



REFERENCE LIST OF RECTIFIERS INSTALLED IN SOUTHERN AFRICA AND WORLDWIDE (*Compact Rectifiers in Italics*)

<u>Year</u>	<u>Customer</u>	<u>Rating</u>	<u>Application</u>	<u>Qty</u>
2010	<i>Alstom - Canada</i>	<i>7kA 40Vdc</i>	<i>Test bay</i>	<i>1</i>
2010	Boss Mining (ENRC) – TWP Projects – DRC	26kA 207Vdc	Copper	2
2010	<i>Perstima - Malaysia</i>	<i>1kA 56Vdc</i>	<i>Cleaning</i>	<i>2</i>
2010	Mogale Alloys – South Africa (Control Upgrade)	PEC800 Controller	DC Arc Furnace	1
2010	<i>Eskom – Rand Technical Services – South Africa</i>	<i>2.9kA 48Vdc</i>	<i>Electrolysis</i>	<i>1</i>
2010	<i>Portovesme SRL – Italy</i>	<i>25kA 15Vdc</i>	<i>Copper Electrolysis</i>	<i>1</i>
2010	Rio Tinto - Palabora Mining Company – South Africa	16kA 145Vdc	Copper	1
2009	Konkola Copper Mines - Nkana – Zambia	25kA 400Vdc PCR	Copper	1
2009	Exxaro – Zincor Rectifier Upgrade– South Africa	30KA 750Vdc	Zinc	1
2009	<i>Moneypoint Power Station – Ireland</i>	<i>5.2kA 50Vdc</i>	<i>Water Desalination</i>	<i>1</i>
2009	<i>Omega Chemicals – Australia</i>	<i>50A 510Vdc</i>	<i>Polarisation</i>	<i>1</i>
2009	<i>Shell – Singapore</i>	<i>1.35kA 135Vdc</i>	<i>Sea water chlorination</i>	<i>2</i>
2009	Tosoh – Greece	8.8KA 480Vdc	Chemical	1
2008	Namakwa Sands – South Africa (Control Upgrade)	PEC800 Controller	DC Arc Furnace	1
2008	<i>LG Chem – South Korea</i>	<i>110A 300Vdc</i>	<i>Polarisation</i>	<i>1</i>



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2008	KMT – Democratic Republic of Congo	60kA 185Vdc	Copper	2
<i>2008</i>	<i>Amplats BMR Expansion – South Africa</i>	<i>16.5kA 40Vdc</i>	<i>Nickel</i>	<i>3</i>
2008	Amplats BMR Expansion – South Africa	21kA 715Vdc	Nickel	3
2007	Mopani Copper Mines – Mufulira - Zambia	2 x 12.5kA 300Vdc Air	Copper	1
<i>2007</i>	<i>Neyrtec – France</i>	<i>12kA 40Vdc</i>	<i>Chemical</i>	<i>2</i>
<i>2007</i>	<i>Latvia</i>	<i>1.7kA 460Vdc</i>	<i>Platinum Refinery</i>	<i>2</i>
<i>2007</i>	<i>Samancor- Middleburg Ferrochrome – South Africa</i>	<i>20kA 12Vdc</i>	<i>Arc Compensation</i>	<i>1</i>
<i>2007</i>	<i>Acerinox – Spain</i>	<i>4.5kA 35Vdc</i>	<i>Steel</i>	<i>8</i>
2007	Sublime Technologies – South Africa	70kA 800Vdc Diode	Silica Carbide	1
<i>2007</i>	<i>US Steel – Smederevo Serbia</i>	<i>1.6kA 250Vdc</i>	<i>Power Supply</i>	<i>2</i>
<i>2007</i>	<i>Tata Tinplate - India</i>	<i>4.5kA 33Vdc</i>	<i>Tinplate</i>	<i>24</i>
<i>2007</i>	<i>Tata Tinplate - India</i>	<i>4kA 33Vdc</i>	<i>Tinplate</i>	<i>2</i>
<i>2007</i>	<i>Tata Tinplate - India</i>	<i>4kA 33Vdc Bipolar</i>	<i>Tinplate</i>	<i>8</i>
2007	Chemaf – Democratic Republic of Congo	43kA 140Vdc	Copper	1
2007	Impala Platinum – South Africa	20kA 95Vdc	Copper	1



