

SLPB (Superior Lithium Polymer Battery) Technical Specification

Model # (Product Number)	SLPB72216216 (KB031KG037A-01)	
------------------------------------	---	--

Kokam Co. Ltd,
Research & Development Department

Table of Contents

1. History of document	3
2. Technical specification	
2.1 General information	4
2.2 Drawing	5
2.3 Electrical Performance	6
2.4 Environmental Performance	9
2.5 Life Performance	10
3. Shipping Condition	11
4. Handling Precaution	12

*** Preparation & Approvals**

Description	Name	Remarks
Prepared by	KH, Kim	
Checked by		
Approved by	ST, Ko	

1. History of Document

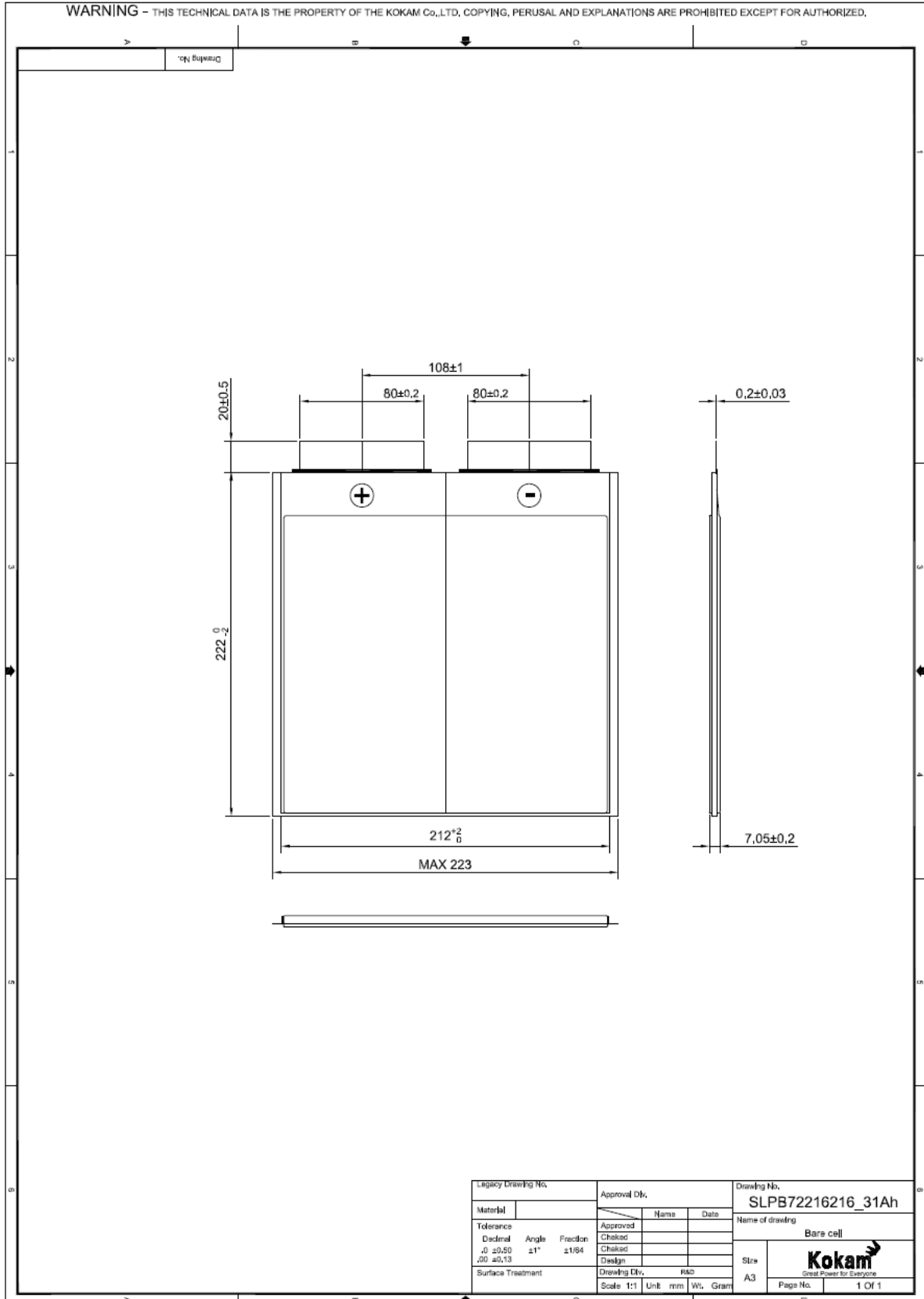
Revision No.	Date of revision	Purpose/contents of revision	Remarks
A0	Feb. 10, 2009	Issued	
A1	Apr. 05, 2010	• Voltage value change	4 page
		• Operation temp. range change	4 page & 9page
		• Cycle life testing condition change: Charge	6 page & 10 page
		• Discharge temp. range change	6 page
		• Temperature characteristics graph change	7 page
		• Warning 7: Store conditions change	12 page

