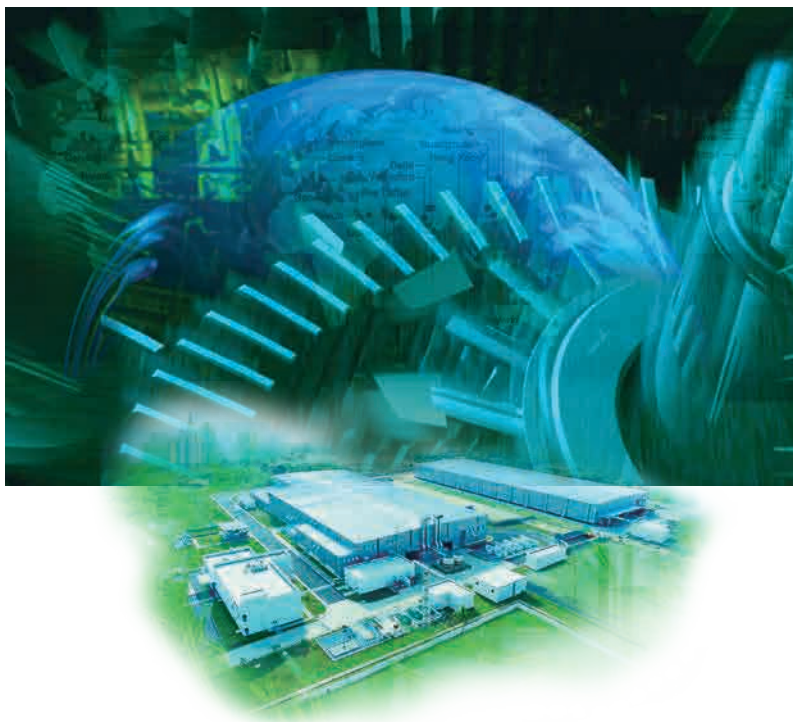


**World-Class Quality You Can Trust**

***TMEiC India Motor Factory***




***Motors & Generators  
Empowering the Future***

# From Design to Quality Control – Rest assured, all made the TMEiC way

TMEiC Corporation (TMEiC) stands proud as a key player in ensuring the continuous operation of industrial manufacturing around the world. Our large-capacity, high-speed motors and generators are found at the core of production facilities driving equipment and systems in a diverse array of fields such as metals, paper, chemicals, oil and gas, materials handling and mining.

Combining the industrial production experience of parent companies Toshiba and Mitsubishi Electric, TMEiC products are developed based on more than 200 years of expertise, leading to the manufacture of highly reliable products that receive excellent customer evaluations for their superior quality, durability, minimal maintenance and long service life.



**TMEiC**  
*India Motor Factory*

**TMEiC**  
*Japan Keihin Motor Factory*

**TMEiC**  
*Japan Nagasaki Motor Factory*

Superior performance from compact,  
global-standard Japan-designed  
**TM21-G Series**

# TMEiC-Made Strategic Global Motor and Drive Production in India

TMEiC expanded its global reach in 2016, with TMEiC Industrial Systems India Private Limited (TMEiC India, a 100% subsidiary of TMEiC Japan) establishing both motor and power electronics factories in Bengaluru, India, creating a strategic motor and drive base in the region.

We now manufacture the TM21-G Series of motors at our Keihin and Nagasaki factories in Japan and this new motor factory in India.

## TMEiC India Facilities



# TMEIC DNA ensures Indian facilities deliver same renowned product quality and reliability

## *TMEIC quality*

### *Vacuum impregnation equipment (VPI facilities)*

#### **Superior Insulation** Long Service Life

TMEIC motors and generators feature insulation quality second to none, a key factor for ensuring a long and reliable service life. Eliminating the need to frequently update or repair equipment helps to reduce costs and enables smoother, more efficient operations; features that contribute to maintaining the highest level of productivity.



Installing stator in VPI tank

## TM21-G Global Series – Medium-voltage Motor Production in India



### Final Assembly & Testing

Testing and evaluating the performance of medium-voltage (MV) motors are an important part of the quality assurance process at TMEiC. The Tumkur works modern test facility is equipped with state-of-the-art test and measurement devices. MV motors produced at the facilities are tested using the latest international test standards. They are also subjected to TMEiC's own additional testing and conform to the requirements of the domestic market as well. Of course, special tests can be conducted to ensure products meet specific customers' needs.