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2007	Samancor - Middleburg Ferrochrome – South Africa	90kA 850Vdc	DC Arc Furnace	1
2007	NCP - Chlor Alkali – South Africa	17.6A 460Vdc	Chlorine	2
<i>2006</i>	<i>Canfield – USA</i>	<i>750A 400Vdc</i>	<i>Battery Charging</i>	<i>1</i>
<i>2006</i>	<i>Kemira Eagle – Finland</i>	<i>800A 300Vdc</i>	<i>Polarisation</i>	<i>1</i>
2006	Amplats – South Africa	18kA 500V Reversible	Copper or Nickel	1
2006	Mopani Copper Mines – Mufulira - Zambia	25kA 300Vdc PCR Air	Copper	1
2006	Mopani Copper Mines – Nkana - Zambia	15kA 260Vdc	Copper	1
<i>2006</i>	<i>Mineração Caraiba S/A</i>	<i>9kA 60Vdc</i>	<i>Copper</i>	<i>2</i>
2006	Sublime Technologies – South Africa	70kA 800Vdc	Silica Carbide	1
<i>2006</i>	<i>Essar Steel – India</i>	<i>8kA 37Vdc Bipolar</i>	<i>Steel processing</i>	<i>2</i>
2006	Konkola Copper Mines - Konkola – Zambia	36kA 200Vdc	Copper	1
<i>2006</i>	<i>Rustenburg Platinum Mines (AMPLATS) – South Africa</i>	<i>10kA 10Vdc</i>	<i>Nickel</i>	<i>1</i>
<i>2006</i>	<i>Metal Process Park – South Africa</i>	<i>30kA 40Vdc</i>	<i>Copper Production</i>	<i>1</i>
<i>2006</i>	<i>El Abra – Chile</i>	<i>300A 360Vdc</i>	<i>Polarisation</i>	<i>4</i>
<i>2006</i>	<i>LG Chem – South Korea</i>	<i>110A 300Vdc</i>	<i>Polarisation</i>	<i>1</i>



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2006	<i>Karlshamn - Sweden</i>	<i>6.6kA 560Vdc</i>	<i>Electrolysis</i>	<i>1</i>
2006	Mopani Copper Mines - Mufulira – Zambia	25kA 300Vdc Air	Copper	1
2005	Lonmin Platinum – South Africa	13.5kA 42Vdc	Copper	2
<i>2005</i>	<i>Tinplate Company India Ltd – India</i>	<i>4kA 24Vdc</i>	<i>Tinning</i>	<i>8</i>
2005	Mopani Copper Mines - Mufulira – Zambia	25kA 300Vdc PCR Air	Copper	2
2005	Konkola Copper Mines - Konkola – Zambia	36kA 400Vdc	Copper Production	1
2005	Mopani Copper Mines - Nkana – Zambia	15kA 260Vdc	Copper	2
2005	Zinifex – Australia	13kA 790Vdc	Zinc	1
2005	GRD Minproc - Kansanshi – Zambia	60kA 185Vdc	Copper	2
<i>2005</i>	<i>Du Pont - USA</i>	<i>6kA 50Vdc</i>	<i>Electrolysis</i>	<i>1</i>
<i>2005</i>	<i>Sierra Miranda – Chile</i>	<i>10kA 66Vdc</i>	<i>Electrowinning</i>	<i>1</i>
<i>2005</i>	<i>Escondida – Chile</i>	<i>500A 315Vdc</i>	<i>Polarisation</i>	<i>4</i>
<i>2005</i>	<i>Spence – Chile</i>	<i>500A 260Vdc</i>	<i>Polarisation</i>	<i>3</i>
<i>2005</i>	<i>Klymiuk – Austria</i>	<i>100A 400Vdc</i>	<i>Food Industry</i>	<i>1</i>
<i>2005</i>	<i>Akzo Nobel – Netherlands</i>	<i>140A 350vdc</i>	<i>Polarisation</i>	<i>1</i>