2. Technical Specification

2.1 General Information

No.	ITEM	VALUE	REMARK
1	Rated Capacity	Typ. 31.0Ah Min. 30.0Ah	Charge@0.2C(6.2A) Discharge@0.5C(15.5A)
2	Nominal Voltage	3.7V	
	Lower limit voltage	2.7V	
	Upper limit voltage	4.2 ±0.03V	
3	Max. Conti. Charge Current	62A	CC-CV charging is required End Condition: 0.05C(1.55A) or 5Hr Temperature: 23 ± 3 °C
4	Max. Conti. Discharge Current	155A	
	Peak Discharge Current	248A	Less than 10sec
5	Operation Temperature Range	Charge: 0 ~ 45°C	@60 ± 25% R.H.
		Discharge : -20 ~ 60°C	
6	Storage Temperature Range	less than 1 year -20 ~ 25 °C	@60 ± 25% R.H. SOC 50 ± 5%
		less than 3 months 25 ~ 40 °C	
		less than 1 week 40 ~ 60 °C	
7	Weight	Max. 705.0g	
8	Cell Dimension	Length : Max.222.0mm	Except for tab length
		Width : Max.214.0mm	
		Thickness : Max.7.25mm	Initial full charge

2.2 Drawing

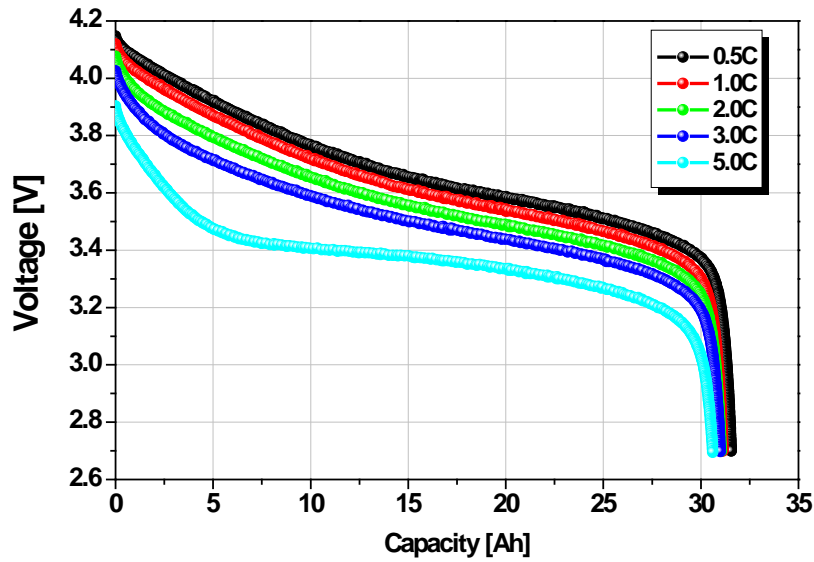


2.3 Electrical Performance

.No	ITEM	CRITERIA			TESTING CONDITIONS		
1	Outside Appearance	No abnormal strain, Deformation nor damage			Visual check		
2	External Dimension	According to the attached drawing			Use caliper (0.05mm a division) specified in ISO 3599		