The test system itself is comprised of motor-generator (MG) sets capable of delivering voltages of 3.3, 6.6 and 11kV, respectively, based on the voltage rating to be tested. The MG used is paired with excitation control systems and MV drives, and circuit breaker panels are selected with the click of an icon via the graphic user interface (GUI). This saves significant time and effort in the testing process.



Combined actual load test

# Same policies, systems and management guarantee Japanese quality worldwide

## TMEIC Quality Management System

Design Review (DR), Workstation System (WSS), and procurement management are the pillars of the TMEIC Quality Management System (QMS). This is known as the “Three Principal Management Policy” of TMEIC. The Indian factory applies QMS for approval of all parts and materials procured, and to verify and certify that all of the first products manufactured at the facilities are built with TMEIC quality.



## QMS (Knowledge transfer to TMEIC India)

### Design Review System

- DR** ■ To be conducted at every stage, from quotation to use in the field
- Ensure that every revision requested by the customer is included.

Product quality is ensured by the First Production Certification process and our procurement management system. Each motor is produced according to a technical collaboration agreement that covers everything from design and parts procurement through manufacturing and testing.



First product (prototype) certification and process verification



Certification by TMEIC Japan  
**TMEIC**

### Vendor Evaluation Process

#### Procurement management

### Workstation System (WSS)

#### Work process management

- Workstation configuration separates each manufacturing process
- Only components that pass inspection continue on to the next process

Motor components are classified and evaluated by TMEIC Japan and India, respectively, and certified by the Tokyo headquarters as the final step, thereby ensuring quality is guaranteed.

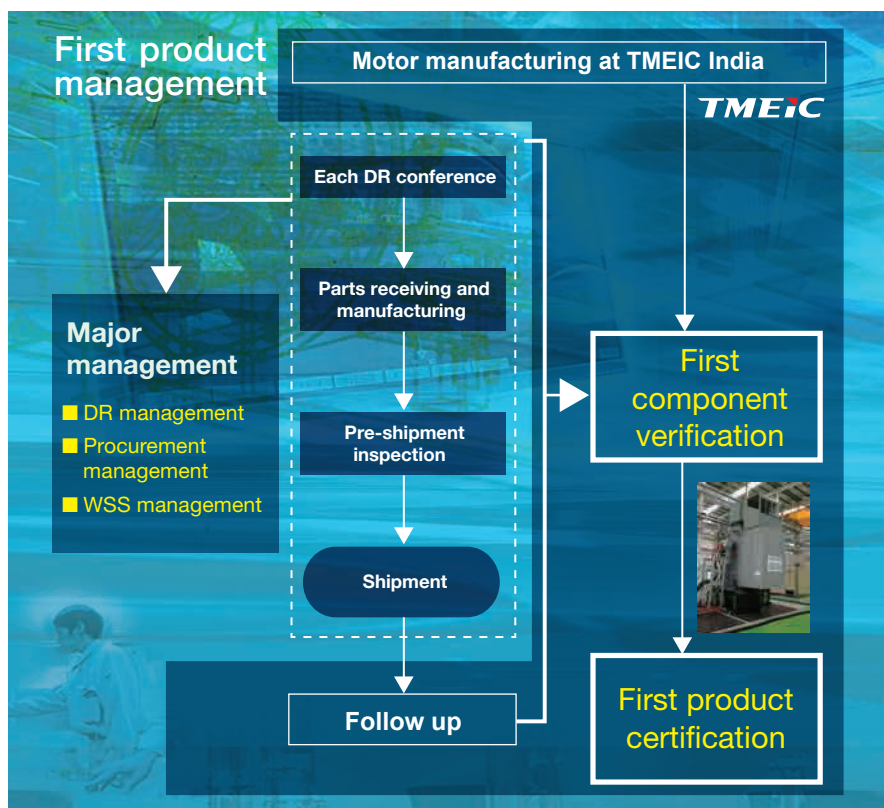
# Maintaining manufacturing quality

TMEIC India has strictly defined the necessary skills and competence required to maintain the manufacturing quality synonymous with the TMEIC brand. The motor factory has introduced a certification program that evaluates each skill, and regularly re-evaluates personnel to motivate operators to hone their skill and evaluate the effectiveness of the training system. The trainers who teach subordinate employees the TMEIC manufacturing standards are supervisors that were educated in Japan.



