

Safety considerations in **E-Waste Management**

WSH Forum for Waste Management Industry 2023 Presented by: Fons Krist Singapore, 17 Nov 23

E-Waste is the fastest growing solid waste stream in the world

ALBA collects 6,000 – 7,000MT per year



Why is it important to recycle E-Waste?

Impact of not recycling E-Waste

- We are throwing away valuable resources
- The concentration metals and precious metals in E-Waste is much higher than in ore mined from the earth
- Steel, Copper, Aluminum
- Plastic
- Gold
- Silver
- Palladium

By extracting these materials from E-Waste, we are able to reduce the mining of such resources from our natural environment, thus reducing our environmental impact and ensuring we have enough for future generations.

TOKYO 2020 MEDAL COMPOSITIONS





Impacts of improper recycling of E-Waste

- Environmental leaching of chemicals to the environment
- Human Exposure to chemicals





What happens to E-Waste in Singapore

TYPES OF E-WASTE (BY WEIGHT)

1%

2% – Air canditioners 4%

Computers

1%

machine

32%

(BY WEIGHT)

Refrigerators 27%

E-WASTE DISPOSAL PATTERN

Traded-

Re-sol

24%

Mobile phones

1%

Audio/video equipment

Sent for recycling* 6%

Donated* 9%

Others

10%



generated a year in Singapore.

Airbus A380 airplanes.

This is equivalent to the weight of 220



About 11 kg of e-waste — equal in weight to 73 mobile phones — is discarded by each person a year in Singapore.

An NEA survey found that 60% of consumers said they don't know or are unsure of how to recycle their e-waste. E-waste (from consumers) is normally:



* Sent for recycling refers to e-waste deposited into e-waste recycling bins by consumers. ** Donated refers to e-waste given to charity organisations or others. + Thrown away refers to e-waste discarded with general waste or left at common areas.

Channelling e-waste to reputable e-waste recyclers will benefit the environment and the public, as this:



¹ Balde, C.P., Forti, V., Gray, V., Kuehr, R., Stegmann, P. (Dec 2017) The Global E-waste Monitor 2017. (http://collections.unu.edu/eserv/UNU:6341/Global-E-waste Monitor 2017 electronic single pages .pdf)



Extended Producer Responsibility (EPR)

Producers bear the
responsibility for the
collection and treatment
of their products when
they reach end-of-life



Resource Sustainability Act

urce Sustainability Act 2019 🗙 🕂	V -	-
C 🏠 🔒 sso.agc.gov.sg/Acts-Supp/29-2019	오 🕺 🖻 🕁 🔲	. (
A Singapore Government Agency Website		
Singapore	FAQs Feed	back
Statutes	A- //	A+
Onnie		_
Home Browse • What's New • Help •	About Us 🛛 My Collections Q. Sear	ch
	р q	0
Status: Published in Acts Supplement		
on 04 Oct 2019	REPUBLIC OF SINGAPORE	
Resource Sustainability Act 2019	COVERNMENT CAZETTE	
Table of Contents	ACTS SUDDI EMENT	
Resource Sustainability Act 2019	ACTS SUFFLEMENT	
(No. 29 of 2019)	Published by Authority	
Long Title		
Enacting Formula	NO. 36] FRIDAY, OCTOBER 4 [20)19
Part 1 PRELIMINARY		
1 Short title and commencement	The following Act was passed by Parliament on 4 September 2019 and assented to by the President on 2. September 2019 —	3
2 Interpretation		
3 Purposes of Act	DESCLIDEE SUSTAINADILITY ACT 2010	
Part 2 APPLICATION AND ADMINISTRATION	RESOURCE SUSTAINABILITT ACT 2019	
5 Administration of Act	(No. 29 of 2019)	
Part 3 ELECTRICAL AND ELECTRONIC WASTE		
Division 1 — Application and interpretation	I assent.	
6 Application to regulated products		
7 Interpretation of this Part	HALIMAH YACO	θВ,
Division 2 — Registration of producers	Preside	ent.
8 Unauthorised supply of regulated products	23 September 20.	19.
9 Registration of producers	Date of Commencement: 1 January 2020 Parts 1, 2, Divisions 1 and 2 of Part 3, section 18, Parts 6, 7,	8
 10 Duration, cancellation and revocation of registration 	, and the Schedule	
Reset Get Provisions Whole Document	Date of Commencement: 1 July 2020 Part 4 Date of Commencement: 1 July 2021 Sections 12 and 13, Division 4 of Part 3, sections 16 and 17	

