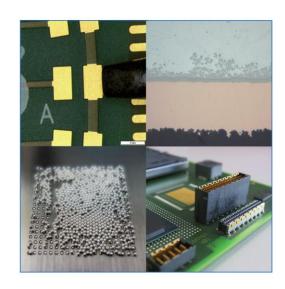




eitfader

Rework elektronischer Baugruppen

Qualifizierbare Prozesse für die Nacharbeit



Zentralverband Elektrotechnik- und Elektronikindustrie

Ergebnisse Reworkversuche

Arbeitsablauf



Teilnehmer:

Cassidian

H. Thomas Lauer

Zollner Elektronik AG

- H. Groitl Christian (Rework)
- H. Michael Zimmerer (Doku)
- H. Stefan Penzenstadler (Rework)

Rohde und Schwarz

H. Cyrus (Rework QFN)

Reinigen



Arbeitsablauf

- Für FCI und ERNI Stecker aktuell keine Düsen

Bauteil xx/ auf Board Seriennummer

- 1. X-Ray Status Poren/ Voiding Overview im Initialzustand
- 2. Durchführung des Rework Zevac Onyx29 mit Profilen
- 3. Baustein abnehmen (Foto nach Abnahme), Focus auf verlorene Pads
- 4. Restlotentfernung (automatisch, manuell geübt, manuell ungeübt) exemplarisches Video jedes Arbeitsganges 1x je Bauteil
- 5. Flussmittel applizieren Bauteil auflöten- X-Ray Reworkzustand Focus auf Voiding



Variationen

Zum Entlöten wird Flussmittel verwendet

- → Thermischer Ausgleich
- → Restlotdepot ist bei größeren Pitches nutzbar

- Plugging Varianten beachten

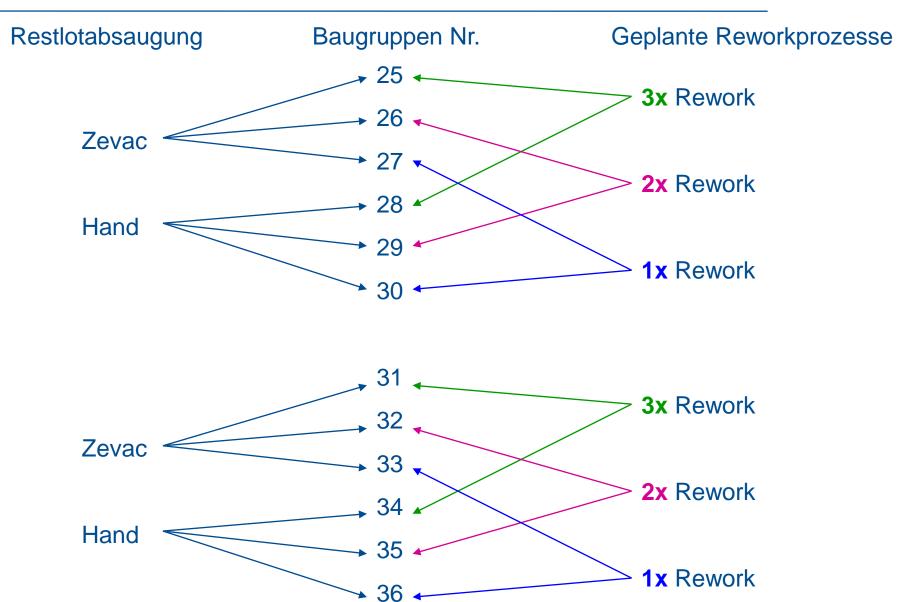
- Rückstellmuster zur Variationsbeurteilung zurückhalten



Rework:

- 1. Baustein BGA 256 Daisy Chain Messung
- 2. 3x Rework mit neuen Baustein
- 3. später Reballing





