


To.MASTER INSTRUMENTS PTY LTD.

Specification	
Alkaline Battery	
Ordering code	LR20XW/2SKXA
Designation	LR20

Approved by
Division/Department
Name
Signature/date

Date : Feb.14,2023

Energy Device Business Division
Panasonic Energy Co., Ltd.

Approved	Checked	Drafted
 S.Kato Eng. Dep.	 T.Okada Eng. Sec.	 Y.Hoshina Eng. Sec.

Revision history

No .	Date	LR20XW/2SKXA
1	2022/2/1	1) Change of Company name Panasonic Corporation Panasonic Energy Co., Ltd. (From April 1, 2022) 2) Statement changes on label · Change in line with the revision of National Standard (GB) of P. R. China . GB Standard Number Alteration (Existing) GB/T8897.2-2013 (New) GB/T8897.2-2021 · Sales company name & address, COD mark, Japanese warning text [警告文]皮膚 皮ふ Outer Carton; Sales company name, Manufacturing company name & address, Care mark 3) Revision of product specifications · Format change · Consistency with the latest JIS standards · Addition of items - Quality warranty and disclaimer - Operation and change of this specification · Addition of precautions & modify wording
2	2022/4/1	Change of company name in specifications
3	2022/10/7	Change of battery outer label (Printing method change of expiry date code) Scheduled to be changed from April 2023 production

1 Application scope
This specification applies to the LR20XW(hereinafter reference to as “this product”) which is manufactured by Panasonic Energy Co., Ltd..

2 General

- 2.1** Relevant major official standards
JIS C 8510, JIS C 8514, JIS C 8515, IEC 60086-1, IEC 60086-2, IEC 60086-5
- 2.2** Designation : **LR20**
- 2.3** Nominal Voltage : **1.5 V**
- 2.4** Product mass : **133 g**
- 2.5** Expiration date is indicated to the drawing of artistic designs.

3 Performance

- 3.1** OCV shall satisfy Table 1 after the test mentioned in 7 (Testing).
- 3.2** Minimum Average Duration (MAD) : The MAD shall meet the value mentioned in Table 1 or more, after the test of 7 (Testing).
- 3.3** Resistance to leakage shall satisfy Table 1 after the test of 7 (Testing).

Table 1 : Performance

		Testing condition				Panasonic Energy Co., Ltd. SPEC	
		Load	Discharging time per day	End point (V)	Unit	Initial	20°C After 12 months
OCV ^{a)}		–	–	–	V	Max. 1.68	Max. 1.68
						Min. (1.54)	Min. (1.53)
Minimum Average Duration (MAD)		2.2Ω	^{b)}	0.9	min	1050	945
		600mA	2hour	0.9	h	13	12.3
		2.2Ω	1hour	0.8	h	21	18.5
Resistance to Leakage	Over discharge	Cf. Table 2				There shall be neither evidence of electrolyte leakage on the surface of any battery nor deformation beyond the specified dimension.	
	Under High temperature	Cf. Table 2				There shall be neither evidence of electrolyte leakage on the surface of any battery nor deformation beyond the specified dimension.	

Note a) “Max.” and “Min.” in column of OCV mean maximum and minimum values. The value with parenthesis is informative.

b) Repeat the cycle of 4 minutes on, 11 minutes off, for 8 hours continuously.

4 Dimensions: As per attached Figure 1.

5 Terminals: As per attached Figure 1. (+) Cap, (–) Base

There shall be no rust or deformation, which will cause hindrance on use.

6 Appearance: There shall be no stain, scratch and deformation which will cause hindrance on use.

The marking on surface shall be clear.

7 Testing

7.1 Storage and testing condition : If not specified, the temperature is 20 ± 2 °C and the relative humidity shall be (55 ± 20) %. However, during 3 months that it is short period only, it may be 20 ± 5 °C.

7.2 Testing method : Refer to Table 2

Table 2 : Testing method

Open circuit voltage	After more than 8 hours storage under the condition specified in 7.1, measure with a voltmeter mentioned below at the same condition. The accuracy of the measuring equipment shall be $\leq 0.25\%$ and the precision shall be $\leq 50\%$ of the value of the last significant digit. The internal resistance of the measuring instrument shall be $\geq 1M\Omega$.
Service life	Battery shall be discharged as specified condition until the voltage on load drops for the first time below the specified end point. (service life under the intermittent discharge should be accumulated the time on load) a) Commencement: After more than 8 hours storage under the condition specified in 7.1. b) Discharging method : Based on Table 1 c) Calculation of average service life: Test 8 batteries and calculate the average.
Resistance to leakage at over discharge	After usual discharging test, the discharge is continued until voltage of battery drops to 0.6 V for the first time.
Resistance to leakage at high temperature	The test battery should be stored for 30 days under the temperature at 45 ± 2 °C and relative humidity below 70 %(RH).
Dimensions	Dimensions shall be measured by the vernier caliper specified in JIS B 7507 having below 200 mm of measuring capability and minimum division 0.05 mm.
Terminal	Visual Observation
Appearance	Visual Observation

8 Marking Specified as the drawing of designs.

9 Manufacturer
Panasonic Energy Co., Ltd.

Unit: mm

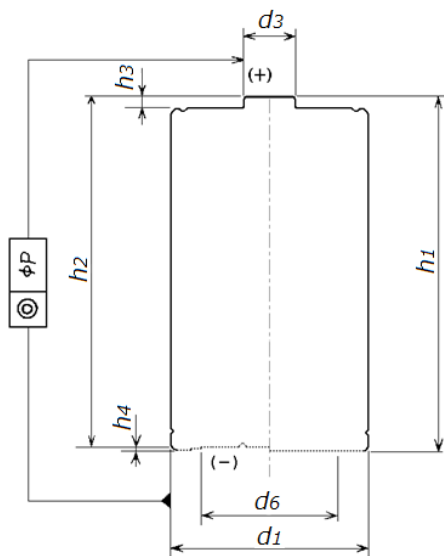


Figure1 LR20

	JIS C 8515:2017	
	Max.	Min.
$h1$	61.5	(59.5)
$h2$	—	59.5
$h3$	—	1.5
$h4$	1.0	—
$d1$	34.2	32.3
$d3$	9.5	(7.8)
$d6$	—	18.0
ϕP	1.0	—
Pip	0.4	—

Note 1 Numerical value with parentheses: informative

Note 2 The symbols of dimensions are as following.