PRS License



40 Scotts Road #13-00 Environment Building Singapore 228231 www.nea.gov.sg

PRODUCER RESPONSIBILITY SCHEME LICENCE

Name of Licensee:	ALBA E-waste Smart Recycling Pte Ltd.		
Address of Licensee:	20 Tuas Loop		
	Singapore 637350		
Licence Effective Date:	1 July 2021		
Date of Issue:	30 June 2021	Date of Expiry:	30 June 2026
Tender Ref No.:	NEA000ETT20300052	Licence No.:	PRS2021001

Licence fee payable on issue: S\$4,907.00

PURSUANT TO THE TENDER FOR THE LICENCE TO OPERATE A PRODUCER RESPONSIBILITY SCHEME AWARDED TO THE ABOVE-MENTIONED COMPANY (HEREINAFTER REFERRED TO AS THE "COMPANY") -

The National Environment Agency, in exercise of the powers conferred on it under Section 29 of the Resource Sustainability Act 2019, hereby grants to the Company a licence subject to the terms and conditions set out in Appendix 1 of Part 1 of the Tender documents (Ref: NEA000ETT20300052).

Dated the 5th of July 2021

Director of the Waste Management Division National Environment Agency

Page 1 of 1



ALBA E-Waste Producer Responsibility Scheme Operator



ALBA's Responsibilities as E-Waste PRS Operator



Develop programs to encourage the public to recycle e-waste;



Provide a variety of e-waste collection avenues for e-waste recycling (e.g., e-waste receptacles in public areas, scheduled collection drives and ad-hoc door-step collection services);



Collect and transport the e-waste to NEA-licensed e-waste recyclers; and

Q

Audit E-waste recyclers to ensure the highest Environmental, Health, and Safety standards

Set up a data management system to track and report to NEA the amount of e-waste collected for treatment.





Regulated consumer products

Printers with weight of 20kg or less

Consumer Computer

Desktop Monitors

Mobile Telephones

Router that is not a specified router

Modems

Set-top Boxes

EMC Class B Network Switches

Network Hubs with 8 or fewer ports

Refrigerators

Washing Machines

Dryers

Televisions

Air-conditioners

Electric Mobility Devices

Portable Batteries

Consumer Electric Vehicle Batteries

Consumer Lamps



ICT Equipment



Batteries

Large Household Appliances



Electric Mobility Devices





Lightbulbs





Different Collection Schemes

E-Bins



Battery and Bulb Bins



E-Drives









E-Bin Coverage

Description	Collection Name	TOTAL
ICT / Bulb / Battery	3 in 1 Bin	
Battery	Battery Bin	More than
Bulb / Battery	BB Bin	600 collection
Bulb / Battery	BB Bin (Tube)	points
Consolidated Collection	1100L MGB	set up
Manned Counter Collecti	on (in-store)	