Ergebnisse



BGA256		CONN_FCI_743 90		
ZAL R-PBGA-N176 (mit Massefläche)	EA328281 942E5361	CONN_ERNI_1 14713		
ZAL R-PBGA-N176 (ohne Massefläche)	EA328281 942EE3961	PN S-PQFP- G80	&₩5AC64FT@4 M43OFG439	
PZP-S-PQFP-G100	& 95A9KQJ TLC59Q2	RCE S-PQFP- G64	₩ 08 2001 NIPDAU PM MECH S	
PZ-S-PQFP-G100	© 88CXRVT <u>c4</u> W-305-47197	TAC		
BGA Sockel		BEAD PROBES		

Versuchsplan BGA256



Test- board	Ver- fahren	X-Ray	Rework 1 (Absaugung)	DC	X-Ray 1	Rework 2 (Absaugung)	DC	X-Ray 2	Rework 3 (Absaugung)	DC	X-Ray 3
25		i	ja (Zevac)	ok	i	ja (Zevac)	ok	i	ja (Zevac)	ok	i
26		Ü	ja (Zevac)	ok	Ó	ja (Zevac)	ok	i			
27		i	ja (Zevac)	ok	f						
28		i	ja (Hand)	ok	(i)	ja (Hand)	ok	Ü	ja (Hand)	ok	(i)
29	Zevac	Ü	ja (Hand)	ok	Û	ja (Hand)	ok	i			
30	ac -	Ü	ja (Hand)	ok	(i)						
31	Rev	i	ja (Zevac)	ok	f	ja (Zevac)	ok	i	ja (Zevac)	ok	i
32	Rework	i	ja (Zevac)	ok	1	ja (Zevac)	ok	i			
33		i	ja (Zevac)	ok	f						
34		i	ja (Hand)	ok	f i	ja (Hand)	ok	i	ja (Hand)	ok	fi
35		Ú	ja (Hand)	ok	Û	ja (Hand)	ok	i			1
36		Ú	ja (Hand)	ok	d						

Versuchsplan Sockel



Test- board	Ver-fahren	X-Ray	Rework 1 (Absaugung)	Methode	X-Ray 1
25		1	ja (Zevac)	mit Flussmittel	Ó
26	Zevac	1	ja (Zevac)	mit Flussmittel	Ú
27	ac -	1	ja (Zevac)	mit Dip-Paste	Ú
28	Rev	i	ja (Hand)	mit Flussmittel	Ü
29	Rework	i	ja (Hand)	mit Dip-Paste	i
30		i	ja (Hand)	mit Dip-Paste	Û



Versuchsplan ZAL R-PBGA-N176 (mit Massefläche)



Test- board	Ver- fahren	X-Ray	Rework 1 (Absaugung)	X-Ray 1	Rework 2 (Absaugung)	X-Ray 2	Rework 3 (Absaugung)	X-Ray 3
25		Ó	ja (Zevac)	i	ja (Zevac)	i	ja (Zevac)	Ü
26		i	ja (Zevac)	Û	ja (Zevac)	i		
27		i	ja (Zevac)	Û				
28		i	ja (Hand)	Ú	ja (Hand)	Ü	ja (Hand)	Ó
29	Zevac	i	ja (Hand)	Û	ja (Hand)	i		
30	ac -	Ü	ja (Hand)	Û				
31	Rev	Ú	ja (Zevac)	i	ja (Zevac)	Ó	ja (Zevac)	Ó
32	Rework	i	ja (Zevac)	i	ja (Zevac)	i		
33		Ü	ja (Zevac)	i				
34		i	abgelötet					
35		i	abgelötet					
36		Ó	abgelötet					

Versuchsplan ZAL R-PBGA-N176 (ohne Massefläche)