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2004	Impala Platinum – South Africa	20kA 95Vdc	Copper	1
<i>2004</i>	<i>Hanwha – South Korea</i>	<i>50A 480Vdc</i>	<i>Polarisation</i>	<i>6</i>
2004	Amplats – South Africa	18kA 500V Reversible	Copper or Nickel	1
<i>2004</i>	<i>Parikh Steel – India</i>	<i>4kA 24Vdc</i>	<i>Steel Production</i>	<i>28</i>
<i>2004</i>	<i>Parikh Steel – India</i>	<i>4kA 24Vdc Bipolar</i>	<i>Steel Production</i>	<i>4</i>
<i>2004</i>	<i>Orna Steel – Malaysia</i>	<i>3kA 35Vdc Bipolar</i>	<i>Steel Production</i>	<i>3</i>
<i>2004</i>	<i>Norsk Hydro – Venezuela</i>	<i>5.15kA 203Vdc Air</i>	<i>Hydrogen Production</i>	<i>2</i>
2004	Chambishi Metals – Zambia	23kA 500Vdc	Copper Production	1
2004	Northam Platinum – South Africa	15kA 65Vdc	Copper Production	1
2004	Konkola Kopper Mines – Zambia	18kA 200Vdc	Copper Production	2
<i>2004</i>	<i>MDM - Svartliden Gold – Sweden</i>	<i>1kA 12Vdc</i>	<i>Gold plating</i>	<i>2</i>
<i>2004</i>	<i>Baoxin – China</i>	<i>12kA 35Vdc</i>	<i>Annealing &amp; Pickling</i>	<i>10</i>
<i>2004</i>	<i>Hoganas – Sweden</i>	<i>6.6kA 560Vdc</i>	<i>Electrolysis</i>	<i>2</i>
<i>2003</i>	<i>Sidor – Venezuela</i>	<i>5kA 24Vdc</i>	<i>Pickling and cleaning</i>	<i>5</i>



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2003	<i>Sidor – Venezuela</i>	<i>5kA 36Vdc</i>	<i>Chroming</i>	11
2003	GRD Minproc - Kansanshi – Zambia	60kA 185Vdc	Copper	2
2003	Impala Platinum – South Africa	20kA 95Vdc	Copper	2
2003	<i>Kemira – Finland</i>	<i>6kA 30Vdc</i>	<i>Electrolysis</i>	1
2003	<i>RBL Engineering – South Africa</i>	<i>200A 400Vdc</i>	<i>Paint application</i>	1
2001/2	Iscor Vanderbijlpark – South Africa	13.8kA 750Vdc	DC Drive	3
2001	Iscor – Zincor Springs – South Africa	30kA 750Vdc	Zinc	1
2001	Anglo American / NAMZINC - Skorpion Project –Namibia	4 x 55kA 370Vdc	Zinc	1
2001	SASOL – Chlorine Expansion Project, Sasolburg – South Africa	20kA 540Vdc	Chlorine	1
2000/1	Anglo American - Smelterco Nkana – Zambia	25kA 350Vdc PCR	Copper	2
2000/1	Mopani Copper Mines - Mufulira – Zambia	14.5kA 160Vdc	Copper	1
2000/1	Iscor Vanderbijlpark – South Africa	13.8kA 750Vdc	DC Drive	1
1999	Sappi Ngodwana – South Africa (Control Upgrade)	50kA 120V	Chlorine	1
1999	Anglo Vaal Minerals – South Africa	18.6kA 210V	Cobalt	1
1999	Anglo Vaal Minerals – South Africa	80kA 1200V	DC Arc Furnace	1