IT-System

	=					Entities			
User Account © Livita Account: ALBA ac #N Afr Air Are June and J	Produc	cer (169) Town Counci	1& MCST (0)	Other (0) Non-Residential (0	Rec	syclers (10) Site Owner	s (0) Reside	ntal (1)	
ia Ipt. Inu. Ies. Ar. Ivi I	Entiti	HCS + AUTHORY	1.242					& owner Printer	B tage sension
AL 04 ~	0	Name Seanth	40	Status Select	\$3	Type(s) Select	\$3 -	Producer Account E-Mail	
	<u>a</u> .	Deniz Test		Active -+		Producer		demzylkliz@evreka.co	÷
Operation Manage	0	Producer Account 35174		Active ~		Producer			1
	G. (Producer Account 35173		Activa 🛩	-	Producer			1
seer throughment 2	0	Producer Account 35172		Adre w		Producer			I.
Acset Management. >	0	Producer Account 35171		Aethra 🔶		Producer			8
	0	Producer Account 35170		Active w		Producer			I.
	0	Producer Account 35169		Autre 👻		Producer			Ŧ
Events 🐵	0	Producer Account 35168		Jative 🐱		Producer			1
	53,	Producer Account 35167		Active 🛩		Producer			ŧ
secondo Managem	0	Producer Account 35166		Active 🗢		Producar			1
								text/er/ege 10 - 1-10/0 ⁴ 10	o Denni 🤇 🔁





						Assets				
Assets +	Add Artist							Ve Coordina	C. Pep	017
Name	¢I	Status Select	\$E	Service Location	ŧ5	Asset Type	¢Ξ	Operations Select	‡≣ ↓	Tag
6-000013		On Fi	ska	PA. West Coast CC		6-3in1 Housing				6.000

1

02007	In Vehicle - Full		6-3h1 Housing	6-000007	89	
00006	ON HAR	Gain City, Marina Square	6 - 3mt Housing	6-000006	- 64	
02005	Om Flekt	Stopping Centre, MM	6-3in1 Housing	6-000005	37	
00420	On Hide	PA. Bukit Purmel Zone A RC	6 - 3int Housing	6-000420	72	
00419	On Field	School .01E College West	6 - 3int Housing	6-000419	0	
00418	On Field	Storoping Centre Battles City Shapping Centre	6 - 3in1 Housing	6-000418	75	
00417	OnTide	PA, Braddell Heights Zone C BC	6 - 3in1 Housing	6.000417	23	
00416	On Field	Government Yusof Ishak Institute	6-3in1 Housing	6-000416	19	
00415	On Field	ER, Dedok Reservoir-Punzzol Caroestew RC	6- Jin1 Housing	6-000415	-1	

monipole ange 10 - 1-10 of 316 berris (

Q 🔄 🖈 🔲 🔞 (upan

.

9

in tane bernigs III Man vie

1 Fullness Rate



Outreach Efforts





RECYCLE YOUR E-WASTE & EARN REWARDS.

REFERENCE KITAR SEMULA UNTUK GANJARAN 105-9186870 QUISCERST

GET REWARDED EACH TIME YOU RECYCLE YOUR E WASTE BY USING THE STEP UP SUSTAINABILITY APP.

ALBA D

THREE EASY TO GET REWAR

Earn CO₂ points each time you recycle with us through just three simple steps:



STEP UP

a reducent voucher

prizes from our pi

naty of which a

Snap a photo of your recyclables and make sure they have been aned beforehand.

Collect your CO2 points on the app and use them to



What safety measures do we have in place for E-Waste **Transportation and** Storage