3	Discharge Time	More than the time Mentioned hereunder			Measure capacity by holding at various temperatures for 1Hr after standard charging.		
	Discharge Rate	0.5C	1.0C	2.0C	3.0C	5.0C	
	Capacity(%)	100%	> 95%	> 90%	> 85%	> 80%	
	Discharge Temperature	-20 °C	-10 °C	0 °C	25 °C	40 °C	60 °C
	Capacity(%)	> 60%	> 70%	> 85%	100%	> 97%	> 97%
4	Charge Current	Less than 5.0 hrs			0.5C		
		Less than 2.0 hrs			1.0C		
5	Initial Internal Impedance	Less than 0.95mΩ			Measure by alternate current (1kHz) within 6hr after charge. (23±3°C)		
6	Cycle Life	Above 24.8Ah			Carry out 1400cycles charging/discharging in the below condition. ■ Charge : CC/CV, 1.0C(31A), 4.2V, 0.05C(1.55A)(5Hr)-END ■ Discharge : 1.0C(31A) to 3.0V ■ Rest Time between charge/discharge : 10min. ■ Temperature : 23±3°C		
7	Storage Performance	Above 27.9Ah			After full charge at 60±3°C, then leave 1 week. After storage, measure discharge capacity at 23±3°C		
8	Leakage-Proof	No leakage [visual inspection]			After full charge, stand at 60±3°C, 60±10%RH for 1month.		

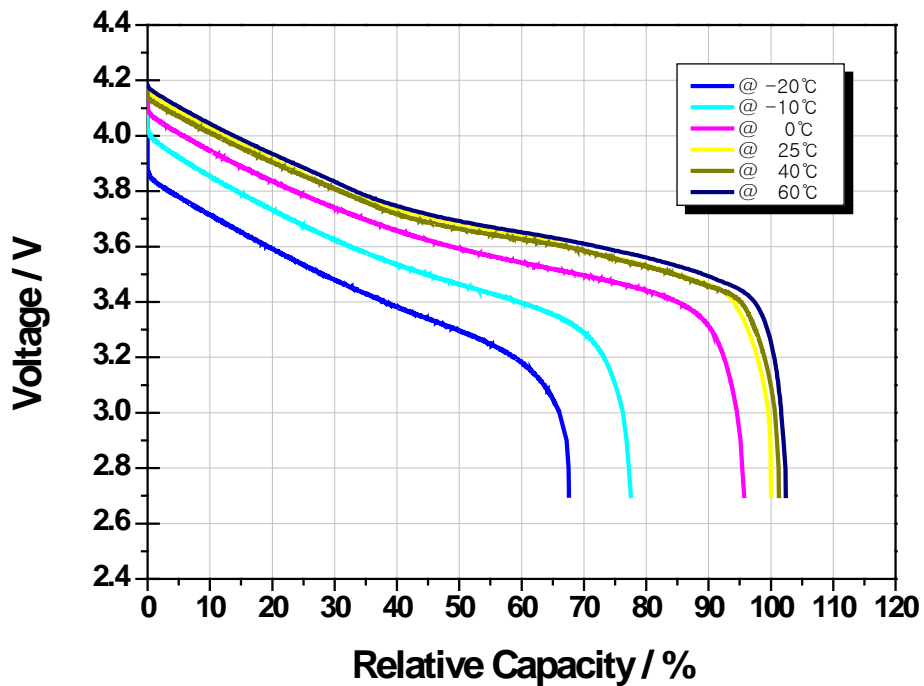
◆ Discharge profiles at RT

- ❖ Charge : CC-CV, 1.0C, 4.2V, 0.05C cut-off @23°C±3°C
- ❖ Discharge : CC, 0.5 ~ 5.0C, 2.7V cut-off @23°C±3°C



