

APPENDIX – I. ANOVA for reduced backward quadratic model

(a) $W_{a_molding}$, (b) $W_{a_plating}$, (c) Cr_{Thick} , (d) Ni_{Thick} , (e) Cu_{Thick} , (f) $L_{b_plating}$, (g) $W_{b_plating}$,
(h) $W_{a_plating}$, and (i) Step

Source	Sum of square	dof	Mean square	F value	P value	Fit Statistics
(a) $W_{a_molding}$						
Model	0.1194	10	0.0119	3.43	0.0022*	Std. Dev.: 0.0590
MT	0.0020	1	0.0020	0.5807	0.4501	Mean: 0.8827
IP	0.0021	1	0.0021	0.6147	0.4372	C.V. %: 6.68
RT	0.0020	1	0.0020	0.5841	0.4488	R²: 0.4387
GS	0.0012	1	0.0012	0.3565	0.5535	R²_{Adj}: 0.3105
RC	0.0077	1	0.0077	2.21	0.1446	R²_{Pred}: 0.1154
EC	0.0024	1	0.0024	0.6962	0.4086	Adeq. Precision: 6.5324
MT*RT	0.0383	1	0.0383	11.00	0.0018*	
MT*EC	0.0191	1	0.0191	5.50	0.0236*	
RC*EC	0.0248	1	0.0248	7.14	0.0105*	
GS ²	0.0232	1	0.0232	6.66	0.0133*	
Residual	0.1530	44	0.0035			
Lack of Fit	0.1278	39	0.0033	0.6482	0.8008	
Pure Error	0.0253	5	0.0051			
Total	0.2724	54				

Regression Equation (coded):

$$W_{a_molding} = 0.8235 + 0.00655MT + 0.0068IP + 0.00695RT - 0.0053GS - 0.01281RC + 0.0072EC - 0.0311MT \cdot RT + 0.02176MT \cdot EC - 0.0260RC \cdot EC + 0.0660GS^2$$

(b) $W_{a_plating}$						
Model	0.1667	7	0.0238	4.93	0.0003*	Std. Dev.: 0.0695
DT	0.0003	1	0.0003	0.0719	0.7898	Mean: 1.09
ET	0.0037	1	0.0037	0.7598	0.3878	C.V. %: 6.40
RC	0.0099	1	0.0099	2.05	0.1587	R²: 0.4235
EC	0.0070	1	0.0070	1.45	0.2340	R²_{Adj}: 0.3376
ET*EC	0.0386	1	0.0386	8.00	0.0069*	R²_{Pred}: 0.2053
RC*EC	0.0444	1	0.0444	9.20	0.0039*	Adeq. Precision: 8.4484
DT ²	0.0684	1	0.0684	14.16	0.0005*	
Residual	0.2269	47	0.0048			

Lack of Fit	0.2167	42	0.0052	2.51	0.1529
Pure Error	0.0103	5	0.0021		
Cor Total	0.3937	54			

Regression Equation (coded):

$$Wl_{wa_plating} = 0.9794 - 0.0027DT + 0.0088ET - 0.0145RC - 0.0126EC + 0.0311ET \cdot EC - 0.0333RC \cdot EC + 0.1176 DT^2$$

(c) Cr_{Thick}

Model	5.359E-08	5	1.072E-08	4.46	0.0020*	Std. Dev.: 0.0000
MT	4.326E-09	1	4.326E-09	1.80	0.1858	Mean: 0.0002
DT	6.425E-12	1	6.425E-12	0.0027	0.9590	C.V. %: 20.59
RC	1.582E-08	1	1.582E-08	6.59	0.0134*	R²: 0.3129
MT*DT	1.457E-08	1	1.457E-08	6.07	0.0173*	R²_{Adj}: 0.2428
MT ²	2.285E-08	1	2.285E-08	9.51	0.0033*	R²_{Pred}: 0.1371
Residual	1.177E-07	49	2.402E-09			Adeq. Precision: 8.3874
Lack of Fit	7.459E-08	44	1.695E-09	0.1967	0.9991	
Pure Error	4.310E-08	5	8.620E-09			
Cor Total	1.713E-07	54				

Regression Equation (coded):

$$Cr_{Thick} = 0.0003 - 9.441E-06MT - 3.698E-07DT + 0.0000RC + 0.0000MT \cdot DT - 0.0001MT^2$$

(d) Ni_{Thick}

Model	0.0001	6	0.0000	3.31	0.0083*	Std. Dev.: 0.0021
ET	3.686E-06	1	3.686E-06	0.8524	0.3605	Mean: 0.0156
GS	2.706E-06	1	2.706E-06	0.6258	0.4328	C.V. %: 13.34
RC	0.0000	1	0.0000	2.62	0.1121	R²: 0.2926
EC	5.202E-06	1	5.202E-06	1.20	0.2782	R²_{Adj}: 0.2042
ET*EC	0.0000	1	0.0000	6.44	0.0144*	R²_{Pred}: 0.0664
GS*RC	0.0000	1	0.0000	9.13	0.0040*	Adeq. Precision: 7.2352
Residual	0.0002	48	4.324E-06			
Lack of Fit	0.0002	43	4.071E-06	0.6263	0.8185	
Pure Error	0.0000	5	6.500E-06			
Cor Total	0.0003	54				