$h1$: maximum overall height of the battery

$h2$: minimum distance between the flats of positive and negative contact

$h3$: minimum projection of the flat positive contact

$h4$: maximum recess of the negative flat contact surface

$d1$: maximum and minimum diameter of the battery

$d3$: maximum diameter of the positive contact within the specified projection height

$d6$: minimum outer diameter of the negative flat contact surface

ϕP : concentricity of the positive contact

Pip : height of pip (This model doesn't have pip.)

Note 3 The cylindrical surface is insulated from the contacts.

Note 4 The negative contact " $d6$ " is not necessarily flat over the whole area.

10 Quality warranty and disclaimer

10-1 Warranty coverage

Our company warrants that the product shall conform to this specifications for a period of 12 months from the date of delivery (“Warranty Period”). During the Warranty Period, if the customer finds a non-conformity of the product, our company will independently analyze the cause of such non-conformity in the product. If our analysis confirms the non-conformity is solely attributable to the negligence of us, our company agrees to supply conforming products as a replacement at its sole expense.

10-2 Disclaimer

- 1.** Since the product is the battery designed and manufactured not for special applications in which: (1) quality, reliability and safety are required, or (2) the failure or malfunction of the product may directly jeopardize life or cause threat of personal injury, such as for medical equipment, automotive equipment, aircraft and aerospace equipment, aircraft electronics equipment, explosion-proof equipment, railway-related equipment, military-related equipment, but for general consumer products, our company cannot accept responsibility for damages caused to the customer or third parties due to the use of the product for the said special applications.
- 2.** Our company does not assume any responsibility for breakdown and characteristics change due to external factors at the time of product handling or at customer's process, resulting from the fact that the range of use conditions and environment as well as precautions in the catalog, product specifications and “General Instructions in Use of Dry Battery” herein are not observed.
- 3.** When designing your equipment, comply with the range of operating conditions guaranteed in these specifications. Otherwise, our company will not be liable for any breakdown or defect which may arise later in your equipment.
- 4.** Our company cannot accept responsibility for defects resulting from your conversion, modification, or additional processing of the product.
- 5.** Our company cannot take responsibility for a problem if it is due to a phenomenon that cannot possibly or is difficult to be prevented by the technology made available at the time of the purchase or contract.
- 6.** It is your responsibility to confirm matching and life of our product and your products after our product is integrated into your devices. Quality assurance is also your responsibility. We cannot accept responsibility for damages or defects caused due to any combination, incorporation or compatibility of our company's product into or with your or other parties' products, parts, or materials etc.
- 7.** When reselling products described in these specifications to other companies and receiving any claim or request from the resale destination, please understand that customers will bear the burden.
- 8.** Our company cannot accept responsibility for damages caused by natural disaster, war, civil disorders, riots, labor dispute actions, fire or other force majeure event, or order, disposition or directive due to the formulation, amendment or abolishment of laws and ordinances in and out of the country, or other reasons beyond our reasonable control.

11 General Instructions in Use of Dry Battery

1. Discharge

- Please use batteries at a temperature of 5 ~ 45°C.
- Less than 5°C, the discharge capacity can drop extremely.
- More than 45°C, performance deterioration and leak of contents may occur.

2. Storage

- Please store in a dry, clean, cool and ventilated place, and also avoid touching water-drops and snow. Please store batteries at a temperature of 10 ~ 25°C and should never exceed +30°C. Extremes of humidity (over 95% RH and below 40% RH) should be avoided.
- Storage at a high temperature promotes self-discharge of battery and may decrease the performance and the service life of it and also may cause leak.
- Storage at a high humidity may cause rust of the terminals or the metal parts of a battery. Storage in a low temperature place can cause rust of the terminals or the metal parts, since dew condensation by the humidity at there may occur.
- Please store in a place without corrosive gases (hydrogen sulfide, ammonia etc.).
- Please do not store batteries wrapped in aluminum foil or together with metallic articles.
- When storing such as 9V type or other layer-built batteries, please put insulating tapes on both terminals not to short-circuit.
- When storing the batteries for emergency use, please check “Expiry month and year of recommended use” of them regularly. Please replace the battery that is out of “Expiry month and year of recommended use ” with a new one immediately.

3. Cleaning of the terminals

- Before putting a battery in equipment, please wipe the each terminal of them cleanly. When the terminals of a battery or equipment become tainted, equipment may work insufficiently due to bad electrical contact.

4. Expiry month and year of recommended use

- The “Expiry month and year of recommended use” is the time limit by which the battery performance specified in JIS (Japanese Industrial Standard) is achieved when the battery is stored without being loaded in the equipment in the unused state (storage temperature 20 ± 2 °C). In other words "Expiry month and year of recommended use" does not mean that the overdue battery is not usable, but the meaning is to suggest using a battery within this period as much as possible.
- “Expiry month and year of recommended use” setting by type or size is shown on a battery.
- Example of “Expiry month and year of recommended use” is as follows.
Month in two digits and year in four digits (or last two digits of it) is shown on the bottom or side of a battery.
Ex. 1: 01-2026 means that the expiry month and year of recommended use is January 2026.
Ex. 2: 01-26 means that the expiry month and year of recommended use is January 2026.

12 Operation and change of this specification (revision or abolition)

In the event of any failure or accident regarding matters not described in this specification, the both companies will discuss and deal with the matter in good faith.

Questions, revisions, and abolition concerning these specifications shall be conducted based on mutual consultation and agreement.

If this specification is not approved or returned 6 months after the date of issue or the first delivery date of the product, whichever is earlier, it will be understood that your company has approved and received the specification.

符号/SYMBOL	年月日/DATE	訂正などの履歴 /RECORD OR REVISION	記印/SIGNED	検印/CHECKED
制定	2022. 09. 13	新意匠発行/New design.	M.Tano	S.Makata



使用推奨期限表示位置
 /The position of Expiry date code (MM-YYYY)
 ←位置指示のため表示しない。
 /This line is unnecessary. (Not printed)

本図面は、現物とは若干、色調が異なります。 / ACTUAL COLOR IS DIFFERENT FROM THAT IN THIS SHEET.