Biggest Concern, IT batteries & Flammable Refrigerant Gas

Batteries come in many different sizes and compositions



ALBA 💱

Innovative Features – E-Bin with Fill/Temperature Sensors





Assets + Advert Refere Refere <threfere< th=""> <th< th=""><th></th><th></th><th></th><th></th><th>Ass</th><th>ets</th><th></th><th></th><th></th></th<></threfere<>					Ass	ets			
Nome Statis Statis <th></th> <th>Assets + Add Acces</th> <th>E.</th> <th></th> <th></th> <th></th> <th>👷 Clear Fitters</th> <th>🕒 Export 🕞 Import 🛞 Table Settings </th> <th>00 M</th>		Assets + Add Acces	E.				👷 Clear Fitters	🕒 Export 🕞 Import 🛞 Table Settings	00 M
1058 6.000352 00 Pield Harvey, Nacmano, Nachtholinis, Clay, 6 - 30 n1 Housing 66 38 196 6.000163 0.00 Pield Shooping, Centra, Gek Nah, Shooping, Centra, 6 - 30 n1 Housing 64 38 195 6.000194 0.01 Pield Shooping, Centra, Gek Nah, Shooping, Centra, 6 - 30 n1 Housing 64 27 1900 6.000194 0.01 Pield Shooping, Centra, Gek Nah, Shooping, Centra, 6 - 30 n1 Housing 64 27 1122 6.000162 0.01 Pield Shooping, Centra, Gek Nah, Shooping, Centra, 6 - 30 n1 Housing 64 27 66 6.000062 0.01 Pield Shooping, Centra, City, Shouping, Centra, 6 - 30 n1 Housing 64 23 195 6.000162 0.01 Pield Shooping, Centra, City, Shouping, Centra, 6 - 30 n1 Housing 61 28 196 6.00005 0.01 Pield Shooping, Centra, City, Shouping, Centra, 6 - 30 n1 Housing 60 28 108.1 6.00017 0.01 Pield Shooping, Centra, City, Shouping, Centra, 6 - 30 n1 Housing 51 28<		ID \$	Name \$	Status \$	Service Location \$	Asset Type \$1	Fullness Rate	Last Temperature \$ Stakeholder Service Point	1
398 6000106 0n Field Shooling Centre, Gel, Pab Shooling Centre, 6 - 3n1 Housing 6 28 1055 6000349 0n Field B. Massilanda CC 6 - 3n1 Housing 61 31 1000 6000194 0n Field Scorement, Massilanda CC 6 - 3n1 Housing 64 27 1122 600016 0n Field Scorement, Massilanda LC 6 - 3n1 Housing 64 27 64 600022 0n Field Encrice, Massilanda CD 6 - 3n1 Housing 63 23 955 600012 0n Field Encrice, Massilanda EC 6 - 3n1 Housing 61 28 14 600008 0n Field Scorement, Massilanda EC 6 - 3n1 Housing 61 28 163 600017 0n Field Encrice, Massilanda EC 6 - 3n1 Housing 61 28 164 600008 0n Field Encrice, Massilanda EC 6 - 3n1 Housing 61 28 163 600017 On Field Scorent Eclife Scarent Massilanda 6 - 3n1 Housing 62 24 164 600018 On Field Scorent Eclife Clemaxsil 6	-	1058	6-000352	On Field	Harvey Norman, Northcoint City	6 - 3in1 Housing	66	25	
1035 6.000349 On Field P. Modellands, LS 6.3int Housing 65 31 1000 6.000194 On Field Gootmannet, Liner, L		398	6-000106	On Field	Shooping Centre, Gek Poh Shopping Centre	6 - 3in1 Housing	66	28	
1000 6000194 On Field Soverment, Taman Justice 2000eaing Sattle 6-3 int Housing 64 27 1122 600046 On Field Soverment, Yustel Istak Justice 6-3 int Housing 64 27 66 600002 On Field Saturation, Vustel Istak Justice 6-3 int Housing 63 23 995 6000102 On Field Saturation, Vustel Istak, Justice B Science 6-3 int Housing 60 25 144 600005 On Field Saturation, Saturation		1055	6-000349	On Field	PA. Woodlands CC	6 - 3in1 Housing	65	31	
1122 600016 On Field Geomment, Yuad Ishak Institute 6-3in 1 Housing 64 27 66 600002 On Field Batronse, Yuad Ishak Institute 6-3in 1 Housing 63 23 95 6000102 On Field Ditters, Coral Bis, EC - Basak Kootlam 6-3in 1 Housing 61 28 14 6-00008 On Field Bats Denki, Lincton E Shooting Centra; 6-3in 1 Housing 60 28 168 6-00007 On Field Shooting Centra; City Source, Mall 6-3in 1 Housing 60 28 1083 6-00007 On Field Shooting Centra; Lity Source, Mall 6-3in 1 Housing 60 28 1083 6-00019 On Field Earonse, Lith 6-3in 1 Housing 60 28 1083 6-000181 On Field School, Sent Fieldee Camous 6-3in 1 Housing 57 28 107 6-000181 On Field School, Sent Fieldee Camous 6-3in 1 Housing 56 28 1107 6-00025 On Field School, Sent Fieldee Camous 6-3in 1 Housing 55 26 1104 6-000298	2	1000	6-000194	On Field	Government, Taman lurong Shopping Centre	6 - 3in1 Housing	64	27	