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1999	Mondi Richards Bay – South Africa (Control Upgrade)	75kA 120V	Chlorine	1
1999	JCI – South Africa	0.6kA 2500V	Plasma Arc Furnace	2
1998	Illovo Sugar – South Africa	4kA 404V	Hydrogen Electrolysis	1
1998	Norsk-Hydro – Malaysia	5.15kA 156V	Hydrogen Electrolysis	1
1998	Norsk-Hydro - Afrox – South Africa	5.15kA 133V	Hydrogen Electrolysis	1
1998	Goldfields - Zincor 2 – South Africa	30kA 750V	Electro-Chemical Zinc	1
1998	Anglo American Co. – South Africa	80kA 750V	DC Arc Furnace	1
1997	Lurgi Karbochem – South Africa	50kA 120V	Chlorine	1
1996	Amplats – South Africa	18kA 500V Reversible	Copper or Nickel	1
1996	Goldfields - Zincor – South Africa	30kA 750V	Electro-Chemical Zinc	1
1995/96	Middelburg Ferro-chrome – South Africa	80kA 800V	DC Arc Furnace	1
1995/96	Hartley Platinum – Zimbabwe	29kA 31V	Copper	1
1995/96	Hartley Platinum – Zimbabwe	24kA 80V	Nickel	1
1995/96	MMC Nelspruit – South Africa	28kA 580V	Manganese	1
1995	MMC Krugersdorp – South Africa	36kA 200V	Manganese	1



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1994	Randcoal – South Africa	3kV DC 1,5kA	Traction Subs.	1
1994	Mondi Richards Bay – South Africa (Control Upgrade)	97kA 74V	Chlorine	1
1993/94	Anglo American Co. – South Africa	10kA 60V	Stirring Rectifier	1
1993/94	Anglo American Co. – South Africa	64kA 700V	DC Arc Furnace	1
1992	Air Products – South Africa	6,6kA 542V	Hydrogen	1
1991	AECI – South Africa	50kA 142V	Chlorine	1
1990/91	Goldfields – South Africa	15kA 65V	Copper	1
1990/91	Fedgas – South Africa	6kA 100V	Hydrogen	1
1990	AECI – South Africa	50kA 142V	Chlorine	1
1989/90	Alusaf – South Africa	Rectifier Unit Control	Aluminium	6
1989	AEI/Lurgi – South Africa	6,6kA 281V	Hydrogen	1
1988/89	Palmiet Ferrochrome – South Africa	60kA 780V	DC Arc Furnace	2
1988	Alusaf – South Africa	31,5kA 1,05kV	Aluminium	1
1987/88	Alusaf – South Africa	25kA 80V	Aluminium	1
1987/88	Spoornet – South Africa	1,5kA 3kV	Traction Subst.	6



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1987	Iscor, Pretoria – South Africa	2kA 440V	DC Supply	1
1987	Eskom, Kendal – South Africa	4kA 40V	Hydrogen	1
1987	GEC – South Africa	1,5kA 3kV	Traction Subst.	4
1986/87	Eskom, Matimba – South Africa	4kA 40V	Hydrogen	1
1985/86	G.E. – South Africa	3,3kA 1,2kV	Traction Subst.	2
1985/87	Spoornet – South Africa	1kA 3kV	Traction Subst.	44
1985/89	Babcock, Eskom – South Africa	3A 75kV	Precipitator units	168
1983	Eskom, Koeberg – South Africa	1kA 25V	Hydrogen	1
1982	Iscor, Grootegeluk – South Africa	1,4kA 1,75kV	Traction Subst.	4
1981/82	Iscor, Sishen – South Africa	1,4kA 2kV	Traction Subst.	36
1981	EMSA – South Africa	110kA 240V	Furnace	1
1981	Rustenburg BMR – South Africa	15kA 385V	Copperwinning	3
1980	Iscor, Goedehoop – South Africa	1,4kA 1,75kV	Traction Subst.	1
1980/81	Spoornet – South Africa	1,33kA 3kV	Traction Subst.	14
1980	Iscor, Sishen – South Africa	1,4kA 1,75kV	Traction Subst.	3



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1979	Smithchem – South Africa	4kA 50V	Hydrogen	1
1978	S.A. Oil Mills – South Africa	13kA 75V	Hydrogen	1
1977	Afrox – South Africa	4kA 50V	Hydrogen	1
1976	EMSA – South Africa	100kA 240V	Furnace	1
1975/78	Spoornet – South Africa	1,33kA 3kV	Traction Subst.	39
1971/73	Alusaf – South Africa	186kA 1,05kV	Aluminium	6