



**Cobalt Brands Analysis**

	VALE	TCC998	SMM998	SC9995	KLK9995	CASH	CASH (revised spec)	CMBA	CMBA (revised spec)	CMA	CMF	FC COARSE COBALT POWDER	MORNICKEL	HUAYOU	HUAYOU (revised spec)	AMBATOYVY COBALT BRIQUETTES	MINARA COBALT BRIQUETTES	UMICORE COBALT POWDER S1	TENGYUAN																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Date Listed	18/04/2014	17/11/2009	23/11/2009	30/11/2009	29/01/2010	04/05/2010	04/05/2010	26/04/2011	22/05/2010	20/08/2013	20/06/2013	22/12/2015	22/10/2020	16/07/2019	05/03/2020	12/11/2019	17/03/2020	13/10/2021	20/06/2023																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Notice	12/1/05	09/4/18	09/4/27	09/4/34	10/3/31	10/1/16	17/2/41	11/1/03	18/2/17	13/2/3	13/2/4	16/3/98	20/2/27	19/2/25	20/5/58	19/2/55	20/6/53	21/1/53	22/1/08																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Elements																					Al	0.0002	0.0010		0.002	0.003	0.001	0.002			0.0010	0.0010				0.002			0.005		0.002	As	0.0002			0.005	0.005	0.005	0.005	0.0007							0.0007					0.0007	Ba				0.0003	0.0005	0.0003	0.0003	0.0003	0.0003						0.0003					0.0003	C	0.0050	0.0050	0.01	0.005	0.007	0.005	0.005	0.0075	0.010	0.0200	0.0100	0.1	0.01	0.0047	0.005	0.02	0.015	0.1	0.003	Ca		0.0010		0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005									0.005	Cd	0.0001	0.0025	0.0005	0.0003	0.0005	0.0003	0.005	0.0010	0.0010	0.0050	0.0015	0.001	0.0003	0.0005	0.0005	0.0005	0.0005	0.001	0.0005	Co	99.8	99.8	99.8	99.95	99.95	99.95	99.95	99.95	99.95	99.80	99.90	99.80	99.90	99.95	99.95	99.80	99.8	99.8	99.95	Cr		0.0010						0.0020	0.0020											0.005	Cu	0.0002	0.0030	0.01	0.003	0.006	0.004	0.005	0.0050	0.0050	0.0050	0.0040	0.0015	0.005	0.0007	0.005	0.01	0.008	0.0015	0.003	Fe	0.0001	0.0100	0.01	0.006	0.006	0.005	0.006	0.010	0.010	0.0100	0.0050	0.001	0.005	0.0017	0.006	0.02	0.025	0.01	0.001	Mg		0.0010		0.002	0.002	0.001	0.002	0.002	0.0020	0.0030	0.0010				0.002					0.002	Mn	0.0001	0.0030	0.001	0.005	0.005	0.001	0.005	0.0050	0.0050	0.0100	0.0020	0.005	0.0001	0.0002	0.005	0.005	0.005	0.005	0.005	Ni	0.1	0.0005	0.10	0.005	0.008	0.005	0.01	0.005	0.005	0.0050	0.0040	0.005	0.05	0.0003	0.01	0.05	0.1	0.005	0.005	P	0.0003			0.001	0.002	0.001	0.001								0.001					0.001	Pb	0.0001	0.0020	0.001	0.0004	0.0005	0.001	0.0005	0.0050	0.0100	0.0060	0.0040	0.001	0.0003	0.0002	0.0005	0.0005	0.005	0.005	0.001	0.0001	S	0.0010	0.0050	0.001	0.001	0.002	0.001	0.001	0.007	0.010	0.0050	0.0050	0.04	0.001	0.0002	0.001	0.0005	0.010	0.04	0.00	Sb	0.0004			0.0003	0.0005	0.0003	0.0006								0.0006					0.0006	Se	0.0001																				Si		0.0010	0.001	0.003	0.003	0.001	0.003			0.0010	0.0010				0.003					0.003	Sn				0.0003	0.0005	0.0003	0.0003								0.0005					0.0001	Zn	0.0010	0.0025	0.002	0.002	0.003	0.001	0.002	0.0050	0.0050	0.0070	0.0050	0.001	0.0004	0.0002	0.002	0.0005	0.005	0.005	0.001	0.002	Tons **	1500	1800	2000	4500	1200	1000	1000	2000	2000	8500	6500	5200	2000	2000	2000	5400	3000	15,000	2000	Shape*	R	BC	CC	CC	CC	CC	CC	BC	BC	BC	BC	CGP	CC	CC	CC	BR	BR	CGP	CC
Al	0.0002	0.0010		0.002	0.003	0.001	0.002			0.0010	0.0010				0.002			0.005		0.002																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
As	0.0002			0.005	0.005	0.005	0.005	0.0007							0.0007					0.0007																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Ba				0.0003	0.0005	0.0003	0.0003	0.0003	0.0003						0.0003					0.0003																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