Regression Equation (coded):

$$Ni_{Thick} = 0.0156 - 0.0003ET - 0.0002GS + 0.0005RC + 0.0003EC + 0.0009ET \cdot EC + 0.0010GS \cdot RC$$

(e) Cu_{Thick}

Model	0.0002	9	0.0000	5.72	< 0.0001*	Std. Dev.: 0.0017
MT	2.044E-06	1	2.044E-06	0.6910	0.4102	Mean: 0.0153
RT	0.0000	1	0.0000	7.06	0.0109*	C.V. %: 11.25
GS	2.996E-06	1	2.996E-06	1.01	0.3196	R²: 0.5335
RC	0.0000	1	0.0000	7.96	0.0071*	R²_{Adj}: 0.4401
EC	0.0000	1	0.0000	7.09	0.0107*	R²_{Pred}: 0.3372
GS*RC	0.0000	1	0.0000	13.63	0.0006*	Adeq. Precision: 10.1205
MT ²	0.0000	1	0.0000	7.89	0.0073*	
GS ²	0.0000	1	0.0000	15.17	0.0003*	
RC ²	0.0000	1	0.0000	4.51	0.0391*	
Residual	0.0001	45	2.958E-06			
Lack of Fit	0.0001	40	3.016E-06	1.21	0.4633	
Pure Error	0.0000	5	2.500E-06			
Cor Total	0.0003	54				

Regression Equation (coded):

$$\text{Cu}_{\text{Thick}} = +0.0135 + 0.0002\text{MT} - 0.0007\text{RT} - 0.0003\text{GS} + 0.0007\text{RC} + 0.0007\text{EC} + 0.0010\text{GS} \cdot \text{RC} - 0.0025\text{MT}^2 + 0.0030\text{GS}^2 + 0.0016\text{RC}^2$$

(f) L_{b_plating}

Model	18.08	12	1.51	4.96	< 0.0001*	Std. Dev.: 0.5514
MT	0.0379	1	0.0379	0.1248	0.7256	Mean: 1700.85
IP	0.0623	1	0.0623	0.2050	0.6530	C.V. %: 0.0324
DT	0.0818	1	0.0818	0.2691	0.6067	R²: 0.5861
ET	0.0019	1	0.0019	0.0061	0.9382	R²_{Adj}: 0.4679
RT	1.50	1	1.50	4.93	0.0318*	R²_{Pred}: 0.2554
GS	3.41	1	3.41	11.21	0.0017*	Adeq. Precision: 11.5374
RC	0.0175	1	0.0175	0.0576	0.8115	
MT*ET	2.33	1	2.33	7.65	0.0084*	
MT*RT	2.87	1	2.87	9.44	0.0037*	
DT*ET	1.37	1	1.37	4.51	0.0396*	
IP ²	2.40	1	2.40	7.90	0.0075*	
RC ²	1.85	1	1.85	6.08	0.0179*	
Residual	12.77	42	0.3040			

Lack of Fit	12.10	37	0.3271	2.46	0.1583
Pure Error	0.6637	5	0.1327		
Cor Total	30.85	54			

Regression Equation (coded):

$$L_{b_plating} = +1701 - 0.0286MT + 0.0377IP - 0.0422DT + 0.0064ET + 0.1842RT + 0.2963GS - 0.0197RC + 0.2346MT \cdot ET + 0.2667MT \cdot RT + 0.1842DT \cdot ET - 0.7254IP^2 + 0.6068RC^2$$

(g) $W_{b_plating}$

Model	1.10	3	0.3669	57.19	< 0.0001*	Std. Dev.: 0.0801
IP	0.0005	1	0.0005	0.0840	0.7731	Mean: 0.3498
GS	0.8407	1	0.8407	131.03	< 0.0001*	C.V. %: 22.90
IP ²	0.0350	1	0.0350	5.46	0.0235*	R²: 0.7709
Residual	0.3272	51	0.0064			R²_{Adj}: 0.7574
Lack of Fit	0.3082	46	0.0067	1.76	0.2771	R²_{Pred}: 0.7331
Pure Error	0.0191	5	0.0038			Adeq. Precision: 16.8447
Cor Total	1.43	54				