(単位/Unit : mm)

使用推奨期限の付与方法/Control of Expiry date code 例/Example	
生産年月/Production date	表示内容/Indication on body
2022年9月/September, 2022	09-2027
2022年10月/October, 2022	10-2027
2022年11月/November, 2022	11-2027
2022年12月/December, 2022	12-2027
ご注意/Attention 切替単位：年12回/Frequency: Twelve times per a year	

符号表示位置/ THE POSITION OF DATE CODE		寸法図面 参照	AL	LR20XW	PET				
絶縁リング 又は 端子板/ DIVORCE RING OR TERMINAL BASE		—	記号/SYMBOL	品番 / MODEL NUMBER	材質 / MATERIAL				
符号/ CODE	製造符号 / PRODUCTION CODE		名称 NAME	LR20XWラベル			図名/ DRAWING NAME	外装ラベル/ OUTER LABEL	
	使用推奨期限 (5 年)/ BEST USED BEFORE (5 Years)		工場 / FACTORY	JAPAN			図番/NUMBER		
	先付符号 (年)/ EXPIRY CODE (Years)		設計 DESIGN	製図 DRAWING	検印 CHECK	承認 APPROVAL	部品番/ PART NUMBER	BAM2SV02140K_T	
	ユザ専用符号/ USER'S SPECIFIC CODE			M.Tano	S.Makata	J.Kato			
符号なし / NO PRODUCTION CODE				2022. 09. 13	2022. 09. 13	2022. 09. 13			

記号 SYMBOL	年月日 DATE	訂正などの履歴 RECODE OR REVISION	証印 SIG.	検印 CHE.
制定	2019. 3. 25	パレット品番輸出仕様 ご了承用図面として/Drawing	和田	中田

部品番号 P. NUMBER	部品名/材料 P. NAME/MATERIAL	数量 QUANTITIES
①	製品/Product (LR20)	7,200
②	シュリンクフィルム(無地)/Shrink film ペット/PET	(79.7×220) x1,440
③	10コ入化粧箱/Display box for 10PCS コートボール紙/Board paper	720
④	100コ入外装箱/Outer carton for 100PCS A フルート/A Flute	72
⑤	接着(ホットメルト)/Adhesive	59x72
⑥	コーナーガード(上面)/Top corner guard	4
⑦	支柱(隅)/Top corner guard	4
⑧	PPバンド/P. P Belt	14m
⑨	パレット/Pallet (1100×1100×144)	1
⑩	下合紙(滑り止めシート)/Non slip coating sheet	1
⑪	パレット用天面シート(片面段ボール)/ Single faced corrugated fiberboard	1
⑫	ストレッチフィルム/Strech film	26m
⑬	パレットマークラベル/Pallet mark label	1

製品番号 Product No.	LR20XW/2SKXA		
質量 WEIGHT	N. W. 957.6 (Kg)	G. W. 996.5 (Kg)	Σ. W. 1016.5 (Kg)
m³	1.10 × 1.10 × 0.739 = 0.89419 (m³)		

注 記
REMARK

1. 箱の寸法は、内寸を示す。()内は、参考外寸を示す。
2. 詳細は、各部品図面参照の事。
3. 設計及び仕様は、予告なく変更することがある。

1. Inside dimensions are designated about box.
() shows outside dimensions.
2. Refer to the attached sheet for the detail.
3. Design and specification are subject to change without notice.

図 名
D. NAME

単1形/2コシュリンクパック 7,200コ積みパレット梱包仕様書
SIZE "D" 2S
SPECIFICATION SHEET OF PACKING FOR 7,200PCS

CAD登録番号
C. NUMBER

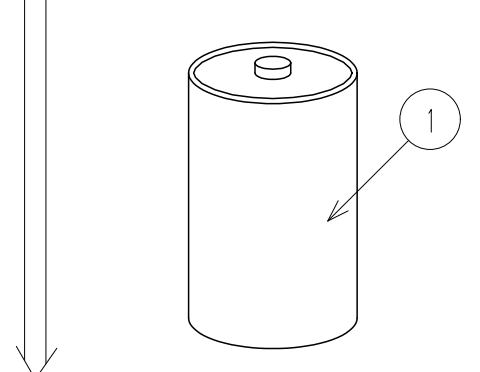
LR20_2SKX XW S, A

図面番号
D. NUMBER

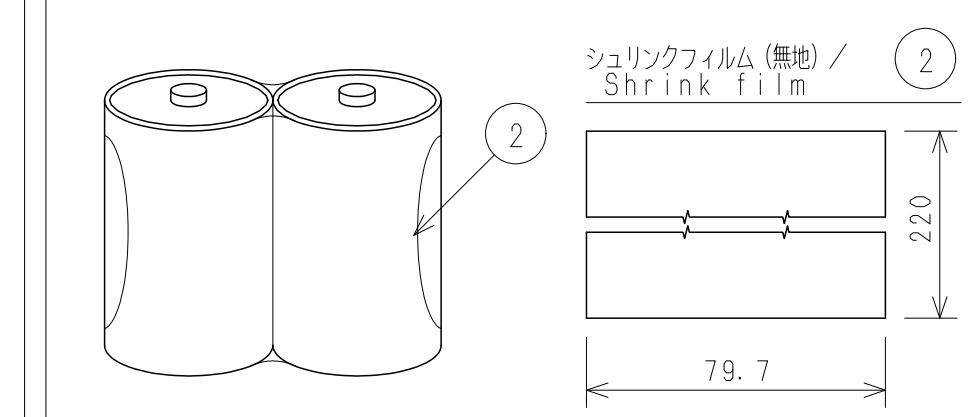
1-2S10KA100DW7KP_T. ALOA

設 計 DESIGN	製 図 DRAWN	検 査 CHECK	承認 APPROVAL
	K. Wada	S. Nakata	T. Kato
	2021.10.15	2021.10.15	2021.10.15

