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Parties outside the secret

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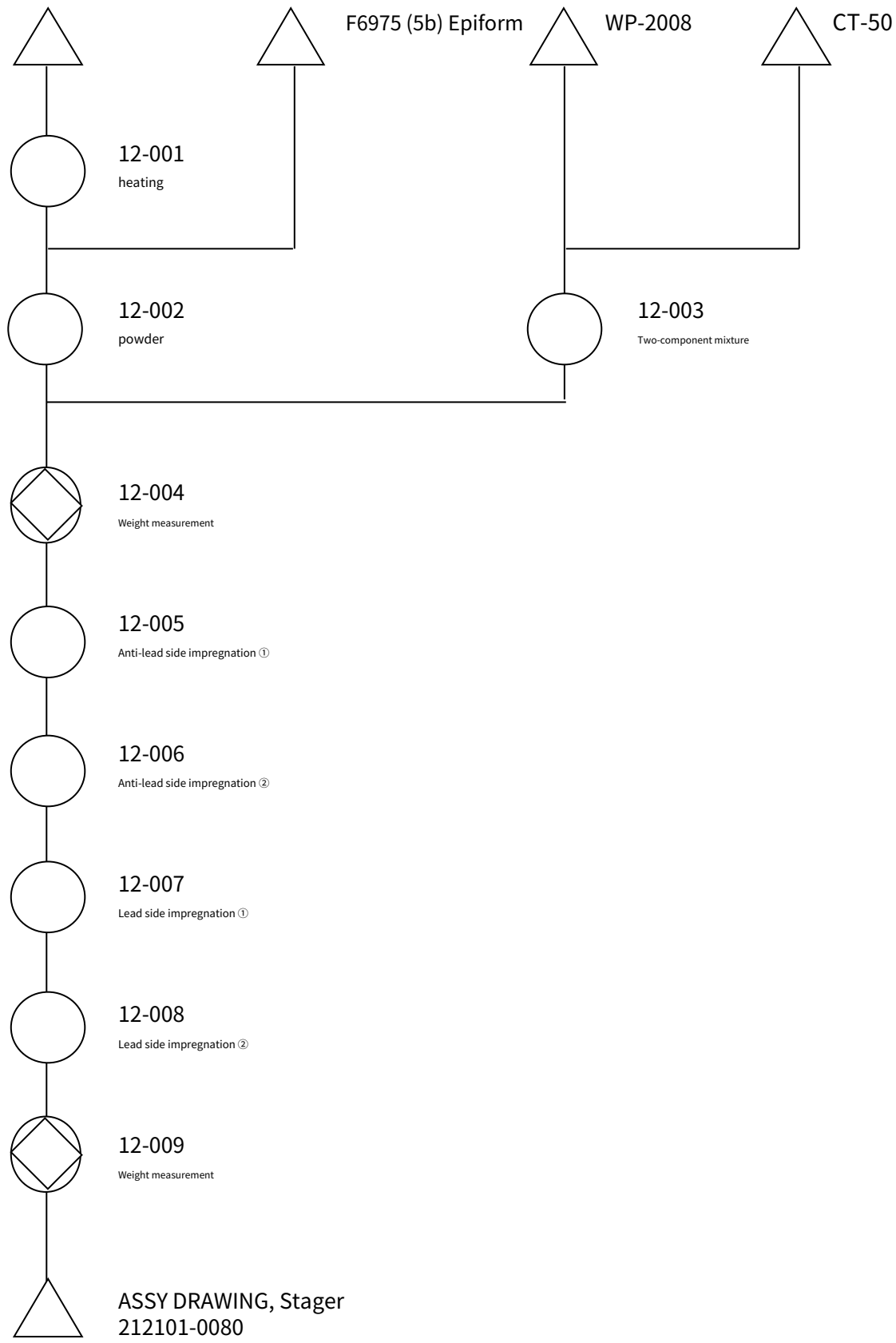
Structure system diagram	Issuing section: Electric manufacturing department 2 production engineering room 4 / date of creation: 2/8/2016	Approval: 吉 6/02/08 田	examination: 小 6/02/08 坂	examination: 山 6/02/08 地			Distribution cloth Ahead					

Line name	Assembly part number, part name	name / For quantity confirmation
690A MG Stereoline	212100-0080 Stater S / A, Mo Tar	Priority management designation: S 13, C 1, C 2, ○ W
System No. Systematic name <1/1> 12 Heated powder impregnation	Model Product Name 212101-0080 ASSY DRAWING, statuser	Delivery destination, reserved vehicle type Toyota 690A