C	0.0050	0.0050	0.01	0.005	0.007	0.005	0.005	0.0075	0.010	0.0200	0.0100	0.1	0.01	0.0047	0.005	0.02	0.015	0.1	0.003																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Ca		0.0010		0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005									0.005																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Cd	0.0001	0.0025	0.0005	0.0003	0.0005	0.0003	0.005	0.0010	0.0010	0.0050	0.0015	0.001	0.0003	0.0005	0.0005	0.0005	0.0005	0.001	0.0005																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Co	99.8	99.8	99.8	99.95	99.95	99.95	99.95	99.95	99.95	99.80	99.90	99.80	99.90	99.95	99.95	99.80	99.8	99.8	99.95																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Cr		0.0010						0.0020	0.0020											0.005																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Cu	0.0002	0.0030	0.01	0.003	0.006	0.004	0.005	0.0050	0.0050	0.0050	0.0040	0.0015	0.005	0.0007	0.005	0.01	0.008	0.0015	0.003																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Fe	0.0001	0.0100	0.01	0.006	0.006	0.005	0.006	0.010	0.010	0.0100	0.0050	0.001	0.005	0.0017	0.006	0.02	0.025	0.01	0.001																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Mg		0.0010		0.002	0.002	0.001	0.002	0.002	0.0020	0.0030	0.0010				0.002					0.002																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Mn	0.0001	0.0030	0.001	0.005	0.005	0.001	0.005	0.0050	0.0050	0.0100	0.0020	0.005	0.0001	0.0002	0.005	0.005	0.005	0.005	0.005																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Ni	0.1	0.0005	0.10	0.005	0.008	0.005	0.01	0.005	0.005	0.0050	0.0040	0.005	0.05	0.0003	0.01	0.05	0.1	0.005	0.005																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
P	0.0003			0.001	0.002	0.001	0.001								0.001					0.001																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Pb	0.0001	0.0020	0.001	0.0004	0.0005	0.001	0.0005	0.0050	0.0100	0.0060	0.0040	0.001	0.0003	0.0002	0.0005	0.0005	0.005	0.005	0.001	0.0001																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
S	0.0010	0.0050	0.001	0.001	0.002	0.001	0.001	0.007	0.010	0.0050	0.0050	0.04	0.001	0.0002	0.001	0.0005	0.010	0.04	0.00																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Sb	0.0004			0.0003	0.0005	0.0003	0.0006								0.0006					0.0006																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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Si		0.0010	0.001	0.003	0.003	0.001	0.003			0.0010	0.0010				0.003					0.003																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Sn				0.0003	0.0005	0.0003	0.0003								0.0005					0.0001																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Zn	0.0010	0.0025	0.002	0.002	0.003	0.001	0.002	0.0050	0.0050	0.0070	0.0050	0.001	0.0004	0.0002	0.002	0.0005	0.005	0.005	0.001	0.002																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Tons **	1500	1800	2000	4500	1200	1000	1000	2000	2000	8500	6500	5200	2000	2000	2000	5400	3000	15,000	2000																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Shape*	R	BC	CC	CC	CC	CC	CC	BC	BC	BC	BC	CGP	CC	CC	CC	BR	BR	CGP	CC																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										

Shape \* CC = Cut Cats. BC = Broken Cats. N = Ingots. R = Rounds. BR = Briquettes. CGP = Coarse Grain Powder  
 Tons \*\* Estimated total tons for each brand at time of listing. <<< = Tons combined same producer other brands  
 No entry next to an element means "not reported".  
 Analysis: Cobalt minimum; Impurities maximum.

Brands highlighted in blue are suspended - new warrants cannot be created for these brands

Brands in orange are delisted - new warrants cannot be created for these brands