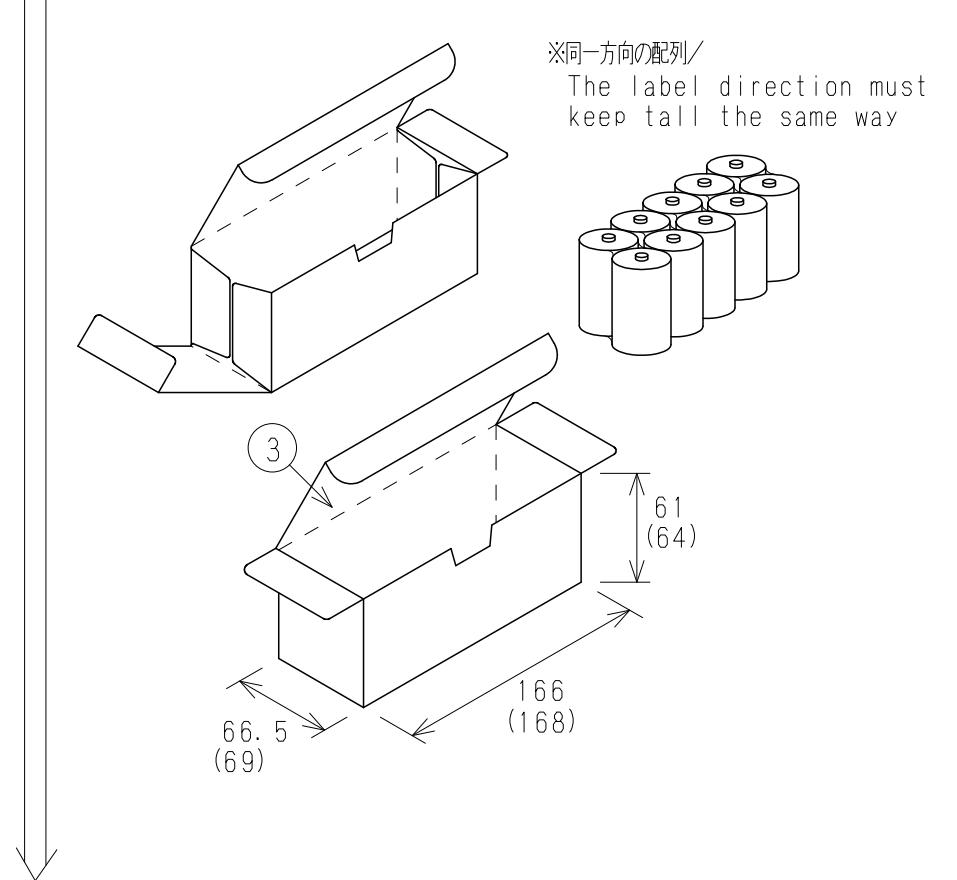
○ 製品/PRODUCT



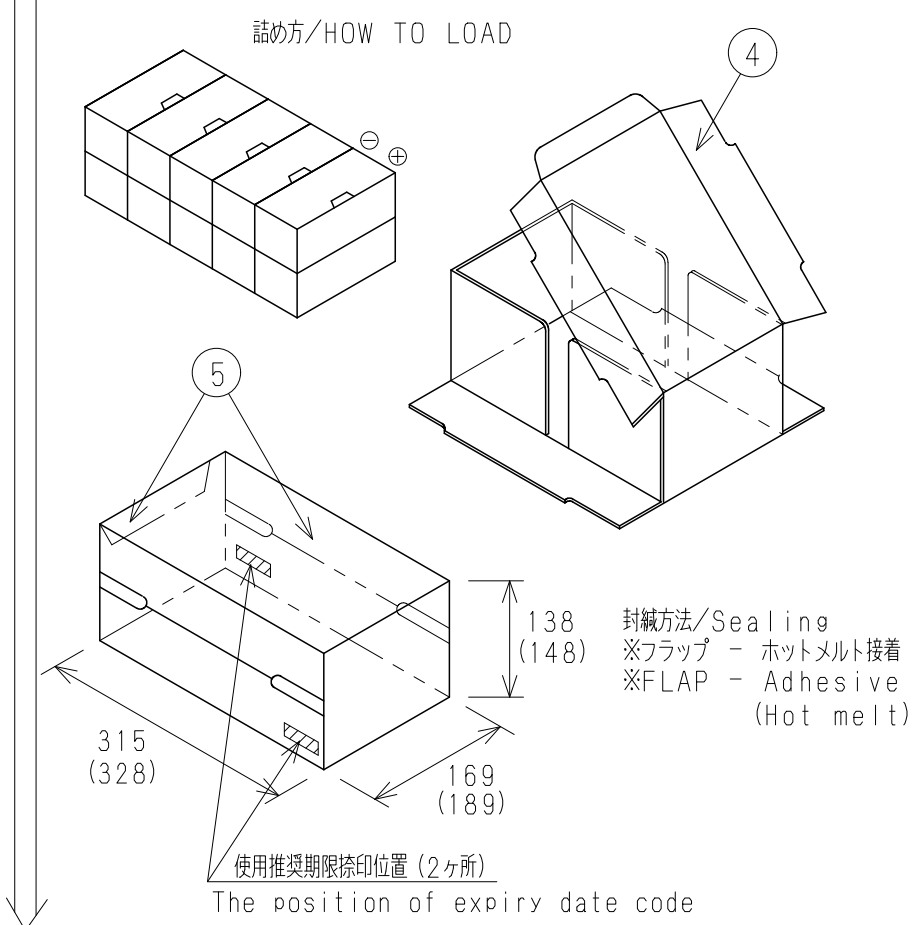
○ 2コシュリンクパック/2PCS SHRINK PACK