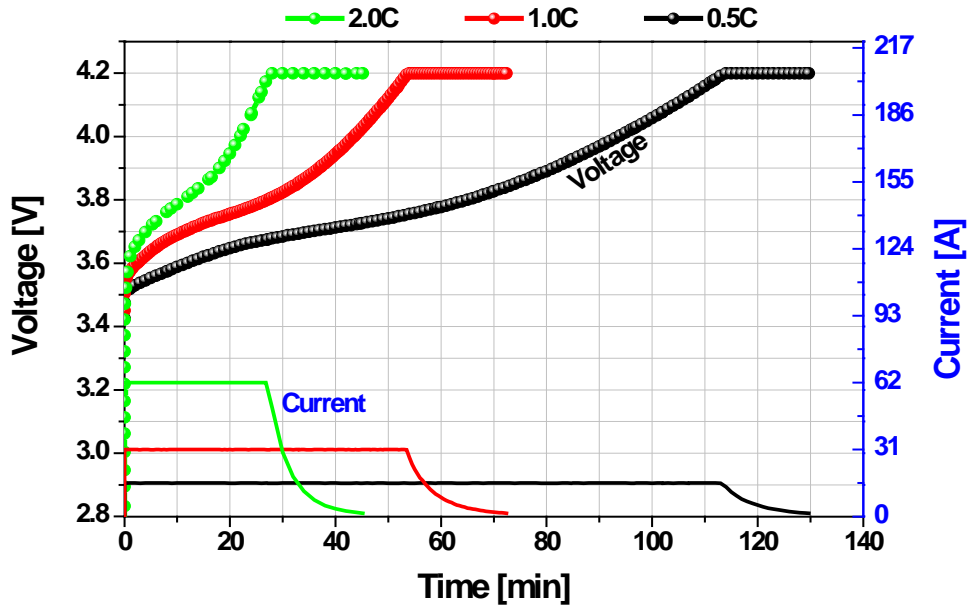
◆ Temperature characteristics

- ❖ Charge : CC-CV, 0.5C, 4.2V, 0.05C cut-off @23°C±3°C
- ❖ Discharge : CC, 0.5C, 2.7V cut-off @ each temperature
- ❖ Soaking time : 2hr