Regression Equation (coded):

$$W_{b_plating} = 0.2700 - 0.0034IP - 0.1403GS + 0.0800IP^2$$

(h) $W_{a_plating}$

Model	1.45	8	0.1812	24.26	< 0.0001*	Std. Dev.: 0.0864
IP	0.0064	1	0.0064	0.8550	0.3600	Mean: 0.3455
ET	8.982E-06	1	8.982E-06	0.0012	0.9725	C.V. %: 25.01
RT	0.0379	1	0.0379	5.08	0.0290*	R²: 0.8084
GS	0.8513	1	0.8513	113.99	< 0.0001*	R²_{Adj}: 0.7751
RC	0.0393	1	0.0393	5.27	0.0263*	R²_{Pred}: 0.7251
EC	0.0360	1	0.0360	4.82	0.0333*	Adeq. Precision: 16.8372
ET*GS	0.0528	1	0.0528	7.07	0.0108*	
IP ²	0.0729	1	0.0729	9.76	0.0031*	
Residual	0.3435	46	0.0075			
Lack of Fit	0.3267	41	0.0080	2.36	0.1708	
Pure Error	0.0169	5	0.0034			
Cor Total	1.79	54				

Regression Equation (coded):

$$W_{a_plating} = 0.2231 - 0.0117IP + 0.0004ET - 0.0288RT - 0.1453GS - 0.0292RC - 0.0294EC - 0.0366ET \cdot GS + 0.1201IP^2$$

(i) Step

Model	1901.39	8	237.67	35.64	< 0.0001*	Std. Dev.: 2.58
IP	0.5145	1	0.5145	0.0772	0.7824	Mean: 116.82
ET	0.3844	1	0.3844	0.0576	0.8113	C.V. %: 2.21
RT	28.23	1	28.23	4.23	0.0453*	R²: 0.8611
GS	1590.37	1	1590.37	238.46	< 0.0001*	R²_{Adj}: 0.8369
RC	31.24	1	31.24	4.68	0.0357*	R²_{Pred}: 0.7972
IP*ET	45.46	1	45.46	6.82	0.0122*	Adeq. Precision: 17.1727
RT*RC	41.28	1	41.28	6.19	0.0165*	
ET ²	28.46	1	28.46	4.27	0.0445*	
Residual	306.79	46	6.67			
Lack of Fit	269.29	41	6.57	0.8757	0.6460	
Pure Error	37.50	5	7.50			
Cor Total	2208.18	54				

Regression Equation (coded):

$$W_{a_plating} = 119.42 + 0.1057IP - 0.0906ET + 0.8233RT + 5.97GS + 0.8169RC - 1.04IP \cdot ET + 1.03RT \cdot RC - 2.31ET^2$$

APPENDIX – II. Coefficients Table (Significant values are shown in bold letters)

	Intercept	MT	IP	DT	ET	RT	GS	RC	EC	MT·DT	MT·ET	MT·RT	IP·ET	IP·EC	DT·ET	ET·GS	ET·EC	RC·GS	RC·EC	MT ²	IP ²	DT ²	ET ²	GS ²	RC ²
W_{w_molding}	0.8235	0.0066	0.0069			0.0070	-0.0053	-0.0128	0.0073				-0.0311	0.0218					-0.0260					0.0661	
p-values		0.4501	0.4372			0.4488	0.5535	0.1446	0.4086				0.0018	0.0236					0.0105					0.0133	
W_{w_plating}	0.9794			-0.0027	0.0088			-0.0145	-0.0126								0.0311		-0.0333			0.1176			
p-values				0.7898	0.3878			0.1587	0.2340								0.0069		0.0039			0.0005			
C_{r_Thick}	0.0003	0.0000		0.0000				0.0000	0.0000											-0.0001					
p-values		0.1858		0.9590				0.0134	0.0173											0.0033					
N_{i_Thick}	0.0156				-0.0003		-0.0002	0.0005	0.0003								0.0009	0.0010							
p-values					0.3605		0.4328	0.1121	0.2782								0.0144	0.0040							
C_{u_Thick}	0.0135	0.0002				-0.0007	-0.0003	0.0007	0.0007										0.0010	-0.0025			0.0030	0.0016	
p-values		0.4102				0.0109	0.3196	0.0071	0.0107										0.0006	0.0073			0.0003	0.0391	
L_{b_plating}	1701.0000	-0.0286	0.0377	-0.0422	0.0064	0.1842	0.2963	-0.0197			0.2346	0.2667			0.1842						-0.7254			0.6068	
p-values		0.7256	0.6530	0.6067	0.9382	0.0318	0.0017	0.8115			0.0084	0.0037			0.0396						0.0075			0.0179	
W_{b_plating}	0.2700		-0.0034				-0.1403														0.0800				
p-values			0.7731				< 0.0001														0.0235				
W_{a_plating}	0.2231		-0.0117		0.0004	-0.0288	-0.1453	-0.0292	-0.0294							-0.0366					0.1201				
p-values			0.3600		0.9725	0.0290	< 0.0001	0.0263	0.0333							0.0108					0.0031				
Step	119.4190		0.1057		-0.0906	0.8233	5.9714	0.8169					-1.0417				1.0343						-2.3063		
p-values			0.7824		0.8113	0.0453	< 0.0001	0.0357					0.0122				0.0165						0.0445		