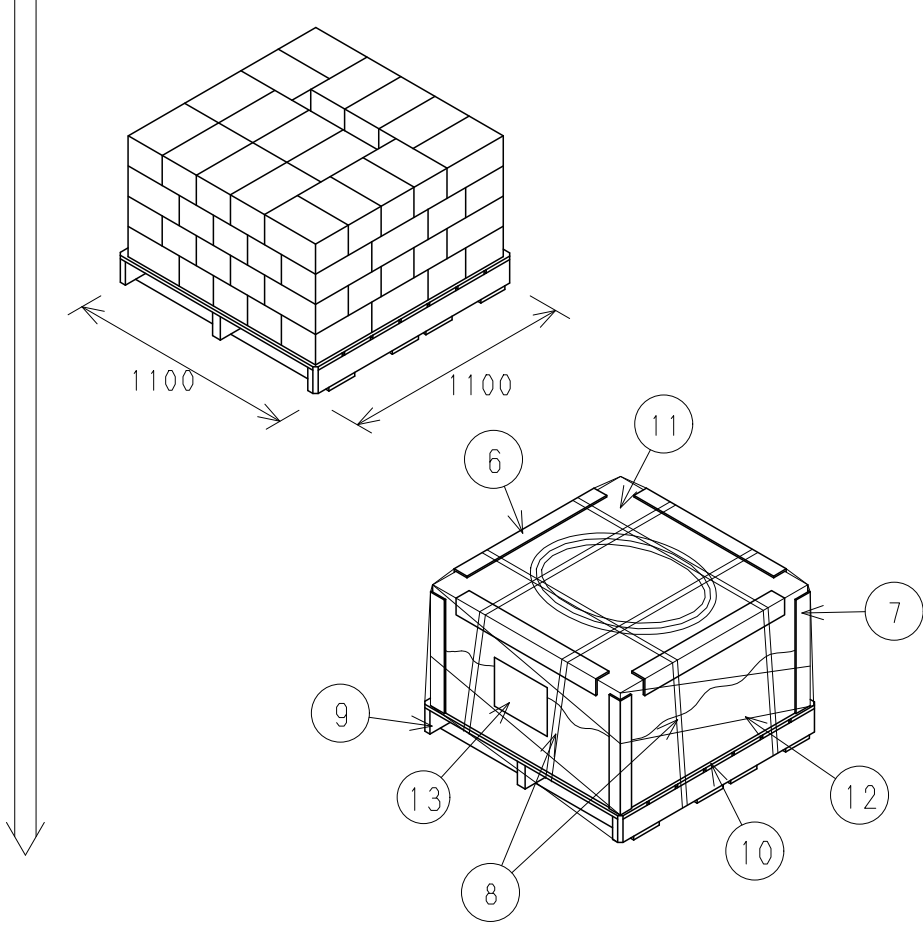
○ 10コ入化粧箱/DISPLAY BOX FOR 10PCS



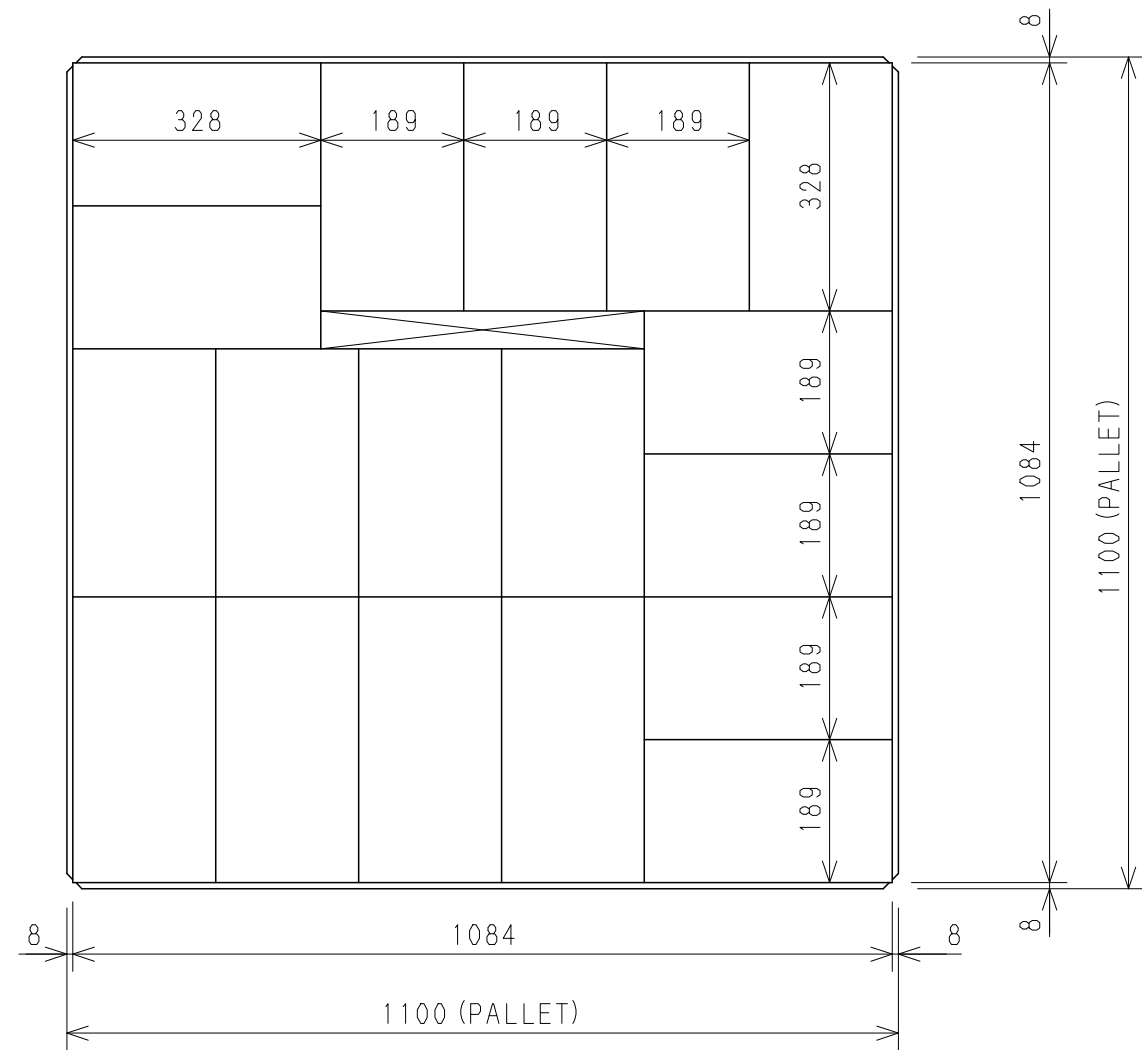