66 6-000062 On Field Eurorise, ModSity 6-3in Housing 63 23 365 6-000102 On Field Sther, Coral Bis, RC - Besair, Koplian 6-3in Housing 61 28 14 6-000008 On Field Bast, Danki, Junction 8. Shooping, Canter, 6 6-3in Housing 60 25 59 6-000055 On Field Shooping Canter, City Souter, Mall 6-3in Housing 60 26 1083 6-0000377 On Field Shooping Canter, City Souter, Mall 6-3in Housing 60 26 23 6-00019 On Field Eurorise, LBM 6-3in Housing 58 24 947 6-000181 On Field School, Sent Ridge Campas 6-3in Housing 57 28 55 6-000181 On Field School, Sent Ridge Campas 6-3in Housing 55 28 1107 6-000181 On Field Counter, Tak Horein 6-3in Housing 55 26 1107 6-00041 On Field Counter, Tak Horein 6-3in Housing 55 26 1104 6-00079 On Field Schoop, Sente	×.	1122	6-000416	On Field	Government, Yusof ishak institute	6 - 3in1 Housing	64	27	
395 6-000102 0m Field Cherrs. Coral Bis KC-Breack Kootlaam 6-3in1 Housing 61 28 14 6-00008 0m Field Bast Denki, Lunction & Shoosing Centre 6-3in1 Housing 60 28 59 6-000055 0m Field Shooping Centre, City Soulare, Mall 6-3in1 Housing 60 28 1083 6-000377 0m Field Shooping Centre, City Soulare, Mall 6-3in1 Housing 60 28 1083 6-000377 0m Field Commercial, JEUH 6-3in1 Housing 60 28 1083 6-000191 0m Field Extension, JEM 6-3in1 Housing 58 24 907 6-000181 0m Field Shool, Stent Ridge Campas 6-3in1 Housing 57 28 108 6-000051 0m Field Shool, Stent Ridge Campas 6-3in1 Housing 56 28 1107 6-000051 0m Field Commercial, Jetere 6-3in1 Housing 55 26 1104 6-000076 0m Field Commercial, Alexandra Housing 6-3in1 Housing 54 27 1093 6-000076 0m Field		66	6-000062	On Field	Fairprice, VivoCity	6 - 3in1 Housing	63	23	
14 6.00008 0n Heid Bast Danki, Juction 8. Shoosing Carters 6.3 int Housing 60 25 59 6.000055 0n Heid Scopping Carters, City Source Mall 6.3 int Housing 60 28 1083 6.000377 On Heid Scopping Carters, City Source Mall 6.3 int Housing 60 26 23 6.000197 On Heid Extracta, JEM 6.3 int Housing 57 28 967 6.000181 On Heid School, Sent Ridge Carnous 6.3 int Housing 57 28 55 6.000051 On Heid School, Sent Ridge Carnous 6.3 int Housing 57 28 1107 6.000051 On Heid School, Sent Ridge Carnous 6.3 int Housing 55 22 1107 6.000011 On Field Courts, The Heerst 6.3 int Housing 55 26 1104 6.000398 On Field Scopping Centres, C	2	395	6-000102	On Field	Others, Coral Ris RC - Repair Kopitiam	6 - 3in1 Housing	61	28	
59 6-000055 On Field Shopping Centre, City, Source, Mall 6 - 3in1 Housing 60 28 1083 6-000377 On Field Commercial, J&Ud 6 - 3in1 Housing 60 26 23 6-00019 On Field Extrance, J&Ud 6 - 3in1 Housing 57 28 987 6-000181 On Field P5. Tampines Changkat Zone, B.BS 6 - 3in1 Housing 57 28 55 6-000051 On Field School, Sent, Bidge Campous 6 - 3in1 Housing 57 28 29 6-000051 On Field School, Sent, Bidge Campous 6 - 3in1 Housing 57 28 1107 6-000051 On Field School, Sent, Bidge Campous 6 - 3in1 Housing 55 22 1107 6-000010 On Field Commercial, Alexandra Housing 6 - 3in1 Housing 55 26 1104 6-000070 On Field School, Sentre, Central, Piaza 6 - 3in1 Housing 54 27 1053 6-000070 On Field Schopting Centre, Central, Piaza 6 - 3in		14	6-000008	On Reld	Best Denki, Junction 8 Shopping Centre	6 - 3in1 Housing	60	25	
1083 6-000377 On Field Commercial Jable 6-3in1 Housing 60 28 23 6-00019 On Field Earons.IEM 6-3in1 Housing 58 24 987 6-000181 On Field 28. Tampines Changkat Zone 8.BM 6-3in1 Housing 57 28 55 6-000051 On Field 28. Hillsex.CC 6-3in1 Housing 57 28 29 6-000051 On Field 28. Hillsex.CC 6-3in1 Housing 56 28 1107 6-00041 On Field 20. Littls.The Heeran 6-3in1 Housing 55 26 1104 6-000398 On Field Commercial.Alwandra Housing 55 26 349 6-00070 On Field School.sterts.Central Plaza 6-3in1 Housing 51 26 1053 6-00037 On Field School and Earse 2.8N 6-3in1 Housing 53 28		59	6-000055	On Field	Shopping Centre, City Souare Mall	6 - 3in1 Housing	60	28	