Test- board	Ver- fahren	X-Ray	Rework 1 (Absaugung)	X-Ray 1	Rework 2 (Absaugung)	X-Ray 2	Rework 3 (Absaugung)	X-Ray 3
25		i	ja (Zevac)	ð	ja (Zevac)	i	ja (Zevac)	i
26		Ü	ja (Zevac)	i	ja (Zevac)	Ü		
27		i	ja (Zevac)	Ü				
28		Ú	ja (Hand)	Û	ja (Hand)	Ú	ja (Hand)	(1)
29	Zevac	Ú	ja (Hand)	Ü	ja (Hand) 🕦	Ó		
30	ac -	6	ja (Hand)	i				
31	Rev	i	ja (Zevac)	i	ja (Zevac)	Û	ja (Zevac)	Ü
32	Rework	Ó	ja (Zevac)	i	ja (Zevac)	Ú		
33		Ó	ja (Zevac)	i				
34		i	abgelötet					
35		i	abgelötet					• •
36		i	abgelötet					

Versuchsplan PZP-S-PQFP-G100



Test- board	Ver- fahren	X-Ray	Rework 1 (Absaugung)	X-Ray 1	Rework 2 (Absaugung)	X-Ray 2	Rework 3 (Absaugung)	X-Ray 3
25		Ü	ja (Hand)	i	ja (Hand)	Ü	ja (Hand)	i
26		Ú	ja (Hand)	Ü	ja (Hand)	Ú		
27		i	ja (Hand)	Ú				
28		Ó	ja (Hand)	Ú	ja (Hand)	Ó	ja (Hand)	i
29	Hand	Ú	ja (Hand)	Ü	ja (Hand)	Ú		
30	l D	Ó	ja (Hand)	Ü				
31	Rev	i	ja (Hand)	Ü	ja (Hand)	(i)	ja (Hand)	Ú
32	Rework	Ó	ja (Hand)	Ú	ja (Hand)	Ó		
33		Ó	ja (Hand)	Ú				
34		fi	ja (Hand)	Ú	ja (Hand)	i	ja (Hand)	i
35		i	ja (Hand)	Ú	ja (Hand)	Ó		1
36		(i)	ja (Hand)	Ü				

Versuchsplan PZ-S-PQFP-G100



Test- board	Ver- fahren	X-Ray	Rework 1 (Absaugung)	X-Ray 1	Rework 2 (Absaugung)	X-Ray 2	Rework 3 (Absaugung)	X-Ray 3
25		i	ja (Hand)	1	ja (Hand)	i	ja (Hand)	i
26		Ü	ja (Hand)	Ü	ja (Hand)	Ů		
27		Ü	ja (Hand)	i				
28		Ú	ja (Hand)	Ü	ja (Hand)	Ú	ja (Hand)	Ú
29	Hand	Ú	ja (Hand)	Ú	ja (Hand)	Ú		
30	- PL	Ü	ja (Hand)	Ú				
31	Rev	Ü	ja (Hand)	Ú	ja (Hand)	Ú	ja (Hand)	ð
32	Rework	Ü	ja (Hand)	Ú	ja (Hand)	Ü		
33		Ü	ja (Hand)	Ú				
34		i	ja (Hand)	Ü	ja (Hand)	ij	ja (Hand)	i
35		Ü	ja (Hand)	Ü	ja (Hand)	Ü		1
36		1	ja (Hand)	Û				

Versuchsplan CONN_FCI_74390



Test- board	Ver- fahren	X-Ray	Rework 1 (Absaugung)	X-Ray 1	Rework 2 (Absaugung)	X-Ray 2	Rework 3 (Absaugung)	X-Ray 3
25			ja (Zevac)	i	ja (Zevac)		ja (Zevac)	i
26			ja (Zevac)	Ó	ja (Zevac)	Û		
27			ja (Zevac)	Ú				
28	_		ja (Hand)	Û	ja (Zevac)		ja (Hand)	i
29	Zevac		ja (Hand)	fi	ja (Zevac)	i		
30	ac -		ja (Hand)	Û				
31	Re		ja (Zevac)	ð	ja (Zevac)		ja (Zevac)	i
32	Rework		ja (Zevac)	i	ja (Zevac)	Ú		
33			ja (Zevac)	Û				
34			ja (Hand)	Ú	ja (Zevac)		ja (Hand)	Ü
35			ja (Hand)	i	ja (Zevac)	i		• •
36			ja (Hand)	Ú				U