○ 100コ入外装箱/OUTER CARTON FOR 100PCS



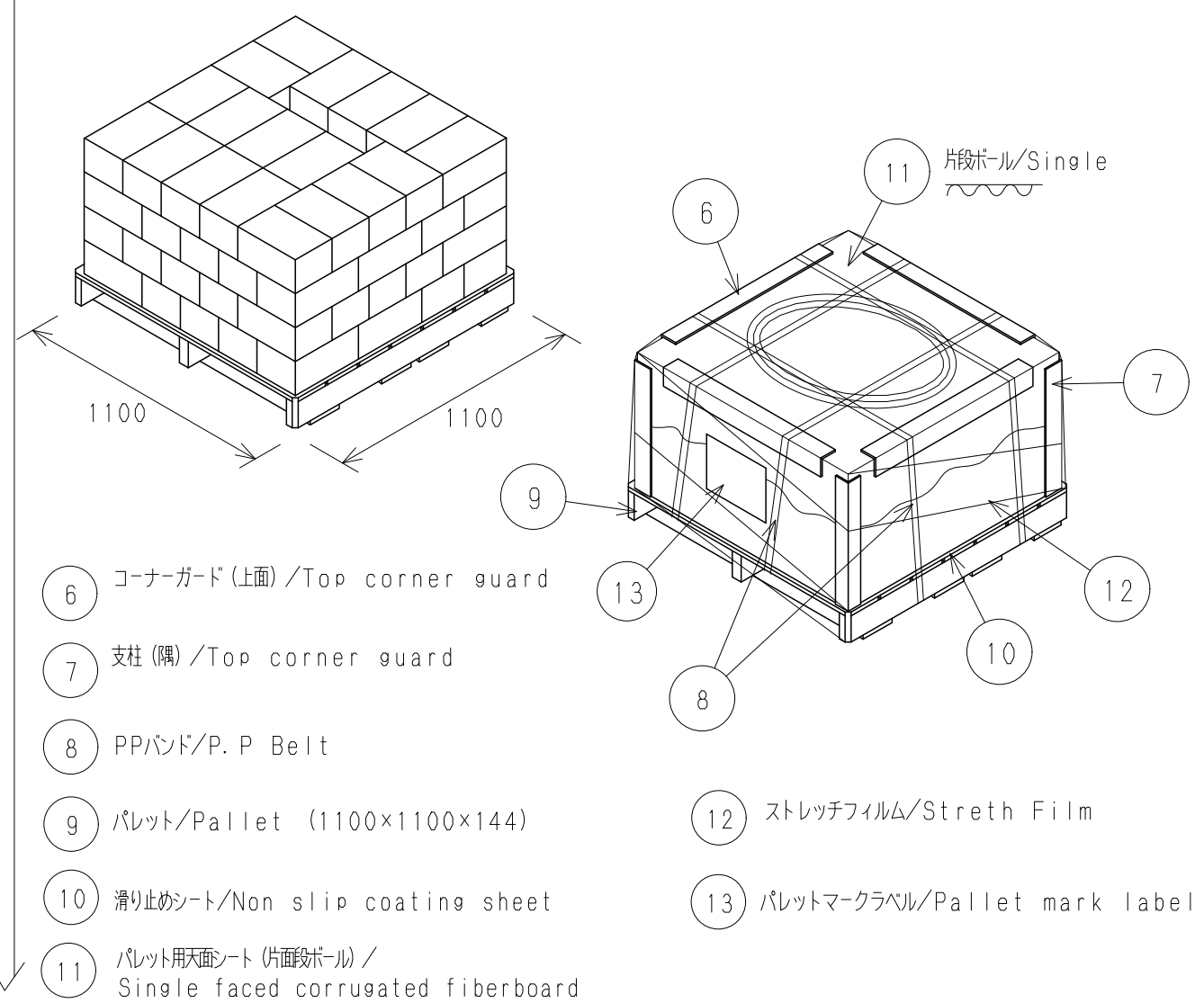
○ 7,200コ(72ケース)積みパレット梱包 /7,200PCS PALLET