## TMEIC— Certifications and Credentials

The TMEIC motor factory has obtained ISO9001:2015 QMS certification, which is testimony to having established a viable quality system within a year of starting factory operations.



## Quality Management System TMEIC India motor factory

### First product certification management

The approval to start production is not given until after manufacturing quality, performance and other parameters are comprehensively reviewed for the first product manufactured. Additionally, verification of “Expected Value Realization”

# Superior performance from compact, global-standard Japan-designed TM21-G Series



Actual product  
for mining conveyor applications  
1400kW-6P-6.6kV Fr.500  
IC611 VFD starting



## TM21-G Global Series Motors

### Modular Motors – TEAAC Motors and TEWAC Motors

Parameters	Select	Details of Description	
		TEAAC	TEWAC
Output power	MV class	160kW ~ 23,000kW	
	LV class	160kW ~ 1,500kW	
Rated voltage	MV class	2,300V ~ 11,000V	
	LV class	~ 690V	
Frame range	IEC60034	400 ~ 900	
Poles	Horizontal	2 ~ 14P	
	Vertical	4 ~ 18P	
Frequency	MV class	50Hz/60Hz	
	MV variable	~ 72Hz via MV inverter	
	LV variable	~ 72Hz via LV inverter	
Degree of protection	IEC60034	IP55/IP56	
Cooling type		IC611, IC616, IC666	IC81W, IC86W
Insulation class		Class-F (155°C)	
Temp. rise		as per Class-B 80K(R) / 90K(RTD)	
Mounting		Horizontal (IMB3), Vertical (IMV1)	
Terminal box		Phase-segregated/Air insulation	
Shaft material		Carbon steel/CRMO steel	
Direction of rotation		2P/4P/6P: Unidirectional; 8P-: Bi-directional	
Hazardous area classification		IEC Zone2 explosive gas area with Ex ec certification IEC Zone22 non-conductive explosive dust area with Ex tc certification	
Coolant temp.		Ambient temp. -20 ~ +40°C (based on IEC)	Water temp. 25°C (based on IEC)
Max ambient temp.		55°C (or more on request)	40°C (or more on request)
Altitude		< 1000m (base) (more on request)	
Location		Indoor/Outdoor	
Bearings		Anti-friction/Sleeve	
Bearing insulation		Standard: for NDE; Optional: for both NDE and DE	
Standards		IEC, IS, (standard); NEMA MG1 (option); JEC (option)	
Temp. sensors		Winding 6 RTD; RTD Pt100Ω@0°C standard; RTD for bearings optional	



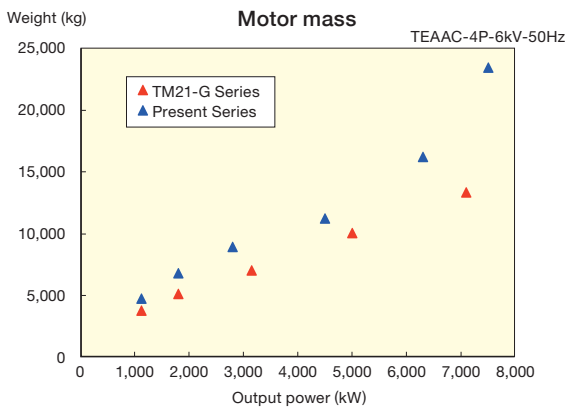
- Amazingly small footprint
- Minimizing weight
- Compliance to International Standards
- Minimal maintenance required
- Exceptional reliability

Specially designed for a small footprint and easy operation, TM21-G Series motors require less time for installation, maintenance and replacement while ensuring the high performance synonymous with the TMEIC name. All motors offer a range of benefits that answer the diversified needs of our customers today.

# Nothing Quite Like It — Experience a TM21-G

## Lightweight motors

### World-class Lightweight Design

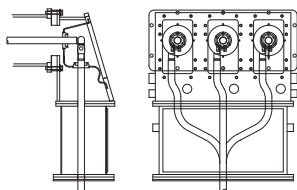


The optimal design of these world-class motors has realized a 20–30% weight reduction compared to our previous motor series. This contributes to various benefits including reduced shipping cost, lower foundation load/crane capacity and simplified maintenance.