23 6-000019 On Field Fatorices IEM 6-3 in1 Housing 58 24 987 6-000181 On Field P5. Tamelness Changkat Zone 3.RN 6-3 in1 Housing 57 28 55 6-000051 On Field School Kent Ridge Camous 6-3 in1 Housing 57 28 29 6-000051 On Field School Kent Ridge Camous 6-3 in1 Housing 56 28 1107 6-000041 On Field School Kent Ridge Camous 6-3 in1 Housing 55 22 1104 6-000059 On Field Counts: The Heeren 6-3 in1 Housing 55 26 349 6-000070 On Field School Schrig Centre Centre Para 6-3 in1 Housing 54 27 1053 6-000070 On Field School Schrig Centre Centre Para 6-3 in1 Housing 54 27	- III	1083	6-000377	On Field	Commerical NUH	6 - 3in1 Housing	60	26	
987 6-000181 Din Field 95. Tampines Changkait Zone B.Bis 6 - 3in1 Housing 57 28 55 6-000051 Din Field School. Stent Fildge Campus 6 - 3in1 Housing 57 28 29 6-000025 Din Field School. Stent Fildge Campus 6 - 3in1 Housing 56 28 1107 6-0000401 Din Field Courts. The Heersn 6 - 3in1 Housing 55 22 1104 6-000070 Din Field Counts. The Heersn 6 - 3in1 Housing 55 26 249 6-000070 Din Field School. Stent Fildge Centra Lessel 6 - 3in1 Housing 54 27 1053 6-000070 Din Field School. Stent Zinge Centra Lessel 6 - 3in1 Housing 54 27		23	6-000019	On Field	Exerconice. JEM	6 - 3in1 Housing	58	24	
55 6-000051 Din Field School. Kent Bidge Gampus 6 - 3in1 Housing 57 28 29 6-000025 On Field PA. Hillstein CC 6 - 3in1 Housing 56 28 1107 6-000401 On Field Courts. The Heersn 6 - 3in1 Housing 55 22 1104 6-000398 On Field Commercial. Alexandra Hospital 6 - 3in1 Housing 55 26 249 6-000070 On Field Commercial. Alexandra Hospital 6 - 3in1 Housing 54 27 1053 6-000347 On Field PA. Woodlands Zone 2 RN 6 - 3in1 Housing 54 27		987	6-000181	On Field	P.S. Tampines Changkat Zone B BN	6 - 3in1 Housing	57	28	
29 6-000025 On Field Pb. Hilliew. CC 6 - 3in1 Housing 56 28 1107 6-000401 On Field Courts. The Heeren 6 - 3in1 Housing 55 22 1104 6-000398 On Field Commercial. Alexandra Hospital 6 - 3in1 Housing 55 26 349 6-000070 On Field Shooping Centre. Central Plaza 6 - 3in1 Housing 54 27 1053 6-000347 On Field Ph. Woodlands Zone 2 RN 6 - 3in1 Housing 53 28		55	6-000051	On Field	School Kent Bidge Camous	6 - 3in1 Housing	57	28	
1107 6-000401 On Field Courts. The Hearsn 6 - 3in1 Housing 55 22 1104 6-000398 On Field Commercial, Alexandra Hospital 6 - 3in1 Housing 55 26 349 6-000070 On Field Shopping, Central Plaza 6 - 3in1 Housing 54 27 1053 6-000347 On Field PA, Woodlands Zone 2 RN 6 - 3in1 Housing 53 28		29	6-000025	On Field	PA.Hillview.CC	6 - 3in1 Housing	56	28	
1104 6-000398 On Field Commercial_Alexandra Hospital 6 - 3in1 Housing 55 26 249 6-000070 On Field Shooping Centres Central Plaza 6 - 3in1 Housing 54 27 1053 6-000347 On Field PA, Woodlandis Zone 2 RN 6 - 3in1 Housing 53 28		1107	6-000401	On Field	Courts. The Heeren	6 - 3in1 Housing	55	22	
349 6-000070 De Field Shapping Central Plaza 6 - 3in1 Housing 54 27 1053 6-000347 De Field PA, Woodlands Zone 2 RN 6 - 3in1 Housine 53 28		1104	6-000398	On Field	Commerical Alexandra Hospital	6 - 3in1 Housing	55	26	
1053 6-000347 On Field PA, Woodlands Zone 2 RN 6 - 3in1 Housine 53 28		349	6-000070	On Field	Shopping Centre, Central Plaza	6 - 3in1 Housing	54	27	
		1053	6-000347	On Field	PA. Woodlands Zone 2 RN	6 - 3in1 Housing	53	28	
1061 6-000355 On Field Challenger, Sun Plaza 6-3in1 Housing 53 24		1061	6-000355	On Field	Chailenger. Sun Plaza	6 - 3in1 Housing	53	24	

