

Supplementary material for

Constitutive behavior of an AA4032 piston alloy with Cu and Er additions upon high temperature compressive deformation

Suwaree Chankitmunkong^{1, 2, a*}, Dmitry G. Eskin^{2, 3, b}, and Chaowalit Limmaneevichitr^{1, c}

¹Department of Production Engineering, Faculty of Engineering, King Mongkut's University of Technology Thonburi, 126 Pracha-Uttd Rd., Bangmod, Tungkhru, Bangkok, 10140 Thailand

²Brunel University London, BCAST, Uxbridge, Middlesex UB8 3PH, United Kingdom

³Tomsk State University, Tomsk 634050, Russian Federation

^{a*} Corresponding author: suwaree.03@mail.kmutt.ac.th, dmitry.eskin@brunel.ac.uk,

^cchaowalit.lim@mail.kmutt.ac.th

Polynomial regression coefficients of three experimental alloys in Eqs. (13)-(16);

$$n' = a_0 + a_1\varepsilon + a_2\varepsilon^2 + a_3\varepsilon^3 + a_4\varepsilon^4 + a_5\varepsilon^5 + a_6\varepsilon^6 \quad (13)$$

$$\alpha = b_0 + b_1\varepsilon + b_2\varepsilon^2 + b_3\varepsilon^3 + b_4\varepsilon^4 + b_5\varepsilon^5 + b_6\varepsilon^6 \quad (14)$$

$$\beta = c_0 + c_1\varepsilon + c_2\varepsilon^2 + c_3\varepsilon^3 + c_4\varepsilon^4 + c_5\varepsilon^5 + c_6\varepsilon^6 \quad (15)$$

$$Q = d_0 + d_1\varepsilon + d_2\varepsilon^2 + d_3\varepsilon^3 + d_4\varepsilon^4 + d_5\varepsilon^5 + d_6\varepsilon^6 \quad (16)$$

Table S1 Polynomial regression coefficient results of n' , α , β , Q

Coefficient n'	Values			Coefficient α	Values		
	1Cu	3.5Cu	3.5Cu+0.4Er		1Cu	3.5Cu	3.5Cu+0.4Er
a_0	10.36	15.15	11.04	b_0	0.02	0.02	0.02
a_1	-78.33	-170.07	-95.17	b_1	-0.25	-0.17	-0.24
a_2	614.27	1413.15	745.81	b_2	2.28	1.62	2.24
a_3	-2469.20	-5971.75	-2979.65	b_3	-9.92	-7.15	-9.79
a_4	5381.76	13529.68	6435.10	b_4	22.76	16.48	22.44
a_5	-6044.82	-15625.16	-7151.64	b_5	-26.38	-19.10	-25.93
a_6	2742.16	7219.06	3207.56	b_6	12.17	8.80	11.90

coefficient β	Values			Coefficient Q	Values		
	1Cu	3.5Cu	3.5Cu+0.4Er		1Cu	3.5Cu	3.5Cu+0.4Er
c_0	0.21	0.23	0.20	d_0	0.21	0.23	0.20
c_1	-2.92	-3.48	-2.95	d_1	-2.92	-3.48	-2.95
c_2	25.13	30.64	25.51	d_2	25.13	30.64	25.51
c_3	-106.97	-132.40	-108.34	d_3	-106.97	-132.40	-108.34
c_4	242.33	303.24	244.20	d_4	242.33	303.24	244.20
c_5	-278.94	-351.89	-279.37	d_5	-278.94	-351.89	-279.37
c_6	128.29	162.81	127.63	d_6	128.29	162.81	127.63