

Quality Metals Since 1789



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Replacing the Vale INCO S / R Rounds

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Background

Vale Nickel has announced that S Round and R Round products will no longer be produced

- Current S/R Round users will soon be unable to obtain these products for use and must consider using alternatives.
- Vale Plant in Manitoba that produces the S and R Rounds will be closed.
 - Declining mineral resources in the region
 - New Federal Emissions Standards in 2015 which would have required significant investment
- Operations will be moved to Sudbury, Canada and Clydach, UK location utilizing a Carbonyl manufacturing process.
 - Carbonyl process results in different shaped anodes than the traditional rounds
 - Resulting chemistry in “new” anodes will also vary from traditional Rounds
- Carbonyl Nickel is produced by refining impure nickel through a gaseous state to remove the impurities.
 - Carbonyl products will contain higher carbon levels
 - Spherical shape required for output

Timeframe

- Vale S Rounds will be phased out by **mid-2013**
- Vale R Rounds will be phased out by the **end of 2013**
- No firm dates have been provided by Vale – only the above guidelines.
 - Signs have been pointing to the “cut-off” possibly occurring sooner

January 2013						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

February 2013						
S	M	T	W	T	F	S
						1 2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

March 2013						
S	M	T	W	T	F	S
					1 2	
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

April 2013						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

May 2013						
S	M	T	W	T	F	S
		1	2	3	4	
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

June 2013						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

July 2013						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

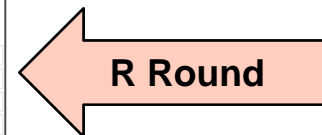
August 2013						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

September 2013						
S	M	T	W	T	F	S
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8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

October 2013						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

November 2013						
S	M	T	W	T	F	S
					1 2	
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

December 2013						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				



Options for Replacing the Inco R Round

Options	Inco Chip	Inco P Pellet	1x1" Cathode	Xstrata Crown
Notable Changes	<ul style="list-style-type: none"> - Carbonyl product - Flattened pellet - Produced by Inco in UK - Increased sludge from higher carbon content 	<ul style="list-style-type: none"> - Carbonyl product - Produced by Inco in UK - Reduced bridging due to spherical shape - Higher packing density (5.24 kg/L to 4.32 for R Rounds) - Increased sludge from higher carbon content - Smaller basket mesh size is recommended (1/4 x 3/8") 	<ul style="list-style-type: none"> - Virgin Electrolytic nickel - Produced in Russia/Finland by Norilsk - Reduced packing density 	<ul style="list-style-type: none"> - Similar button shape as R Round - Produced by Xstrata in Norway - Equivalent performance as R Round
Typical Chemistry	<p>Ni -- >99.9800 Co -- <0.0002 Cu -- <0.0004 C -- <0.0070 Fe -- <0.0001 S -- <0.0001 Pb - <0.0001 Zn - <0.0001</p>	<p>Ni -- >99.9800 Co -- <0.0002 Cu -- <0.0004 C -- <0.0070 Fe -- <0.0001 S -- <0.0001 Pb - <0.0001 Zn - <0.0001</p>	<p>Ni -- >99.9400 Co -- <0.0394 Cu -- <0.0004 C -- <0.0070 Fe -- <0.0002 S -- <0.0024 Pb - <0.0001 Zn - <0.0001</p>	<p>Ni -- >99.9800 Co -- <0.0002 Cu -- <0.0001 C -- <0.0020 Fe -- <0.001 S -- <0.0020 Pb - <0.0002 Zn - <0.0002</p>



Options for Replacing the Inco S Round

Options	Inco S Pellet	Xstrata D Crown
<p>Notable Changes</p>	<ul style="list-style-type: none"> - Carbonyl product - Produced by Inco in UK - Reduced bridging due to spherical shape - Higher packing density (5.24 kg/L to 3.81 for S Rounds) - Increased sludge from higher carbon content which may require bags to be changed more often - Smaller basket mesh size is recommended (1/4 x 3/8") - **No S Chip Available 	<ul style="list-style-type: none"> - Similar button shape as S Round - Produced by Xstrata in Norway - Equivalent performance as S Round - Sulfur activation comparable to S Round - Can be used interchangeably with S Round
<p>Typical Chemistry</p>	<p>Ni -- >99.900 Co -- <0.0001 Cu -- <0.0001 C -- <0.0050 Fe -- <0.0040 S -- <0.019 – 0.025 Pb - <0.0001 Zn - <0.0001</p>	<p>Ni -- >99.9500 Co -- <0.0002 Cu -- <0.0009 C -- <0.0020 Fe -- <0.001 S -- 0.0175 – 0.030 Pb - <0.0001 Zn - <0.0001</p>



Cost Variance

- R Round Transition
 - Minimal change in cost to transition to P Pellet or Chip.
 - 1x1" Cathode will remain a less expensive option.
- S Round Transition
 - Xstrata D Crowns have historically been less expensive than S pellets
 - Transition to S Pellets may include additional cost of new baskets to account for smaller size.
 - Consider additional basket maintenance due to sludging with S Pellets.
- Your Nathan Trotter rep can provide you with current pricing on all options for your evaluation.

Things to Consider

- Actual Transition Date
- Availability of S Rounds while you are transitioning. Check with Nathan Trotter to stay apprised of short and long term supply
- Determine specification or approval requirements with quality department. NT can provide samples of any or all alternative products as required.
- Consider any additional costs or savings
- Start trials sooner rather than later