○ 積み方/HOW TO LOAD

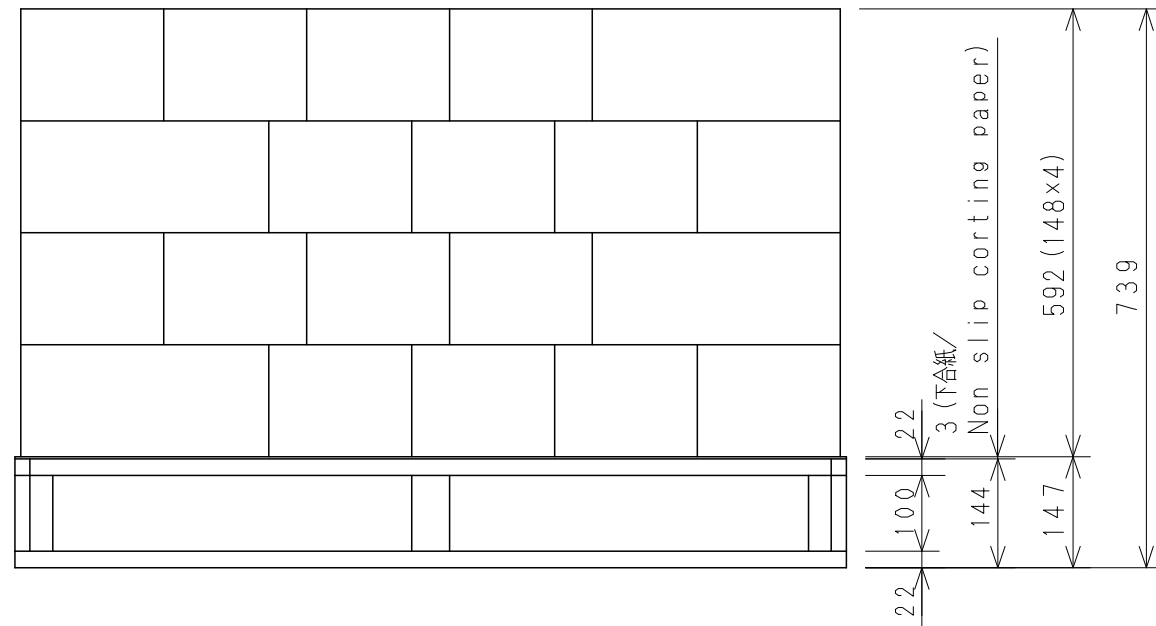


○ 72ケース (7, 200コ) 積パレット梱包/PALLET FOR 72 BOXES



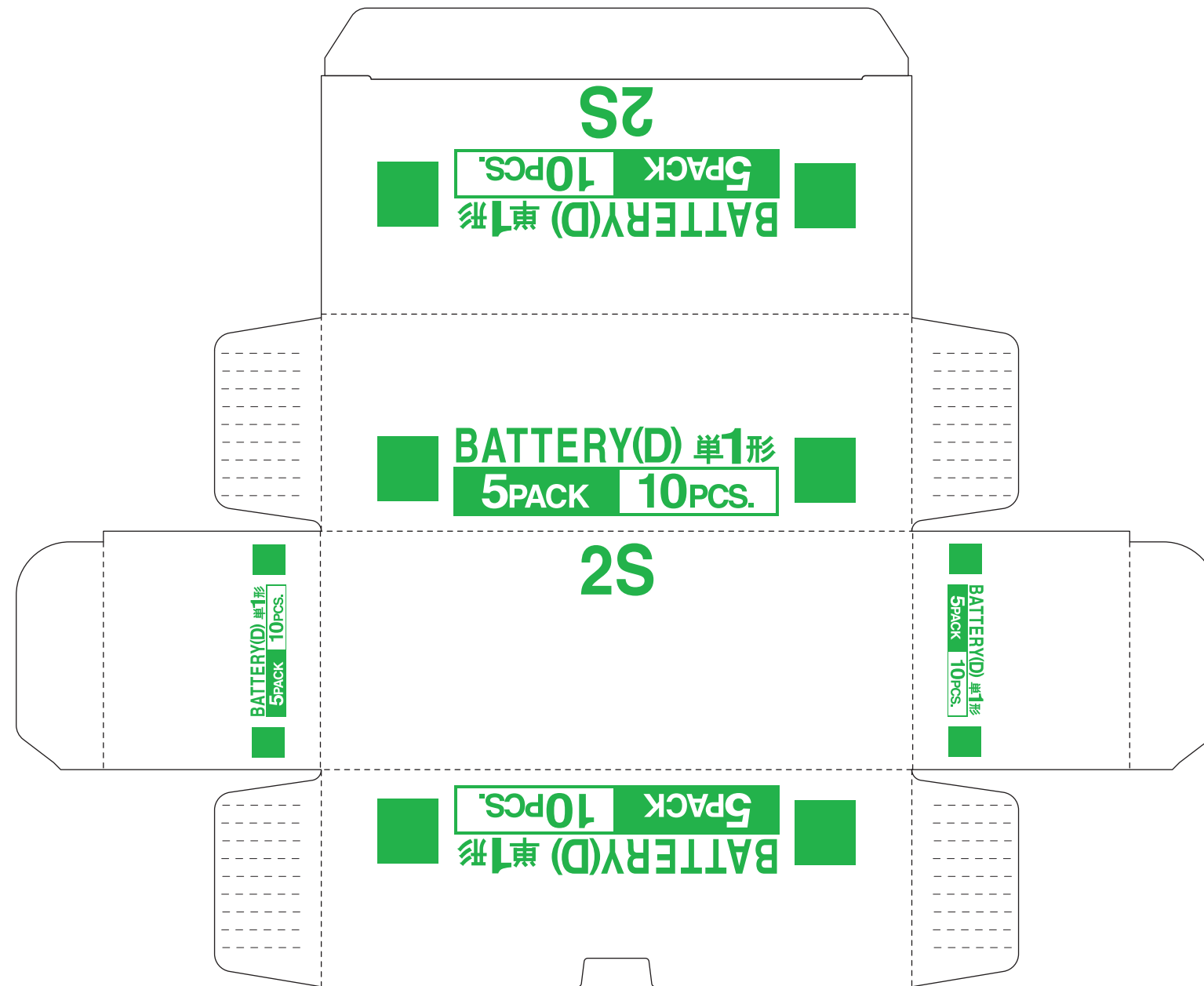
- ⑥ コーナーガード(上面) / Top corner guard
- ⑦ 支柱(隅) / Top corner guard
- ⑧ PPバンド/P. P Belt
- ⑨ パレット/Pallet (1100×1100×144)
- ⑩ 滑り止めシート/Non slip coating sheet
- ⑪ パレット用天面シート(片面段ボール) / Single faced corrugated fiberboard
- ⑫ ストレッチフィルム/Stretch Film
- ⑬ パレットマークラベル/Pallet mark label

(注記) (ANNOTATION)
 1. 詳細は、各部品図面参照の事。 1. REFER TO THE ATTACHED SHEET FOR THE DETAIL.
 2. 設計及び仕様は、予告なく変更することがある。 2. DESIGN AND SPECIFICATION ARE SUBJECT TO CHANGE WITHOUT NOTICE.



梱包明細 PACKING LIST	パレット積数 COUNT	1段	18 (ケース) ×	4 (段) =	72 ケース
	積載重量 PACKING	N. W (Kg)	1ケース当り	13.30 (Kg) ×	72ケース = 957.6Kg
		G. W (Kg)	1ケース当り	13.84 (Kg) ×	72ケース = 996.5Kg
		Σ. W (Kg)	996.5Kg + 20.0Kg (パレット重量) = 1,016.5Kg		
	容積 (m³)	1.10 (m) × 1.10 (m) × 0.739 (m) = 0.89419 (m³)			
単品重量 g/PC	133g				単1形/2コジュリンクバック 72ケース (72,000コ) 積みパレット SIZE D 2S SPECIFICATION SHEET OF PACKING FOR 72 BOXES
製品番号 Product Number	LR20XW/2SKXA				
設計 DSGND.	製図 DRWN.	検印 CHKD.	承認 APRVD.	図名 D. Name	
				CAD登録番号 C. No	
				図面番号 M. No	
				部品番号 P. No	

符号/SYMBOL	年月日/DATE	訂正などの履歴 /RECORD OR REVISION	記印/SIGNED	検印/CHECKED
△	2021.10.15	材質変更/Material Change	M.Tano	S.Nakata