◆ Charge profiles at RT

❖ Charge : CC-CV, 0.5C ~ 2.0C, 4.2V, 0.05C cut off @23°C ±3°C



2.4 Environmental Performance

- Operating condition

Charging : 0~45°C

Discharging : -20~60°C

- Storage condition

SOC 40~60% at -20~60°C

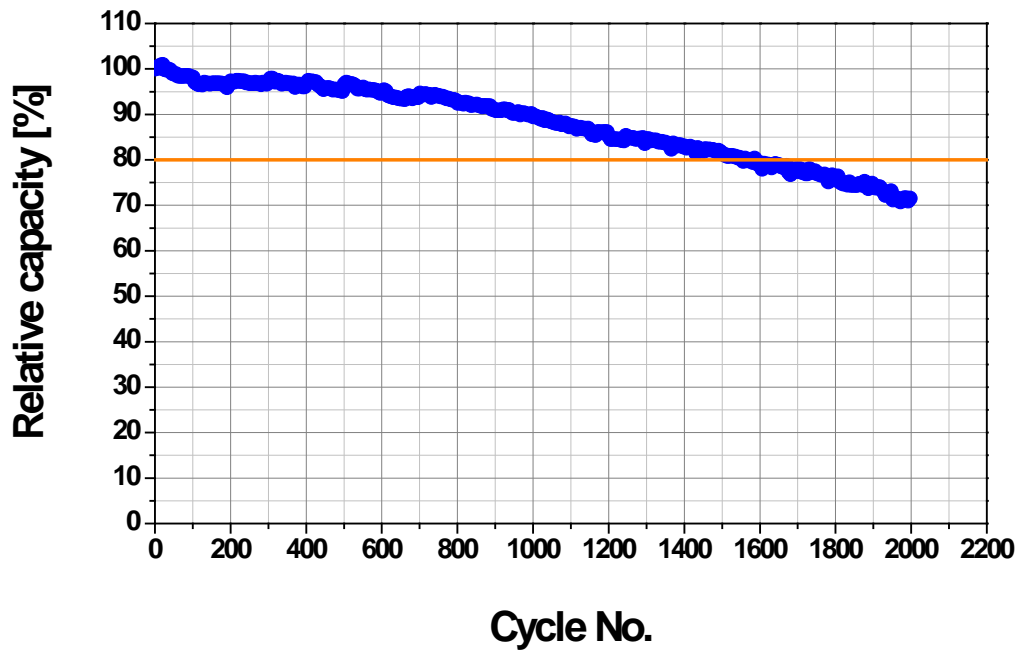
- Self discharging rate

< 1% for Month at Room temperature

2.5 Life Performance

Cycle characteristics at RT

- ❖ Charge : CC-CV, 1.0C, 4.2V, 0.05C cut-off @23°C±3°C
- ❖ Discharge : CC, 1C, 3.0V cut-off @23°C±3°C



3. Shipping Condition

3.1 Battery SOC at shipping

The battery will be charged to approximate SOC 50%

4. Handling Precaution



Danger

- 1 Do not disassemble or alter the battery. The battery contains a safety mechanism and a protecting device in order to avoid any danger. If these are damaged, heat generation, smoke emission or ignition may be caused.
- 2 Do not let the battery terminals (+ and -) contact a wire or any metal (like a metal necklace or a hair pin) with which it carried or stored together. In such a case, the battery is shorted and causes an excessive current, which may result in heat generation, smoke emission or ignition.
- 3 Do not put the battery into a fire or heat it. In such a case, the insulator in the battery may be damaged, all of which may cause heat generation, smoke emission or ignition.
- 4 Do not use or leave the battery near a heat source such as a fire or heater (80°C or higher). Such a high temperature may cause damage of the protecting device in the battery, which may result in heat generation, smoke emission or ignition.
- 5 Do not dip or wet the battery in water, seawater, or other liquid. If the protecting device assembled in the battery is damaged, the battery may be charged with an abnormal current and voltage, which may result in the cause of heat generation, smoke emission or ignition of the battery.
- 6 Do not apply heavy impact to the battery, or throw or drop it. Strong impact may damage the protecting device, which may result in heat generation, smoke emission or ignition of the battery.
- 7 Do not drive a nail in, hit with a hammer, or stamp on the battery. In such a case, the battery may be deformed and shorted, and the protecting device may be damaged, which may cause heat generation, smoke emission or ignition of the battery.
- 8 The battery has a predetermined polarity. If the battery will not connect well to the charger or equipment, do not try to connect the battery forcefully. Check the polarity first. In the case the battery is connected in reverse, it is charged reversely and may cause leakage, heat generation, smoke emission or ignition due to an abnormal chemical reaction.
- 9 Do not connect the battery reversed in positive (+) and negative (-) terminals in the charger or equipment. In the case the battery is connected in reverse, it is charged reversely during charge, and causes an excessive current during discharge, and may cause heat generation, smoke emission or ignition due to an abnormal chemical reaction.
- 10 The battery to be charged must be placed on a non-flammable, heat resistant and non-conductive surface. Keep inflammable and volatile materials well away from the charging area. Batteries must not be left on charge unsupervised.
- 11 Do not charge battery without proved safety circuit. If unexpected errors occur in charger, it might cause overcharging and it could be resulted in safety accident. Safety Guard made by Kokam or better quality circuit must be used for charging.
- 12 Do not use any unqualified charger or not specified by Kokam, also, follow the charge conditions specified by Kokam. If the battery is charged under other conditions (a high temperature, a high voltage / current, or an altered charger) not specified by Kokam, the battery may cause heat generation, smoke emission or ignition with abnormal chemical reactions.
- 13 Do not connect the battery directly to an electric outlet or cigarette heater socket in a car. Applying a high voltage may generate an excessive current, and get an electric shock. Possibly leading to leak electrolyte, heat generation, smoke emission or ignition.
- 14 Do not use the battery for a purpose other than those specified. Otherwise, its guaranteed performance will be lost and/or its service life will be shortened. Depending on the equipment in which the battery is used, excessively high current can flow through battery, possibly damaging it and leading to leakage, heat generation smoke emission or ignition,