No.	Revision Date	Revision item	Reason for revision	Revised person
△3	1/23/2017	Cleaning the output line clamp	Reflects the examination results during the initial flow	Kosaka

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Process control statement

Issuing section	Approval	examination	examination
Electric manufacturing department 2 production engineering room 4	吉田 6/02/08	小坂 6/02/08	山地 6/02/08
date of creation: 2/8/2016			

Distribution cloth Ahead

System No. -System diagram number Line name

690A MG Stereoline

Assembly part number, part name

212100-0080

Stater S / A, Mo Tar

name: For initial flow

Priority management designation: SCC 13 1 2

Process No. 12 | Process name: Heated powder impregnation | Station name | <1/1>

Model Product Name

212100-0080

Stater S / A, Mo Tar

Delivery destination, reserved vehicle type

Toyota

690A

<Process specifications>

Heat the work and carry out powder coating and impregnation coating.

<Equipment>

NO.1 equipment

Equipment machine number	STM-5671, STM-5672
Equipment name	Heated powder impregnation machine
Model	————
capacity	8kW, 2.5t
Manufacturer name	Powertre Machinery Department

<Material>

NO.1 material

Material name: Epoxy powder resin (F-6975 (5b))

Material type name: Epoxy resin

Basic unit: 15kg

Maker: SomaR

NO.2 Material

Material name: Unsaturated polyester resin (WP-2008)

Material type name: Polyester resin

Basic unit: 18kg

Manufacturer: Hitachi Kasei

NO.3 Material

Material name: Hardener (CT-50)

Material type name: Cyclohexane, etc.

Basic unit: 270g

Manufacturer: Hitachi Kasei

<Tools>

NO.1 tool

Tool name: Laser displacement sensor (IL-100)

Manufacturer name: Keyence

NO.2 Tool

Tool name: Radiation thermometer (FT-H20)

Manufacturer name: Keyence

NO.3 Tool

Tool name: Dust collector (Pie-45SD)

Manufacturer name: Amano

NO.4 Tools

Tool name: Contact thermometer (N-331K-01)

Manufacturer name: Anritsu

NO.5 Tool

Tool name: Robotics pencil (3ND06G15)

Cornrows (DPU-F510)

Manufacturer name: Hashin

NO.6 Tool

Tool name: DC power supply (PAT40-200T) x 2

Manufacturer name: KIKUSUI

NO.7 Tool

Tool name: IH power supply (HFR15C11K-2 (outside), HFR5C11K-2 (inside))

Manufacturer name: Fuji Electric

<Processing conditions>

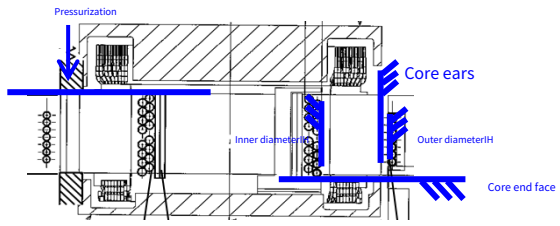
① Heating	
Energizing current	172 ± 8A
Energizing time	3.7s x 7 x 3 phases
IH output (inside / outside)	32 ± 8% / 82 ± 16%
Heating time	80s + 5s, -3s
Coil temperature at the end of heating	180 ± 20 °C
Energizing clamp force	75 ± 50N
Core pressure during heating	100N or more
② Powder	
Sub-bottle powder levitation rate	1.2 ± 0.15
Child bottle air flow rate	0.3 ± 0.1 ml / s
Coil temperature at the start of powder	175 ± 35 °C
Powder immersion time / number of times	0.4 ± 0.1s / 5 times
Powder immersion depth	84 ± 4mm
Powder perforated plate	Thickness 10 mm, hole diameter 5 μ
③ Impregnation	
Molding side coating ① Rotation speed	4.0 ± 0.3 rpm
Coil temperature at the start of coating on the molding side	135 ± 15 °C
Molding side coating amount ①	19.25g or more
Molding side application ① Position	R81.7 ± 0.25mm
Molding side application ① Start slot	Between 8-9 slots
Molding side application ① Time	15 ± 0.5s
Molding side coating amount ②	1.25g or more
Molding side coating ② Position	R7 4.7 ± 0.25mm
Molding side application ② Start slot	Between 44-45 slot
Molding side application ② Time	10 ± 0.5s
Molding side coating ② Rotation speed	6.0 ± 0.3 rpm
Twist side application ① ② Rotation speed	4.0 ± 0.3 rpm
Twist side coating amount ①	20.25g or more
Twist side application ① Position	R90 ± 0.25mm
Twist side application ① Start slot	40slot
Twist side application ① Time	15 ± 0.5s
Twist side coating amount ②	12.25g or more
Twist side application ② position	R84 ± 0.25mm
Twist side application ② Start slot	4slot
Twist side application ② Time	15 ± 0.5s
Unis Nozle inner diameter	Φ4mm
Unis Nozle height (when applying anti-lead)	93.0 + 10 / -0.5mm
Unis Nozle height (when applying lead)	104.3 + 10 / -0.5mm
Varnish mixing time	30min (45 steps) or more
Unistank temperature	25 ± 15 °C
Unistank pressure	0.2 ± 0.15MPa
Cycle time	100s x 2 units
Potlife after mixing varnish	19th

