average (17.75 20.25 23.65 27.9) = 22.3875

22.3875
- 17.8375

4.55

☐ C

Low (-1) settings:

☐ A x B

average (14.9 17.65 17.6 21.2) = 17.8375

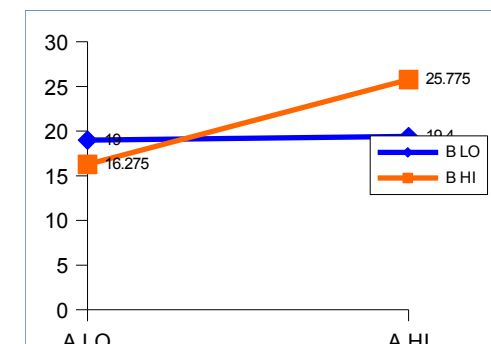
☐ A x C

☐ B x C

☐ A x B x C

A x B Interaction

	B LO	B HI
A LO	17.75	14.9
2	20.25	17.65
Avg	19	16.275
A HI	17.6	23.65
2	21.2	27.9
Avg	19.4	25.775



	Run Order	Boost	Moist	Cycle	AxB	AxC	BxC	AxBxC	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Avg
1	# 6	45	6	11	1	1	1	-1	17.9	17.6				17.75
2	# 8	45	6	16	1	-1	-1	1	20.3	20.2				20.25
3	# 1	45	10	11	-1	1	-1	1	15	14.8				14.9
4	# 4	45	10	16	-1	-1	1	-1	18	17.3				17.65
5	# 2	90	6	11	-1	-1	1	1	17.5	17.7				17.6
6	# 5	90	6	16	-1	1	-1	-1	21.5	20.9				21.2
7	# 3	90	10	11	1	-1	-1	-1	24.2	23.1				23.65
8	# 7	90	10	16	1	1	1	1	27.6	28.2				27.9

	B LO	B HI
A LO	19	16.275
A HI	19.4	25.775

Factor Name	Factor Letter	Lo Setting	Hi Setting
Boost	A	45	90
Moist	B	6	10
Cycle	C	11	16

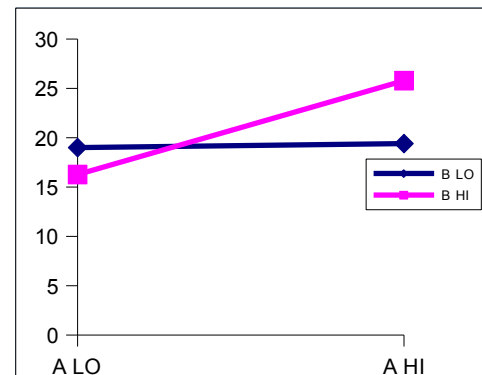
	C LO	C HI
B LO	17.675	20.725
B HI	19.275	22.775

	B LO	B HI
A LO	19	16.275
A HI	19.4	25.775

	C LO	C HI
A LO	16.325	18.95
A HI	20.625	24.55

Effect of	A	4.950
Effect of	B	1.825
Effect of	C	3.275
Effect of	AxB	4.550
Effect of	AxC	0.650
Effect of	BxC	0.225
Effect of	AxBxC	0.100

Radio Button
4



A x B Interaction

		B LO	B HI
A LO	1	17.75	14.9
	2	20.25	17.65
	Avg	19	16.275
A HI	1	17.6	23.65
	2	21.2	27.9
	Avg	19.4	25.775

30 **A X B Interaction**

30 **A X C Interaction**

25 **B X C Interaction**

This template was written for the American Society for Quality by

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Your feedback is welcome and encouraged. Please e-mail to:

Stat_Aids@yahoo.com