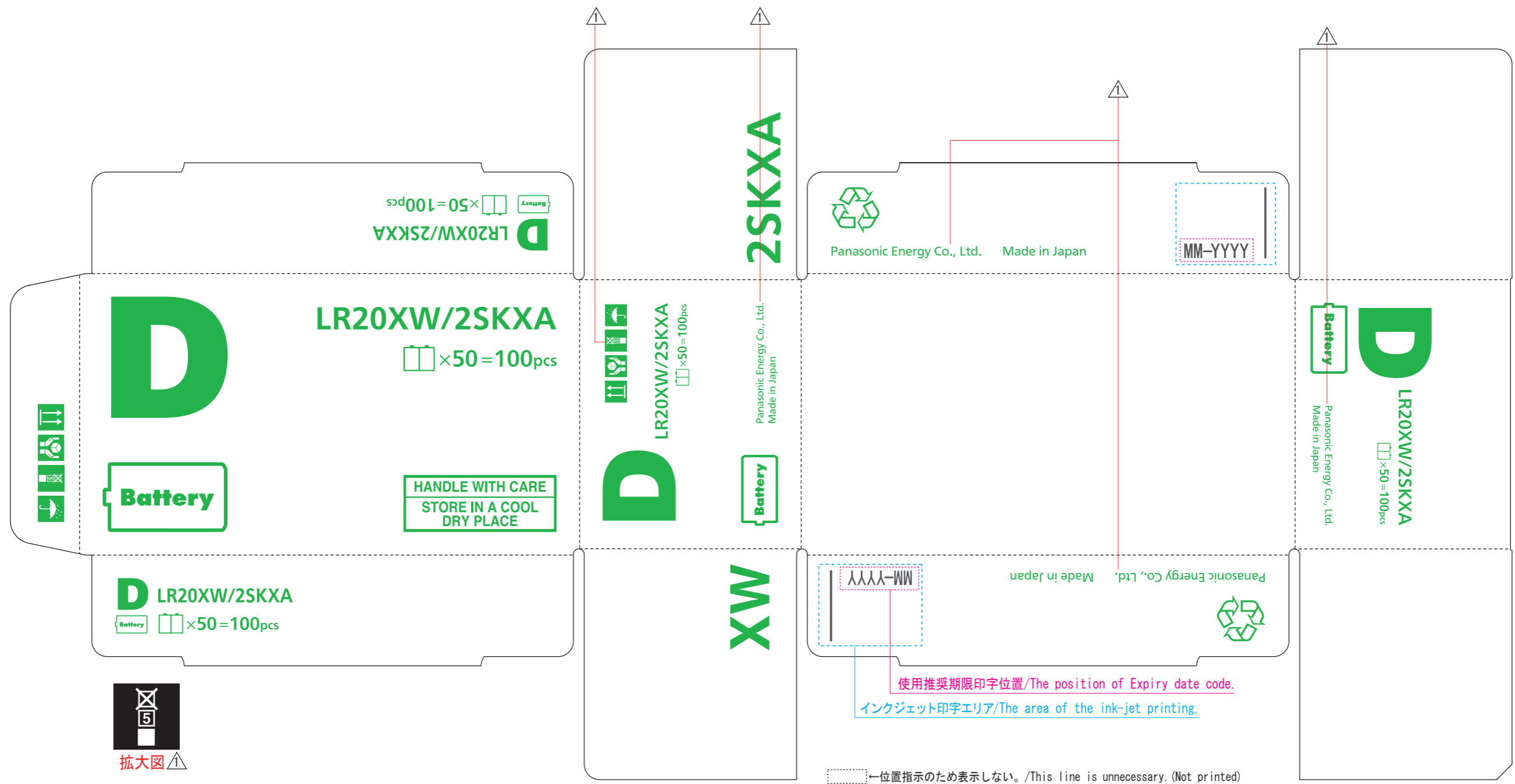


本図面は、現物とは若干、色調が異なります。 / ACTUAL COLOR IS DIFFERENT FROM THAT IN THIS SHEET.

(単位/Unit : mm)

符号表示位置/ THE POSITION OF DATE CODE	—	印刷使用色及び番号/ NECESSARY COLOR AND NUMBER FOR PRINT	AL	LR20/2ST	△コートボール /BOARD PAPER	S=60%	印刷/PRINTING			
絶縁リング 又は 端子板/ DIVORCE RING OR TERMINAL BASE	—	1 グリーン/Green(PANTONE3405C)	記号/SYMBOL	品番 / MODEL NUMBER	材質 / MATERIAL	倍率/MAGNIFICATION	処理・加工 / PROCESS	記事 / REMARK		
符号/ CODE	・製造符号 / PRODUCTION CODE ・使用推奨期限 (年) / BEST USED BEFORE (Years) ・先付符号 (年) / EXPIRY CODE (Years) ・ユーザー専用符号/ USER'S SPECIFIC CODE ・符号なし / NO PRODUCTION CODE	2 OY-710混合ニス/Varnish	名称	LR20/2ST CASE10 トッキ			図名/ DRAWING NAME	化粧箱 /DISPLAY BOX		
		3	工場 / FACTORY	JAPAN			図番/NUMBER			
		4	設計	M.Kawai	製	M.Tano	検	S.Nakata	承認	J.Kato
		5	図	2015.10.01	製	2021.10.15	図	2021.10.15	承認	2021.10.15
		6	計	2015.10.01	製	2021.10.15	図	2021.10.15	承認	2021.10.15
		7								
		8								
		9								
		10								

符号/SYMBOL	年月日/DATE	訂正などの履歴 /RECORD OR REVISION	記印/SIGNED	検印/CHECKED
⚠	2021.10.15	荷扱いマーク変更、社名変更、部品品番変更 (BAM7AA27110A→BAM7AA27110B)/Cargo handling mark change, company name change, Part number change.	<i>M. Tano</i>	<i>S. Nakata</i>



使用推奨期限印字位置/The position of Expiry date code.
 インクジェット印字エリア/The area of the ink-jet printing.

←位置指示のため表示しない。/This line is unnecessary. (Not printed)

本図面は、現物とは若干、色調が異なります。 / ACTUAL COLOR IS DIFFERENT FROM THAT IN THIS SHEET.

(単位/Unit: mm)

使用推奨期限の付与方法/Control of Expiry date code 例/Example	
生産年月/Production date	表示内容/Indication on body
2021年10月/October, 2021	10-2026
2021年11月/November, 2021	11-2026
2021年12月/December, 2021	12-2026
2022年1月/January, 2022	01-2027
ご注意/Attention 切替単位: 年12回/Frequency: Twelve times per a year	

符号表示位置/ THE POSITION OF DATE CODE	印刷使用色及び番号/ NECESSARY COLOR AND NUMBER FOR PRINT	AL	LR20XW/2SKXA	Aフルート/A FLUTE	S=35%	印刷/PRINTING				
絶縁リング 又は 端子板/ DIVORCE RING OR TERMINAL BASE	1 グリーン GREEN/D-110くさ 2	記号/SYMBOL	品番 / MODEL NUMBER	材質 / MATERIAL	倍率/MAGNIFICATION	処理・加工 / PROCESS				
符号/ CODE	3 インクジェット印字: 黒/Black	名称 NAME	LR20XW/2SKXA PC100			図名/ DRAWING NAME	外装箱/OUTER CARTON			
	4		工場 / FACTORY	JAPAN			図番/NUMBER			
	5			設計 DESIGN	M. Kawai	製 DRAWING	M. Tano	検 CHECK	S. Nakata	承認 APPROVAL
	6		2016.04.21	2021.10.15	2021.10.15	2021.10.15	部品番/ PART NUMBER	⚠ BAM7AA27110B_T		
	7									
	8									
	9									
	10									
	製造符号 / PRODUCTION CODE									
	・使用推奨期限(5年)/ BEST USED BEFORE (5 Years)									
先付符号(年)/ EXPIRY CODE (Years)										
専用符号/ USER'S SPECIFIC CODE										
符号なし / NO PRODUCTION CODE										