<Working method>

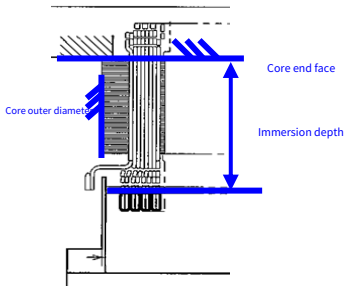
1. Wow Put the cou into the equipment. (Twist side: heaven)
2. Wow Heat the cou.
3. Wow Apply powder to the cou.
4. Wow Weigh the cou.
5. Wow Invert Kuu. (Molding side: heaven)
6. Wow Rotate the cou and apply varnish (① → ②).
7. Wow Invert Kuu. (Twist side: heaven)
8. Wow Rotate the cou and apply varnish (twist side application ①).
9. Wow Rotate the cou and apply varnish (twist side application ②).
10. Wow Weigh the cou.
11. Wow Discharge the cou.

<Processing drawing>

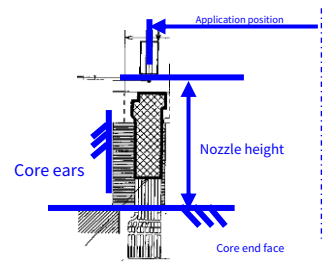
[Heating part]



[Powder part]



[Immersion part]



<Regular cleaning>

Below, for items, use Fent, etc.

1 / Perform regular cleaning directly

- Input check [heating]
- Heating st part
- Output line clamp (1 / direct) (Implemented at the time of work in process)
- Powder processing section check
- Powder supply unit (2 / direct)
- Input check [impregnation] (2 / direct)
- Pre-processing weighing ST
- Impregnated material application ST (2 / direct)
- Machining part weighing ST
- Discharge check (2 / direct)
- Application nozzle
- Impregnated material tank

<Daily inspection>

- Check based on the daily inspection check sheet
- Implementation based on the refueling guidance sheet

<Defective product treatment>

- The work of the energizing clamp Np G is re-introduced.
- The pre-powder temperature NG is not coated with powder and is re-injected after discharge.

No.	Revision Date	Revision item	Reason for revision	Revised person
△3	1/23/2017	Cleaning the output line clamp	Reflects the examination results during the initial flow	Kosaka
△2	20161010	Change of control value of heating current value	Clerical corrections	Mountains
△1	20160810	Change of standard for varnish coating amount	Added as a countermeasure for problems during initial flow	Mountains

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Process control statement

Issuing section	Approval	examination	examination	Distribution cloth Ahead
Electric manufacturing department 2 production engineering room 4	吉 6/02/08 田	小 6/02/08 坂	山 6/02/08 地	
date of creation: 2/8/2016				

System No. -System diagram number Line name	Assembly part number, part name	name
690A MG Stereoline	212100-0080 Stater S / A, Mo Tar	For initial flow
		Priority management designation: SCCC 13 1 2 17 17

Process No. / Process name / Station name <2/2>	Model Product Name	Delivery destination, reserved vehicle type
12 Heated powder impregnation	212100-0080 Stater S / A, Mo Tar	Toyota 690A

<Quality>

		Characteristic / Measuring instrument	Management method: Management interval	Management method: Management method	Management method: Administrator	Process capability σ, X, Cp, Cpk	remarks	Quality ID Relationship criteria
	1	Main air pressure 0.4 ± 0.05MPa Visual indicator (0.05MPa)	1 / Direct (at the time of work)	Condition management Check sheet	worker			
	2	IH external output 32 ± 8% This machine (1%)	1 / Direct (at the time of work)	Condition management Check sheet	worker			
	3	IH internal output 82 ± 16% This machine (1%)	1 / Direct (at the time of work)	Condition management Check sheet	worker			
	Four	Energizing current 172 ± 8A This machine (1A)	1 / Direct (at the time of work)	Condition management Check sheet	worker			
	Five	Coil temperature 180 ± 20 ℃ when heating is completed This machine (1 ℃)	1 / Direct (at the time of work)	Condition management Check sheet	worker			
	6	Powder vial air flow rate 0.3 ± 0.1 ml / s Visual indicator (0.01 ml / s)	1 / Direct (at the time of work)	Condition management Check sheet	worker			
	7	Coil temperature at the start of powder 175 ± 35 ℃ This machine (1 ℃)	1 / Direct (at the time of work)	Condition management Check sheet	worker			
	8	Molding side coating amount ① Target value ± 0.75 g Weighing scale (0.1g)	1 / Direct (at the time of work)	Condition management Check sheet	worker		19.25g or more	
	9	Molding side coating amount ② Target value ± 0.75 g Weighing scale (0.1g)	1 / Direct (at the time of work)	Condition management Check sheet	worker		1.25g or more	
	Ten	Twist side coating amount ① Target value ± 0.75g Weighing scale (0.1g)	1 / Direct (at the time of work)	Condition management Check sheet	worker		20.25g or more	
	11 11	Twist side coating amount ② Target value ± 0.75g Weighing scale (0.1g)	1 / Direct (at the time of work)	Condition management Check sheet	worker		12.25g or more	
	12	Unistank temperature 25 ± 15 ℃ This machine (1 ℃)	1 / Direct (at the time of work)	Condition management Check sheet	worker			
	13	Varnish mixing ratio 100: 1.4-1.5 Weighing scale (0.1g)	At the time of setup	Recording paper	Team leader			
	14	OK Master Check This machine (0.1g)	1 / Direct (at the time of work)	Check sheet	worker		1st and 2st weighing scale master	
	15	OK master value confirmation Offline (0.1g)	1 / Y	Recording paper	Team leader			
C	16 16	Coil fixing force 10.2N / piece or more Push-pull gage (0.01N)	1 / W	Submission inspection x-Rs control chart	Partial inspection Team leader			
C	17 17	Powder film thickness 0.08 mm or more Cross-section inspection ⇒ Tool microscope (0.001 mm)	1 / W	Submission inspection x-Rs control chart	Partial inspection Team leader			
◎	17 17	Powder front work temperature 175 ± 35 ℃ This machine (0.1 ℃) * Radiation thermometer	100% 4 / Nao	Equipment automatic check xR control chart	worker Team leader			
◎	18 18	Number of powder immersions 4 ± 1 times This machine (times)	100%	Equipment automatic check	worker			
◎	19 19	Powder immersion time 0.4 ± 0.1s This machine (0.1s)	100%	Equipment automatic check	worker			
◎	20	Work temperature before impregnation application 135 ± 15 ℃ This machine (0.1 ℃) * Radiation thermometer	100% 4 / Nao	Equipment automatic check xR control chart	worker Team leader			
◎	twenty one	Impregnation coating amount 48g or more This machine (0.1g) * Weighing scale	4 / Nao	xR control chart	Team leader			
◎	twenty two	Coating position Molding side ① R81.7 ± 0.25mm This machine (0.01 mm)	100% 4 / Nao	Equipment automatic check xR control chart	worker Team leader			
◎	twenty three	Coating position Molding side ② R74.7 ± 0.25mm This machine (0.01 mm)	100% 4 / Nao	Equipment automatic check xR control chart	worker Team leader			
◎	twenty four	Application position Twist side ① R90 ± 0.25mm This machine (0.01 mm)	100% 4 / Nao	Equipment automatic check xR control chart	worker Team leader			
◎	twenty five	Application position Twist side ② R84 ± 0.25mm This machine (0.01 mm)	100% 4 / Nao	Equipment automatic check xR control chart	worker Team leader			
◎	26	Work speed during application Molding side ① 4.0 ± 0.3 rpm This machine (0.01 mm)	100% 4 / Nao	Equipment automatic check xR control chart	worker Team leader			
◎	27	Work speed during application Molding side ② 6.0 ± 0.3 rpm This machine (0.01 mm)	100% 4 / Nao	Equipment automatic check xR control chart	worker Team leader			
◎	28 28	Work speed during application Twist side ① 4.0 ± 0.3 rpm This machine (0.01 mm)	100% 4 / Nao	Equipment automatic check xR control chart	worker Team leader			
◎	29	Work speed during application Twist side ② 4.0 ± 0.3 rpm This machine (0.01 mm)	100% 4 / Nao	Equipment automatic check xR control chart	worker Team leader			
◎	30	Impregnation discharge rotation speed 18.3 rotations on the molding side and 36.2 rotations on the twist side This machine (0.1 rotation)	100% 4 / Nao	Equipment automatic check xR control chart	worker Team leader		Impregnation coating amount 16g on the molding side, 32g or more on the twist side Guaranteed disk speed with substitute characteristics	
◎	31	Appearance Abnormal	2 / Direct + When changing processing conditions	Check	worker		* Refer to the limit sample	

No.	Revision Date	Revision item	Reason for revision	Revised person
△3	1/23/2017	Cleaning the output line clamp	Reflects the examination results during the initial flow	Kosaka
△2	20161010	Change of control value of heating current value	Clerical corrections	Mountains
△1	20160810	Change the control value of varnish coating amount	Added as a countermeasure for problems during initial flow	Mountains

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Parties outside the secret

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Structure system diagram	Issuing section: Electric manufacturing department 2 production engineering room 4 / date of creation: 2/8/2016	Approval: 吉 6/02/08 田	examination: 小 6/02/08 坂	examination: 山 6/02/08 地			Distribution cloth Ahead					

Line name	Assembly part number, part name	name / Priority management designation
690A MG Stereoline	212100-0080 Stater S / A, Mo Tar	For initial flow S 13 C 1 C 2 17.17
System No. Systematic name <1/1> 12 Heated powder impregnation	Model Product Name 212101-0080 ASSY DRAWING, statuser	Delivery destination, reserved vehicle type Toyota 690A

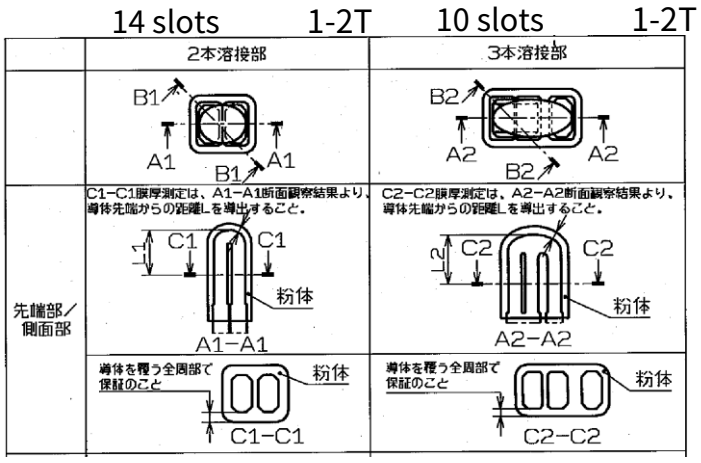
● Measurement site and frequency

Measurement site	pre-process	Unit	interval	Rotation number
10 slots Vertical ⇒ Horizontal ⇒ Diagonal 14 slots Vertical ⇒ Horizontal ⇒ Diagonal	No. 1 Line	1st	1 / W	①
10 slots Vertical ⇒ Horizontal ⇒ Diagonal 14 slots Vertical ⇒ Horizontal ⇒ Diagonal	No. 2 Line	1st	1 / W	②
10 slots Vertical ⇒ Horizontal ⇒ Diagonal 14 slots Vertical ⇒ Horizontal ⇒ Diagonal	No. 1 Line	2st	1 / W	③
10 slots Vertical ⇒ Horizontal ⇒ Diagonal 14 slots Vertical ⇒ Horizontal ⇒ Diagonal	No. 2 Line	2st	1 / W	④

● Evaluation items

Powder film thickness 0.08μ or more

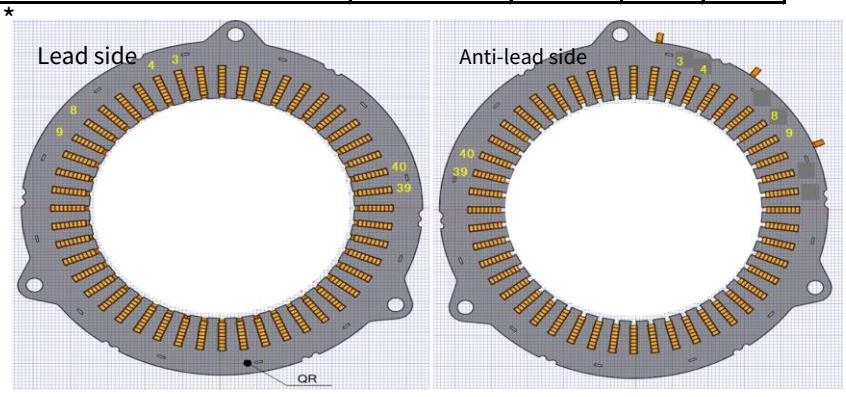
14 slots 1-2T 10 slots 1-2T



● Measurement site and frequency

Measurement site	pre-process	Unit	interval	Rotation number
3 slots 1-8T 4 slots 1-8T 8 slots 1-8T 9 slots 1-8T 39 slots 1-8T 40 slots 1-8T	No. 1 Line	1st	1 / W	①
3 slots 1-8T 4 slots 1-8T 8 slots 1-8T 9 slots 1-8T 39 slots 1-8T 40 slots 1-8T	No. 2 Line	1st	1 / W	②
3 slots 1-8T 4 slots 1-8T 8 slots 1-8T 9 slots 1-8T 39 slots 1-8T 40 slots 1-8T	No. 1 Line	2st	1 / W	③
3 slots 1-8T 4 slots 1-8T 8 slots 1-8T 9 slots 1-8T 39 slots 1-8T 40 slots 1-8T	No. 2 Line	2st	1 / W	④

*



● Evaluation items

△1 Adhesion force 10.2N or more [Control value 80N or more]

However, if the 8 layers (shift part) on the anti-lead side have no fixing force,

Evaluate according to the attached sheet "Coil end measurement method when the varnish adhesion force of the 8th layer of anti-lead is 10.2N not reached", and the coil end adhesion force can be used as a substitute.

ワニス固定力測定

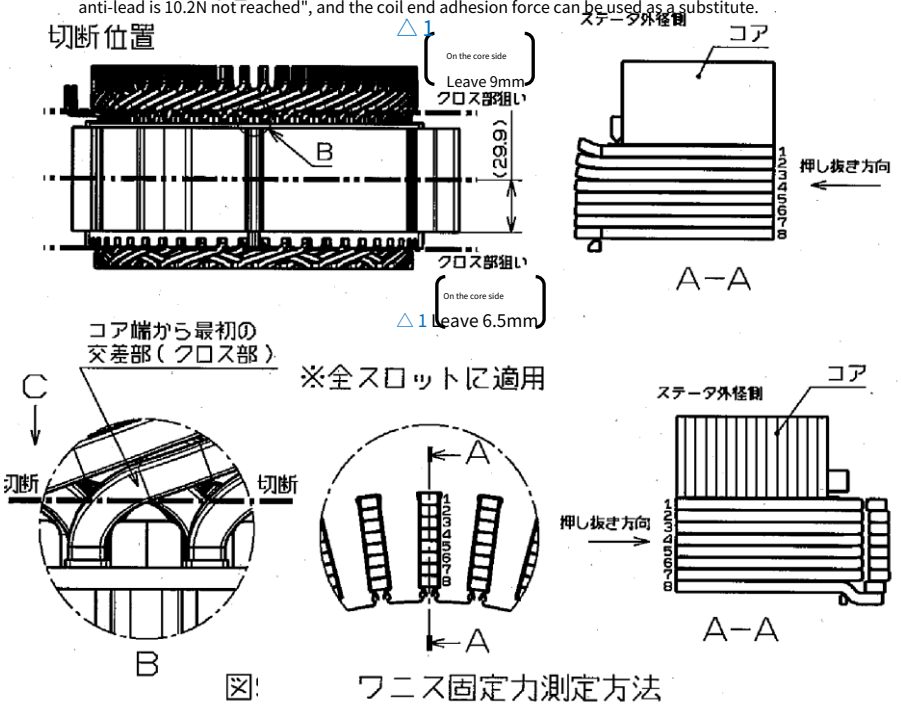


図 ワニス固定力測定方法

No.	Revision Date	Revision item	Reason for revision	Revised person
△3	1/23/2017	Cleaning the output line clamp	Reflects the examination results during the initial flow	Kosaka
△2	2016.11.25	Change of rotation number of submitted inspection due to Noh increase	Increased front-end process	Mountains
△1	2016.4.1	Unplugged load cut position, remedy added	Missing description	Mountains

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