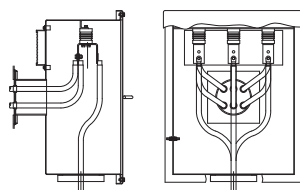
## Main circuit terminal box

### Choice of Terminal Boxes

Phase-segregated terminal box



Standard terminal box



A variety of terminal boxes are available as standard equipment in response to market demand. Choices include a standard terminal box, a phase-segregated terminal box and a large, a terminal box with large double terminals compliant with NEMA standards.

## Junction box

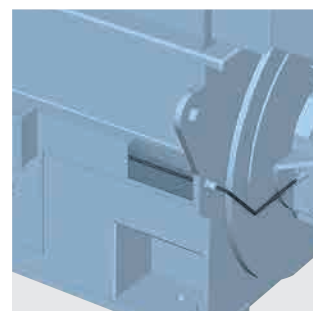
### Standard Material is Stainless Steel



Instrument cables are routed into a single junction box and the incorporation of clamp-type terminals as standard simplifies the cable connection process. As a result, external cable connection work is simplified reducing installation times. Furthermore, the junction box is made of stainless steel, increasing operating durability under harsh environments.

## Cable duct

### Replacement So Easy a Novice Can Do It



Instrument and space heater cables pass through an IP55 cable duct that is hermetically sealed using steel plates. This helps to ensure motor operation even in harsh environments. Additionally the iron piping and armored cables required when running cables alongside the motor surface have been eliminated. As a result, less time and effort are required when replacing instruments, and it's so easy virtually anyone can do it.

# Indian factory delivering superior quality in every product

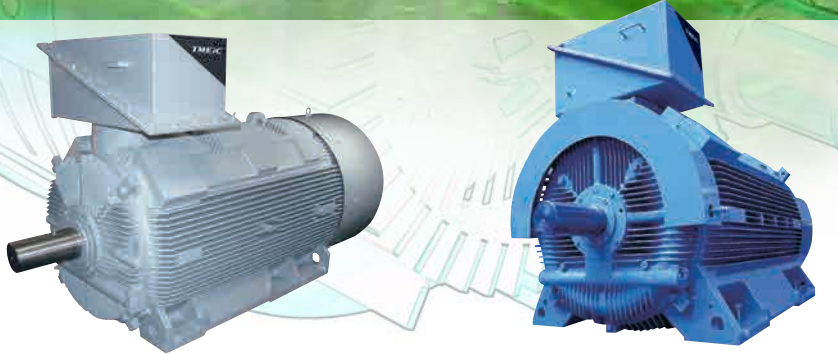
**Exceptional Reliability – Amazing Efficiency**

TM21-GF Series Fr.315–560

Variety of models to match diversified industrial needs

Actual product for IPP fan applications (FDF)

225kW-4P-6.6kV Fr.315 IC411



TM21-GF Series Fr.315–400

TM21-GF Series Fr.450–560



## State-of-the-art heat ventilation analysis

Impressive reduction in size realizes space-saving installation and lower shipping cost. As air duct and water cooler are not required, the cost of maintenance is reduced too.

- Space-saving installation
- Transportation/Shipping cost reduced
- Maintenance cost reduced

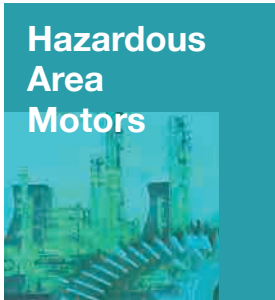
## Designed and built based on extensive experience

Decades of experience are applied in the production process, realizing stator windings and rotor cages of the highest quality.

- Stable, nonstop operation
- Low vibration, long service life
- Clean/Safe work environment
- Minimal maintenance