- 15 If the battery leaks, and the electrolyte gets into the eyes, do not rub them. Instead, rinse the eyes with clean running water and immediately seek medical attention. Otherwise, eye injury may result.
16. Be careful that conductivity material should not touch on the surface of battery.



Warning

- 1 Do not use the battery together with a dry battery or other primary battery or other battery of a different capacity, types and / or brand. In such a case, over-discharge during use, or over-charge during charge may occur and abnormal chemical reactions may cause heat generation, smoke emission or ignition of the battery.
- 2 Discontinue charging after specified charging time even if the charge is not complete. Otherwise, the battery might cause heat generation, smoke emission or ignition.
- 3 Do not put the battery in a microwave oven or a pressure cooker. Sudden heat may damage the seal of the battery and may cause heat generation, smoke emission or ignition of the battery.
- 4 If you notice any malodor, heating, discoloration, deformation, or any other change from what you are used to while using, charging, storing the battery, take it out of equipment or charger, and avoid using it. Using it in such state may result in heat generation, smoke emission or ignition.
- 5 If the battery leaks or emits a malodor, take it away from any fire immediately. The electrolyte may catch fire, which may cause heat generation, smoke emission or ignition.
- 6 Do not use the battery in the place where the static electricity (more than the limit of the manufacturer's guarantee) occur.
- 7 Do not use the battery in other than the following conditions
 Discharge : -20 deg. C — + 60 deg. C
 Store (less than 1 year) : -20 deg. C — +25 deg. C (on the charge of 50 %)
 Store (less than 3 months) : +25 deg. C — +40 deg. C (on the charge of 50 %)
 Store (less than 1 week) : +40 deg. C — +60 deg. C (on the charge of 50 %)



Caution

- 1 Do not use or leave the battery in a place exposed to strong direct sunlight, or in a car under the blazing sun, or high temperature sources. Such a high temperature may cause performance will be lost and/or its service life will be shortened.
- 2 If you find the battery rusty, malodor, heating, or any other defective before using the battery for the first time after purchase, do not use it. Take it back to the dealer instead.
- 3 Store the battery in a location where children cannot reach it. Also, make sure that a child does not take out the battery from the battery charger or equipment.
- 4 If the battery leaks and its electrolyte contact with skin or clothes, wash it well with tap water or other clean water right away. Otherwise, skin inflammation can occur.
- 5 Read the instructions of your equipment regarding the battery installation and removal from the equipment so as not to mishandle and waste the battery.
- 6 The battery was charged a little before shipment for temporary use by an end user. In case your equipment does not operate with the battery or in the case of a long use, charge the battery with a specified charger once
- 7 In the case the battery terminals are dirty, clean the terminals with a dry cloth before use, otherwise, the contact with equipment might cause insufficiency, and power failure or charge failure
- 8 Carefully read the instructions for the specified charger to learn how to charge the battery.
- 9 Do not charge the battery over the specified time described in the instruction