

In an investigation of the can-making properties of tin plate, two methods of annealing were studied. Three coils were selected at random out of a large population of coils made by each of these two methods. Samples were taken from 2 of many locations - in this case the head and tail of each coil. A measurement of the can life was obtained.

```
options nodate nonumber ls=80 nocenter;
data can;
  input method coil location life @@;
  datalines;
1 1 1 288 1 2 1 355 1 3 1 329 1 1 2 278 1 2 2 336 1 3 2 320
2 1 1 310 2 2 1 303 2 3 1 299 2 1 2 288 2 2 2 302 2 3 2 289
;

proc glm;
class method coil location;
model life = method coil(method) location method*location;
random coil(method) location method*location / test;
run;
```

Source	Type III Expected Mean Square
method	Var(Error) + 3 Var(method*location) + 2 Var(coil(method)) + Q(method)
coil(method)	Var(Error) + 2 Var(coil(method))
location	Var(Error) + 3 Var(method*location) + 6 Var(location)
method*location	Var(Error) + 3 Var(method*location)

Tests of Hypotheses for Mixed Model Analysis of Variance

Dependent Variable: life

Source	DF	Type III SS	Mean Square	F Value	Pr > F
method	1	1102.083333	1102.083333	1.11	0.3561
Error	3.7414	3728.626888	996.583333		
Error: MS(coil(method)) + MS(method*location) - MS(Error)					

Source	DF	Type III SS	Mean Square	F Value	Pr > F
coil(method)	4	4119.333333	1029.833333	29.15	0.0032
method*location	1	2.083333	2.083333	0.06	0.8201
Error: MS(Error)	4	141.333333	35.333333		

Source	DF	Type III SS	Mean Square	F Value	Pr > F
location	1	420.083333	420.083333	201.64	0.0448
Error	1	2.083333	2.083333		
Error: MS(method*location)					

```
proc glm;
class method coil location;
model life = method coil(method) location;
random coil(method) location / test;
run;
```

Source	Type III Expected Mean Square
method	Var(Error) + 2 Var(coil(method)) + Q(method)
coil(method)	Var(Error) + 2 Var(coil(method))
location	Var(Error) + 6 Var(location)

Tests of Hypotheses for Mixed Model Analysis of Variance

Dependent Variable: life

Source	DF	Type III SS	Mean Square	F Value	Pr > F
method	1	1102.083333	1102.083333	1.07	0.3594
Error	4	4119.333333	1029.833333		
Error: MS(coil(method))					

Source	DF	Type III SS	Mean Square	F Value	Pr > F
coil(method)	4	4119.333333	1029.833333	35.90	0.0007
location	1	420.083333	420.083333	14.65	0.0123
Error: MS(Error)	5	143.416667	28.683333		