## TM21-G Global Series Motors TEFC Motors

Parameters	Select	Details of Description
Output power	MV class	160kW ~ 2,000kW
	LV class	160kW ~ 1,500kW
Rated voltage	MV class	2,300V ~ 6,900V
	LV class	~ 690V
Frame range	IEC60034	315 ~ 560
Poles	Horizontal	2 ~ 8P
	Vertical	4 ~ 8P
Frequency	MV class	50Hz/60Hz
	MV variable	~ 72Hz via MV inverter
	LV variable	~ 72Hz via LV inverter
Degree of protection	IEC60034	IP55/IP56
Cooling type	Variable torque	IC411
	Constant torque	IC416
Insulation class		Class-F (155°C)
Temp. rise		as per Class-B 80K(R) / 90K(RTD)
Mounting		Horizontal (IMB3), Vertical (IMV1) Foot cum flange (IMB35)
Terminal box		Phase-segregated/Air insulation
Shaft material		Carbon steel/CRMO steel
Direction of rotation		2P: Unidirectional; 4P-: Bi-directional
Hazardous area classification		IEC Zone2 explosive gas area with Ex ec certification IEC Zone22 non-conductive explosive dust area with Ex tc certification
Coolant temp.		-20 ~ +40°C (based on IEC)
Max ambient temp.		55°C (or more on request)
Altitude		<1000m (base) (more on request)
Location		Indoor/Outdoor
Bearings		Anti-friction
Bearing insulation		Standard: None; Optional: for NDE
Standards		IEC, IS, (standard); NEMA MG1 (option); JEC (option)
Temp. sensors		Winding 6 RTD; RTD Pt100Ω@0°C standard; RTD for bearings optional



## Hazardous Area Motors

## Hazardous Area Motor Lineup for Major Industrial Markets – Global-standard performance, safety and reliability from India

Degree of protection  
**IP55/IP56**

Cooling type  
**IC611/IC616/IC666  
IC81W/IC86W**

Mounting  
**IM B3/IM V1**



Totally Enclosed Air-to-Air-Cooled  
**TEAAC**

Totally Enclosed Water-to-Air-Cooled  
**TEWAC**

TEAAC, TEWAC	
Motor type	Induction motor
Rated voltage	up to 11,000V
Hazardous area classification	Zone2/Zone22
Insulation class	Thermal class 155 (F)
Frame range	400 ~ 900
Bearings	Anti-friction/Sleeve
Cage material	Copper
Frame material	Steel
Standards	IEC Ex, ATEX

**Ex ec**  
Increased Safety

**Ex tc**  
Dust Exclusion

Degree of protection  
**IP55/IP56**

Cooling type  
**IC411/IC416**

Mounting  
**IM B3/IM V1**



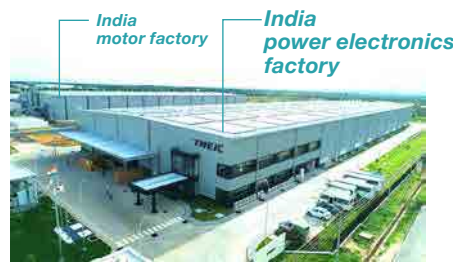
Totally Enclosed Fan-Cooled  
**TEFC**

TEFC	
Motor type	Induction motor
Rated voltage	up to 6,900V
Hazardous area classification	Zone2/Zone22
Insulation class	Thermal class 155 (F)
Frame range	315 ~ 560
Bearings	Anti-friction
Cage material	Aluminum/Copper
Frame material	Cast iron
Standards	IEC Ex, ATEX



## Power Electronics Factory

Power electronics factory next to motor factory enables TMEIC to offer both motors and drives. TMEIC's superior productivity delivers machinery that contributes to reducing energy costs and CO<sub>2</sub>



India plant capable of supplying TMdrive-MVe2.



TMdrive-MVe2

### VFD features

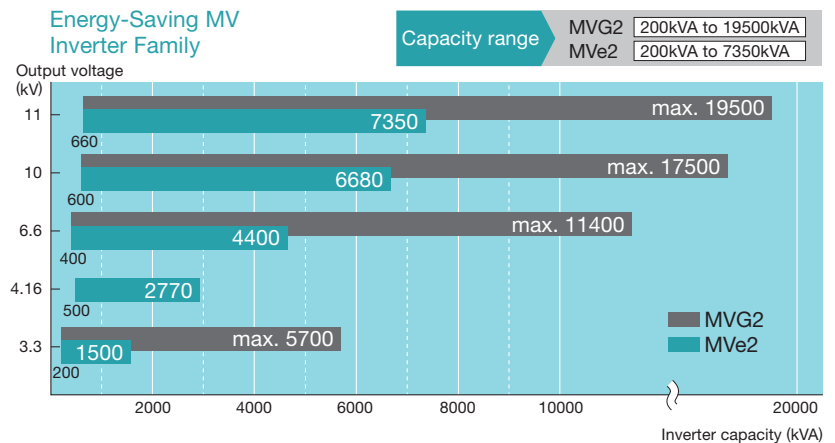
#### Combined test with motor and VFD

- Up to 100% for starting current
- High power factor
- High efficiency
- Minimal maintenance required
- Ultrahigh-speed operation
- Power regeneration (TMdrive-MVe2)
- Reactive power compensation (TMdrive-MVe2)



