

- TABLE OF CONTENTS -

	Executive Summary	6
I	Introduction	9
1.1	Summary	9
1.2	Content	9
1.3	Approach to the study	10
1.4	Abbreviations	10
II	Aluminium Dross: Process and Processing Technologies	11
2.1	Aluminium dross: An Overview	11
2.2	Types of aluminium dross	12
2.2.1	White dross	12
2.2.2	Black dross	14
2.3	Aluminium dross processing	15
2.3.1	Importance of aluminium dross and dross recycling	15
2.3.2	Aluminium dross processing technologies	16
2.3.3	Technological evolution of aluminium dross processing	17
2.4	Types of aluminium dross processing	19
2.4.1	On-site processing	19
2.4.2	Off-site processing	22
2.5	Select suppliers of aluminium dross processing technologies	25
2.6	Salt cake (Salt slag)	26
2.6.1	Salt slag treatment	27
III	Aluminium Dross Recycling: A Global Perspective	29
3.1	Overview	29
3.1.1	World aluminium industry	29
3.1.2	Dross generation, recovery and recycling	31
3.2	North America	32
3.2.1	Aluminium industry	32
3.2.2	Dross: Generation, recovery and processing	33
3.3	Latin America	34
3.3.1	Aluminium industry	34
3.3.2	Dross: Generation, recovery and processing	35
3.4	Europe	36
3.4.1	Aluminium industry	36

3.4.2	Dross: Generation, recovery and processing	36
3.5	Asia Pacific	39
3.5.1	Aluminium industry	39
3.5.2	Dross: Generation, recovery and processing	39
3.6	Middle East & Africa	40
3.6.1	Aluminium industry	40
3.6.2	Dross: Generation, recovery and processing	42
3.7	Aluminium dross trade	44
3.7.1	Import of aluminium dross	44
3.7.2	Export of aluminium dross	46
Appendix I	List of select suppliers of dross processing technology and related equipment	47
Appendix II	Brief profiles of select suppliers of aluminium dross processing technology and related equipment	48
1	ALTEK Europe Ltd., UK	48
2	BEFESA Aluminium, Spain	49
3	DIDION International Inc., USA	50
4	Foshan Brightstar Aluminium Machinery Co., Ltd., China	51
5	Foshan Metech Aluminium Technology Co. Ltd., China	52
6	Foshan Nanhai Nenghong Machinery Factory, China	52
7	GLAMA Maschinenbau GmbH, Germany	53
8	Mechatherm International Ltd., UK	54
9	Melting Solutions Ltd., USA	54
10	Mecfor Inc, Canada	55
11	MFS Systems Inc., Canada	56
12	PyroGenesis Inc., Canada	56
13	Pyrotek, USA	57
14	Runsun Metallurgical Equipment Co., China	58
15	Sanwa Corp. (Sanshin Sanwa Group), Japan	58
16	STAS Inc., Canada	59
17	T.T. Tomorrow Technologies spa, Italy	60
18	TAHA International Corporation, Bahrain	60

LIST OF TABLES

E.1	World: Dross generation and recovery, 2016 & 2017 (000 tonnes)	8
2.1	White dross: Aluminium metal content (illustrative)	13
2.2	White dross: Physical and chemical properties (illustrative)	13

2.3	Black dross: Aluminium metal content (illustrative)	14
2.4	Black dross: Physical and chemical properties (illustrative)	14
2.5	Select suppliers of dross processing technology and related equipment	25
2.6	Composition of salt cake	26
2.7	Salt cake (salt slag) processors: Select companies	28
3.1	World: Dross generation & recovery across region, 2017 (000 tonnes)	32
3.2	North America: Dross generation and recovery, 2016 & 2017 (000 tonnes)	33
3.3	Latin America: Dross generation and recovery, 2016 & 2017 (000 tonnes)	35
3.4	Europe: Dross generation and recovery, 2016 & 2017 (000 tonnes)	37
3.5	Iceland: Dross generation (values in tonnes unless otherwise specified)	38
3.6	Asia Pacific: Dross generation and recovery, 2016 & 2017 (000 tonnes)	40
3.7	Middle East & Africa: Dross generation and recovery, 2016 & 2017 (000 tonnes)	42
3.8	Import of aluminium dross, 2014-2016 (tonnes)	44
3.9	Export of aluminium dross, 2014-2016 (tonnes)	46

LIST OF CASE STUDIES

2.1	On-site aluminium dross processing plant – Bell Bay Aluminium Smelter	21
2.2	Befesa, Bernburg (Germany) offsite dross processing plant	24
3.1	Iceland - Primary aluminium industry, dross generation and processing	38

LIST OF FIGURES

E.1	World: Dross generation, 2017	7
E.2	Summary of world dross recovery in numbers, 2017 (000 tonnes)	8
2.1	Components of dross	11
2.2	Types of aluminium dross	12
2.3	Aluminium dross recycling process	17
2.4	Evolution of dross processing	18
2.5	Steps in on-site aluminium dross processing	20
2.6	Dross collection and storage	22
2.7	Steps in offsite aluminium dross processing	23
3.1	World primary aluminium production trend, 2013 to 2017 (million tonnes)	29
3.2	World primary and recycled aluminium production, 2017 (million tonnes)	30
3.3	Aluminium production across regions, 2017 (%)	30
3.4	Dross generation & recovery across region, 2017 (000 tonnes)	31
3.5	World: Dross generation, dross recovery and aluminium recovery - Sector wise contribution, 2017 (000 tonnes)	31
3.6	North America: Primary aluminium production, 2013 to 2017 (million tonnes)	32
3.7	North America: primary and recycled aluminium production, 2017 (million tonnes)	33
3.8	Dross generation and recovery in North America, 2017 (000 tonnes)	34
3.9	Latin America: Primary aluminium production, 2013 to 2017 (million tonnes)	34
3.10	Latin America: primary and recycled aluminium production, 2017 (million tonnes)	35
3.11	Dross generation vs recovery in Latin America, 2017 (000 tonnes)	35
3.12	Europe: Primary aluminium production, 2013 to 2017 (million tonnes)	36
3.13	Europe: Primary and recycled aluminium production, 2017 (million tonnes)	36
3.14	Dross generation vs recovery in Europe, 2017 (000 tonnes)	37
3.15	Asia Pacific: Primary aluminium production, 2013 to 2017 (million tonnes)	39
3.16	Asia Pacific: Primary and recycled aluminium production, 2017 (million tonnes)	39
3.17	Dross generation vs recovery in Asia Pacific, 2017 (000 tonnes)	40
3.18	Middle East & Africa: Primary aluminium production, 2013 to 2017 (million tonnes)	41
3.19	Middle East & Africa: Primary and recycled aluminium production, 2017 (million tonnes)	42 43
3.20	Dross generation vs recovery in Middle East & Africa, 2017 (000 tonnes)	44
3.21	Trend in import of aluminium dross, 2012 to 2016 (000 tonnes)	45
3.22	Dross: Major importing countries and their sources of imports, 2016	46
3.23	Dross: Major exporting countries and their export destinations, 2016	46