- Each 3in1 bin is equipped with a state of the art fill/temperature sensor
- Sensor allows real-time monitoring of fill level
- Temperature sensor will alert if fire is detected



Li-ion battery transportation

Best Practice

- All vehicles are fitted with Emergency kits (ie. Class A fire extinguisher & First Aid kit).
- Transportation via covered trucks at all times.
- Point to point route during transportation (ie. no stop-over at any other site) at all times.
- When transporting high volume of Li-ion batteries, additional fire extinguishers to be issued to the vehicle with one attendant accompanying the driver to act as "watch-keeper" throughout the route.







Li-ion battery storage in the warehouse

- Dedicated location (ie High-risk) away from emergency exits / pathway / stairways for storage of Li-ion batteries.
- Placement of additional Class A type fire extinguishers (ie. dry powder) at specified locations around this High-risk location.
- All batteries are placed in bags stored in metal containers with the top layer covered with sand bags and fire-balls in placed.
- Any batteries that are stored on pallets will be placed together and Unique Fire extinguishers (for Lithium battery fire only) are placed around the location.









Li-ion battery storage in the warehouse

Best Practice

- Installation of thermal IR camera (ie. 24x7 CCTV) at High-risk location.
- SMS alerts to mobile phone when higher temperature is recorded
- Submission of floor plan with these locations marked to site-SCDF office.





IR cameras accessible via Mobile Phone

SMS Alert on increase of temperature









ALBAR

Treasure raw materials.

3105 1608 contact@alba-ewaste.sg

www.alba-ewaste.sg

@alba_Singapore