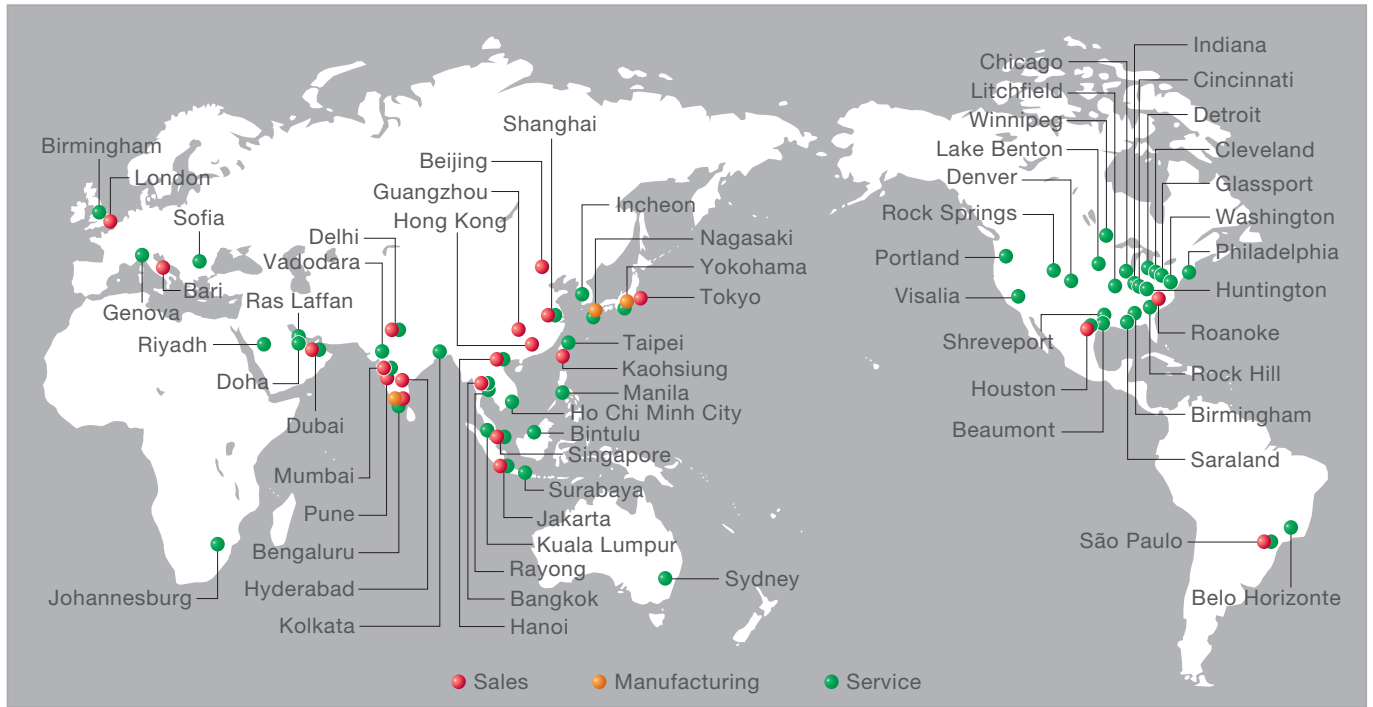
Combined test with inverter drive

### Energy-Saving MV Inverter Family



TMEIC also manufactures PV-PCS and UPS products in its Indian power electronics factory.

# Global Sales/Manufacturing/Service Network



[www.tmeic.com](http://www.tmeic.com)

All specifications in this document are subject to change without notice. This brochure is provided free of charge and without obligation to the reader or TMEIC, and is for the purpose of information only. TMEIC neither accepts nor implies any liability regarding the information provided herein.

©2024 TMEIC Corporation, Japan  
All rights reserved.