ANNEXURE A1 20/21/22E BATTERY USER REQUIREMENT SPECIFICATIONS CLAUSE BY CLAUSE RESPONSE

Do not simply indicate that the product Comply or state a value, also substantiate the Compliance for the product with proof from the manufacture's brochure or in writing from the manufacturer.

Electric locomotive replacement battery requirements. Values of proposed product to be indicated in the "resp" column

Item no	Ampere-Hour (Ah)		Voltage per cell (V)		Battery Cell dimensions LxWxH (mm)		VRLA (yes/no)	Weight (kg)	
	spec	resp	spec	resp	spec	resp	resp	spec	resp
BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	170(C5)		12		507x178x345			67	
BATTERY;20/21/22E 6V	170(C5)		6		242x170x274			32	

The batteries to be offered shall comply fully with the following standards. If non-compliant to indicated standard, indicate alternative equivalent standard used.

SANS 60077-1:1999 (Railway applications – Electrical equipment for rolling stock. General service conditions and general rules.).

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V	Alternative Standard
Comply(y/n)			

SANS 60254-1:2005 (Lead-acid traction batteries - General requirements and methods of test.).

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V	Alternative Standard
Comply(y/n)			

SANS 61373:2010 (Railway applications - Rolling stock equipment – Shock and vibration tests.). Category 1b must be used for the vibration test based on SANS 61373.

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V	Alternative Standard
Comply(y/n)			

BS EN 45545-2:2013. (Railway applications – Fire protection on railway vehicles. Requirements for fire behaviour of materials and components.)

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V	Alternative Standard
Comply(y/n)			

BS EN 45545-5:2013. (Railway applications – Fire protection on railway vehicles.)

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V	Alternative Standard
Comply(y/n)			

BS EN 50547:2013. (Railway applications – Batteries for auxiliary power supply systems.)

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V	Alternative Standard
Comply(y/n)			

BS EN 60695-11-10:2015. (Fire hazard testing. 50 W flame test methods.)

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V	Alternative Standard
Comply(y/n)			

BS EN 60707:1999. (Flammability of solid non-metallic materials when exposed to flame sources.)

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V	Alternative Standard
Comply(y/n)			

ISO 9001: Quality

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V	Alternative Standard
Comply(y/n)			

ISO14001: Environmental management

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V	Alternative Standard
Comply(y/n)			

The type of batteries shall be maintenance free, sealed; valve regulated lead-acid (VRLA) batteries

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V
Comply(y/n)		

The nominal discharge capacity of the batteries must be stated @ 5 hour to 1.6V per cell for the 6V battery

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V
Amp value		

Service life of batteries must be at least 7 years at 25 ºC and cycle life must be 1000 cycles at 80% DOD (depth of discharge)

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V
Comply(y/n)		

Recommended storage and operating temperatures should range between ~5 ºC ~ 50 ºC for storage; ~5 ºC ~ 45 ºC for discharge and 0 ºC ~ 40 ºC for charging.

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V
Comply(y/n)		

Operational humidity should be up to 90% non-condensing.

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V
Comply(y/n)		

The date of manufacture should be not more than three months before delivery and preferably has to be hard time stamp on the battery.

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V
Comply(y/n)		

The battery shall be supplied complete with connectors between cells and at the main positive and negative terminals. The connectors shall be of robust construction of adequate size to minimize voltage drop and be made of flexible insulated copper conductor cable. The inter-connectors and terminals shall be fully insulated.

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V
Comply(y/n)	

The batteries must fit the stainless steel battery container; the outer dimensions of the battery container are 507x178x345

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V
Comply(y/n)		

The shipped cells shall be fully charged, ready to be installed at site and should give a capacity of not less than 90% of rated value when tested at site at any time up to 6 months of its receipt.

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V
Comply(y/n)		

Item BATTERY RECHR;MONOBLOCK 20/21/22E,12 V

Type, composition and volume of electrolyte should be stated
Make, material, number and minimum plate thickness shall be stated
Internal pressure which the container can stand should be stated
Maximum discharge current and recharge voltage should be stated

The separator shall be low resistance micro porous material
Comply(y/n)
Terminals shall be fastened with non-capsulated bolts
Comply(y/n)
Test results must be supplied to confirm capacity at @ 5 hour to 1.6V per cell for the 6V battery
Test results attached to tender (y/n)

Item BATTERY;20/21/22E 6V

Type, composition and volume of electrolyte should be stated
Make, material, number and minimum plate thickness shall be stated
Internal pressure which the container can stand should be stated
Maximum discharge current and recharge voltage should be stated
The separator shall be low resistance micro porous material
Comply(y/n)
Terminals shall be fastened with non-capsulated bolts
Comply(y/n)
Test results must be supplied to confirm capacity at @ 5 hour to 1.6V per cell for the 6V battery
Test results attached to tender (y/n)

Polyethylene battery boxes: Polyethylene compound requirements

Self-extinguishing

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V
Comply(y/n)		

Adhere to UL-94HB, horizontal test based on specified requirements in BS EN 60695-10-11:2015

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V	Alternative Standard
Comply(y/n)			

Adhere to UL-94V-1, vertical test based on specified requirements in BS EN 60695-10-11:2015

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V	Alternative Standard
Comply(y/n)			

Low, non-toxic smoke emissions

	BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	BATTERY;20/21/22E 6V

Comply(y/n)		

The tenderer shall give the supplier's / manufacturer's technical data with the tender including the following. To be supplied as a data pack for each battery type (per item no).

- Model number
- Number of poles per cell
- Charge, discharge characteristics, and values for boost, float equalizing modes.
- Maximum internal resistance of the battery
- The cycle life with DOD (depth of discharge) characteristics
- Temperature effects on performance and capacity
- Self-discharge characteristics
- Storage conditions and relationship curves between remaining capacity and storage with different capacity at different temperature.
- Relationship between OCV and DOD
- Shock and vibration test certificate with pass criteria as defined in SANS 60095-1 and SANS61373.

The supplier shall provide a list of all material included with each battery set for example, bolts, washers, inter cell bolt-on flexible connector, inter battery bolt-on flexible connector, battery to cable connector etc.

BATTERY RECHR;MONOBLOCK 20/21/22E,12 V	
BATTERY;20/21/22E 6V	

Confirmation from Supplier and Manufacturer

Supplier Name:

Signature from Supplier's Official Technical Representative that above info is correct:

_____

Date:

Manufacturer Name:

Signature from Manufacturer's Official Technical Representative that above info is correct:

_____

Date: