



# PROCESS CONTROL PLAN

## WIRE BONDING SMART CARD



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Production Training

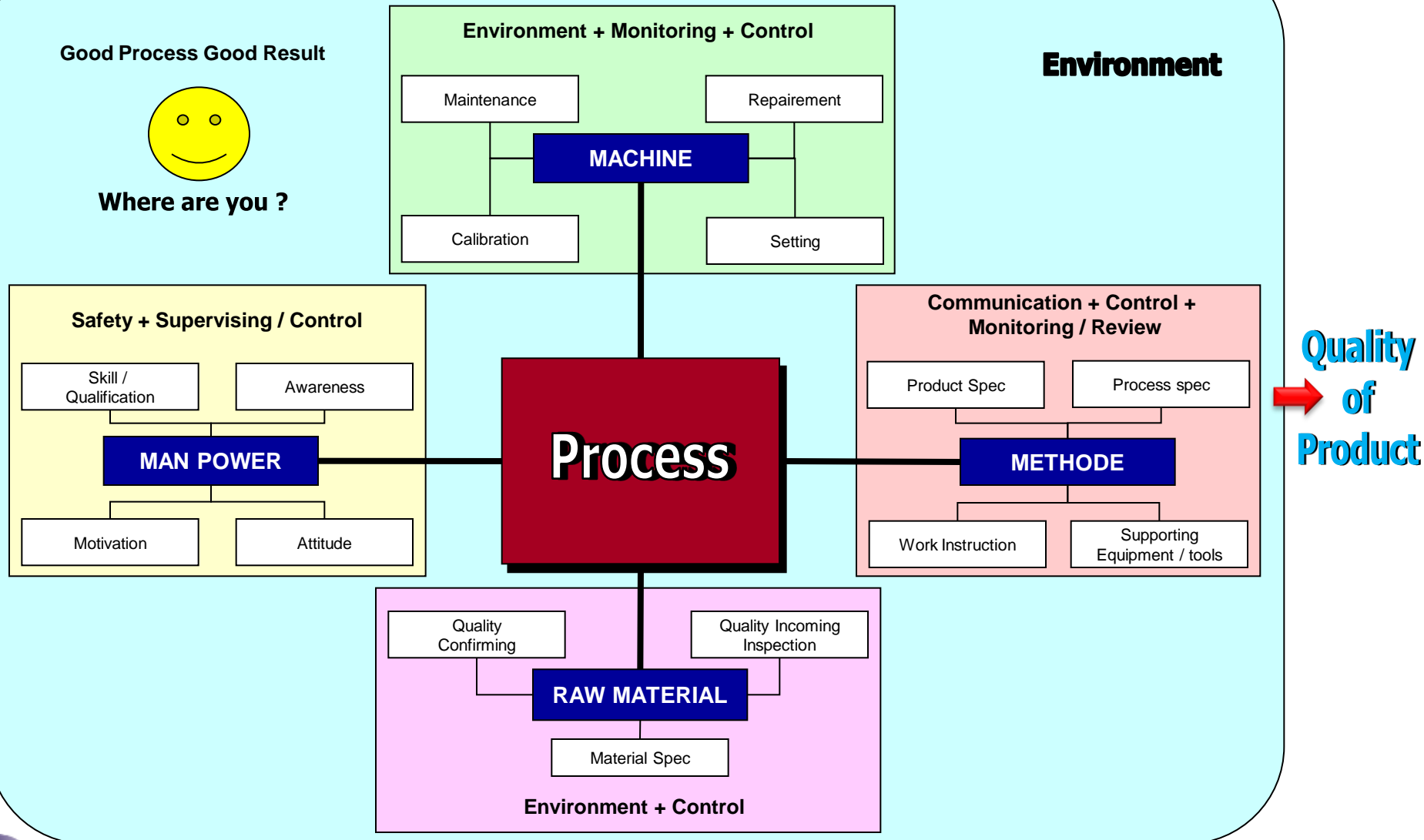
# Good Process + Good Attitude → Good Quality + Good Output

Where is your place for contribution to make a Good Quality ??

Good Process Good Result



Where are you ?



# PENGERTIAN

- ❑ Proses Control Plan adalah Sistem pengontrolan pada suatu proses yang dilakukan oleh proses Control, Operator dan
- ❑ Leader atau Supervisor.
- ❑ Manufacturing specification adalah Batasan atau spesifikasi suatu produk yang diperbolehkan dari hasil suatu proses.

Proses Condition Table adalah Batasan atau spesifikasi kondisi mesin yang diperbolehkan pada saat proses .

# PROCESS CONTROL PLAN

Characteristics			Special Char. Class	Product/ Process Specification/Tolerance	Methods Evaluation/ Measurement Technique	Sample		Pic
N0	Product	Process				Size	Freq	
1	Wire Loop Height		*	Loop Height 1 Spec < 85 $\mu$ m Loop Height 2 Spec > 40 $\mu$ m <b>(Contact Type)</b> Loop Height 1 Spec < 60 $\mu$ m Loop Height 2 Spec > 40 $\mu$ m <b>(Contactless)</b>	Measurement Microscope	6 wires from 2 pcs/lot	Every starting new lot / after conversion set up	PC
2	Wire Pull Strength Test		*	$\geq 6.5$ gF <b>(Contact Type)</b> $\geq 2.8$ gF <b>(Contactless)</b>	Wire Pull tester	6 wires from 2 pcs/lot	Every starting new lot / after conversion set up	PC
3	Ball Shear Strength Test		*	Wire dia 25um $\geq 28$ gF Wire dia 18um $\geq 23$ gF	Ball Shear tester	6 wires from 2 pcs/lot	Every starting new lot / after conversion set up	PC
4	Wire Bond Appearance			Refer to Smartcard Reject Criteria for WB (Doc. No. PO8Hb8-001) Acc = 0 Rej = 1	Microscope	20 pcs/lot top and bottom side	Every starting new lot / after conversion set up	Operator
5		Bond Heater Temperature		165 $\pm$ 15 $^{\circ}$ C <b>(Contact Type)</b> 150 $\pm$ 15 $^{\circ}$ C <b>(Contactless)</b> 165 $\pm$ 15 $^{\circ}$ C <b>(Contact Type)</b> 150 $\pm$ 15 $^{\circ}$ C <b>(Contactless)</b>	Machine Display	2 points /machine	Every Lot (MC Display)	Operator
6		Wire Bond Parameter Setting		According to Wire Bond Parameter table	Machine Display	all machine	1x / shift or after conversion set up.	Operator
7		Downholder Cleanliness		No dirty and No remained foreign material	Naked eyes	all machine	Every starting new lot / after conversion set up	Operator
8		Capillary Limit counter		300K	Machine Display	all machine	1x / shift or after capillary changing	Operator
9		Leadframe tape to Reel Alignment	*	Align and straight	Naked eyes	all machine	Every starting new lot / after conversion set up	Operator

# PROCESS CONTROL PLAN

## WIRE BONDING

















### 1.WIRE BOND APPEARANCE

Adalah kondisi material setelah proses Wire bonding,Dokumen yang digunakan sebagai panduan adalah berdasarkan dengan dokumen kriteria reject smartcard.

#### A.Control Plan

Characteristics			Special Char. Class	Methods				Pic
NO	Product	Process		Product/ Process Specification/Tolerance	Evaluation/ Measurement Technique	Sample		
						Size	Freq	
4	Wire Bond Appearance			Refer to Smartcard Reject Criteria for WB (Doc. No. PO8Hb8-001) Acc =0      Rej = 1	Microscope	20 pcs/lot top and bottom side	Every starting new lot / after conversion set up	Operator

#### B.Reject Kriteria di Wire Bond

 <b>PT. UTAC Manufacturing Services Indonesia</b>		<b>Title:</b> UID- Smartcard Reject Criteria <b>Doc. Number (ID):</b> PO8Hb8-001 <b>Revision:</b> 01		Page: 8 of 17
<b>Revisi</b> Revisi 01 Revisi 02 Revisi 03	<b>Revisi</b> Revisi 01 Revisi 02 Revisi 03	  	<b>Revisi</b> Revisi 01 Revisi 02 Revisi 03	<b>Revisi</b> Revisi 01 Revisi 02 Revisi 03
<b>4.3 WIRE BOND REJECT CRITERIA</b>				
Defect Name	Description	Defect Picture / Troubleshooting	Defect and Picture	REMARK
Wire Short	Any wire touches other wire			Any wire short is not allowed
Wire Bridge	Wire is bridge across two pads or surface			Any wire bridge is not allowed
Double Bonding	Bonding process more than 1x in the same pad position			Any double wire is not allowed
Defect pad bond	Pad bond area not clear, maximum 10% of pad			Reject if any defect pad bond is more than 10% of pad area
Bad connection	Bad wiring from the wire and component			Any wiring bad from wire and not allowed
Wire 17 length	Wire bonding into the pad area, the bonding area is not clear			Any wiring length into the pad area is not allowed



Sample check :  
20 pcs/lot bagian atas dan bawah

Frekuensi :  
Setiap awal Lot baru / after Set up

Pic :  
operator

# PROCESS CONTROL PLAN

## WIRE BONDING

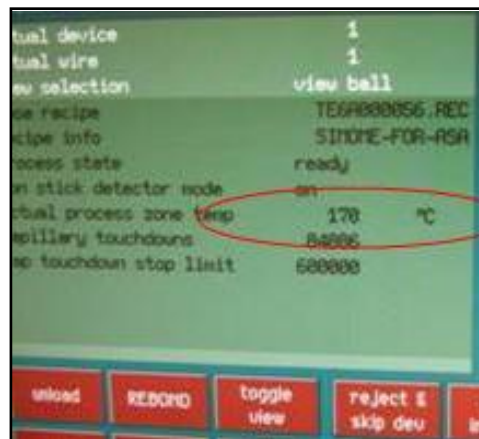
### 2.BOND HEATER TEMPERATURE

Pada proses Wire Bonding ,Cure temperatur digunakan untuk membantu proses pembondingan Wire Dari Bondpad Chip ke Lead Leadframe.

#### A.Control Plan

Characteristics			Special Char. Class	Product/ Process Specification/Tolerance	Methods Evaluation/ Measurement Technique	Sample		Pic
N0	Product	Process				Size	Freq	
5		Bond Heater Temperature		165±15°C (Contact Type) 150±15°C (Contactless)	Machine Display	2 points /machine	Every Lot (MC Display)	Operator
				165±15°C (Contact Type) 150±15°C (Contactless)	Surface Thermometer	2 points /machine	1 x/ week or start up	PC

#### B.Cure & Display



Sample check :  
2 point / mesin

Frekuensi :  
Setiap awal Lot baru ( display mesin )

Pic :  
operator



# PROCESS CONTROL PLAN

## WIRE BONDING

### 3.WIRE BOND PARAMETER SETTING

Pada proses Wire Bonding ,Operator mencatat Parameter wire bond yang ada di Display monitor mesin WB

#### A.Control Plan

Characteristics			Special Char. Class	Methods				Pic
NO	Product	Process		Product/ Process Specification/Tolerance	Evaluation/ Measurement Technique	Sample		
						Size	Freq	
6		Wire Bond Parameter Setting		According to Wire Bond Parameter table	Machine Display	all machine	1x / shift or after conversion set up.	Operator

#### B.Parameter Display & Standar

*Sample check :*  
*Setiap mesin Wire Bond*

*Frekuensi :*  
*1 x per shift / after Convert Setup*  
*(display mesin)*

*Pic :*  
*operator*

# PROCESS CONTROL PLAN

## WIRE BONDING

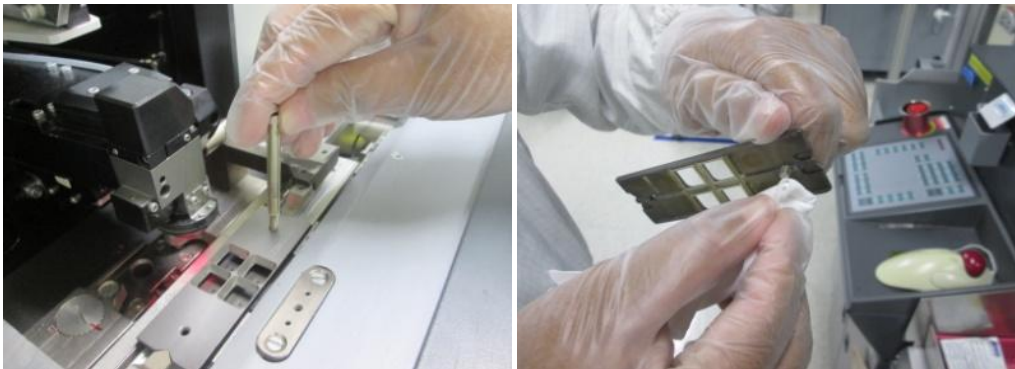
### 4.DOWNHOLDER CLEANLINESS

Proses pembersihan area downholder mesin wire bond sebelum proses lot baru

#### A.Control Plan

Characteristics			Special Char. Class	Methods				Pic
NO	Product	Process		Product/ Process Specification/Tolerance	Evaluation/ Measurement Technique	Sample		
						Size	Freq	
7		Downholder Cleanliness		No dirty and No remained foreign material	Naked eyes	all machine	Every starting new lot / after conversion set up	Operator

#### B.Downholder clean



*Sample check :  
Setiap mesin Wire Bond*

*Frekuensi :  
Setiap awal Lot Baru / setelah Convert  
Set up  
Pic :  
operator*



# PROCESS CONTROL PLAN

## WIRE BONDING

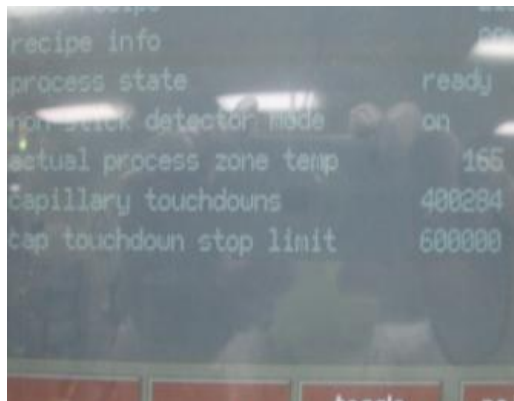
### 5.CAPPILARY LIMIT COUNTER

Pada proses Wire Bonding,Cappilary memiliki batasan proses bonding sebesar 600K bonding wire.

#### A.Control Plan

Characteristics			Special Char. Class	Methods				Pic
N0	Product	Process		Product/ Process Specification/Tolerance	Evaluation/ Measurement Technique	Sample		
						Size	Freq	
8		Capillary Limit counter		300K	Machine Display	all machine	1x / shift or after capillary changing	Operator

#### B.Downholder clean



*Sample check :*  
*Setiap mesin Wire Bond*

*Frekuensi :*  
*1 x per shift / setelah pergantian capillary*  
*Pic :*  
*operator*

# PROCESS CONTROL PLAN

## WIRE BONDING

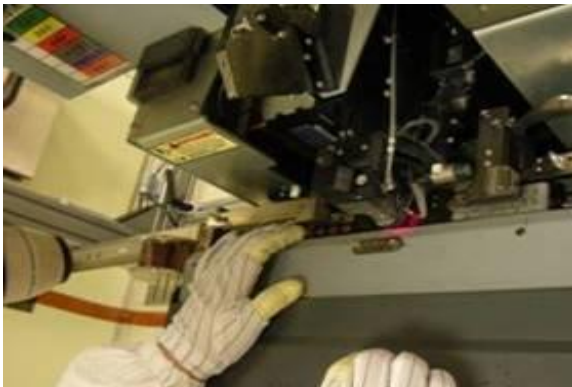
### 6. Leadframe tape Alignment

Pada proses Wire Bonding, Orientasi Leadframe sangat penting sebelum proses dimulai.

#### A. Control Plan

Characteristics			Special Char. Class	Methods				Pic
N0	Product	Process		Product/ Process Specification/Tolerance	Evaluation/ Measurement Technique	Sample		
						Size	Freq	
9		Leadframe tape to Reel Alignment	*	Align and straight	Naked eyes	all machine	Every starting new lot / after conversion set up	Operator

#### B. Alignment Leadframe



*Sample check :  
Setiap Material di mesin Wire Bond*

*Frekuensi :  
Setiap awal lot baru dan After Convert set up*

*Pic :  
operator*