Versuchsplan CONN_ERNI_114713



Test- board	Ver- fahren	Rework 1 (Absaugung)	X-Ray 1	Rework 2 (Absaugung)	X-Ray 2	Rework 3 (Absaugung)	X-Ray 3									
25		keine (Restlot)		keine (Restlot)		keine (Restlot)	Ü									
26		keine (Restlot)		keine (Restlot)	i											
27		keine (Restlot)	Ü													
28		keine (Restlot)		keine (Restlot)		keine (Restlot)	i									
29	Zevac	keine (Restlot)		keine (Restlot)	i											
30	ac –	keine (Restlot)	Ü													
31	Re	keine (Restlot)		keine (Restlot)		keine (Restlot)	i									
32	work	work	work	work	work	work	work	Rework	work	work	keine (Restlot)		keine (Restlot)	t		
33		keine (Restlot)	Ú													
34		keine (Restlot)		keine (Restlot)		keine (Restlot)	Û									
35		keine (Restlot)		keine (Restlot)	i		• •									
36		keine (Restlot)	Ü				U									

Versuchsplan PN S-PQFP-G80



Test- board	Ver- fahren	Rework 1 (Absaugung)	Optisch	X-Ray 1	Rework 2 (Absaugung)	X-Ray 2	Rework 3 (Absaugung)	X-Ray 3
25	D N	ja (Zevac)	Û					
26	Zevac – Ablöten	ja (Zevac)	(i)					
27	n i	ja (Zevac)	Û					
28	カエ	ja (Hand)			ja (Hand)		ja (Hand)	Ú
29	Hand - Rework	ja (Hand)			ja (Hand)	Ú		
30	굿	ja (Hand)		O				
31	D N	ja (Zevac)	Û					
32	Zevac – Ablöten	ja (Zevac)	t					
33	βı	ja (Zevac)	Û					
34	カエ	ja (Hand)			ja (Hand)		ja (Hand)	O
35	Hand – Rework	ja (Hand)			ja (Hand)	Ú		•
36	굿	ja (Hand)		Ú				

Versuchsplan RCE S-PQFP-G64



Test- board	Ver- fahren	X-Ray	Rework 1 (Absaugung)	Optisch	X-Ray 1	Rework 2 (Absaugung)	X-Ray 2	Rework 3 (Absaugung)	X-Ray 3
25	A Z	i	ja (Zevac)	Û					
26	Zevac - Ablöten	Ó	ja (Zevac)	Ü					
27	ъ I	Û	ja (Zevac)	Ü					
28	カエ		ja (Hand)			ja (Hand)		ja (Hand)	t
29	Hand - Rework		ja (Hand)			ja (Hand)	i		
30	ᆽᅵ		ja (Hand)		Ú				
31	D N	i	ja (Zevac)	i					
32	Zevac - Ablöten	Ú	ja (Zevac)	Û					
33	n i	Ü	ja (Zevac)	Ü					
34	フェ フェ		ja (Hand)			ja (Hand)		ja (Hand)	Ú
35	Hand - Rework		ja (Hand)			ja (Hand)	i		*
36	· 구		ja (Hand)		Ü				

Versuchsplan TAC



Test- board	Ver- fahren	Leiterbahn- breite	Rework- zyklen	optische Inspektion				
		0,1	1					
		0,1	2	1				
		0,1	3				TAC	
		0,15	1			0402	0201	0.1mm 01005
		0,15	2	i				
	I I	0,15	3					Q.15mm
	Hand	0,2	1					
34	I 70	0,2	2	i		** ** **		0.2mm
	Rework	0,2	3		——			0.254mm
) F	0,254	1			** ** **		
		0,254	2	i				0.3mm
		0,254	3					
		0,3	1					
		0,3	2	i				
		0,3	3		/			

Versuchsplan BEAD PROBES



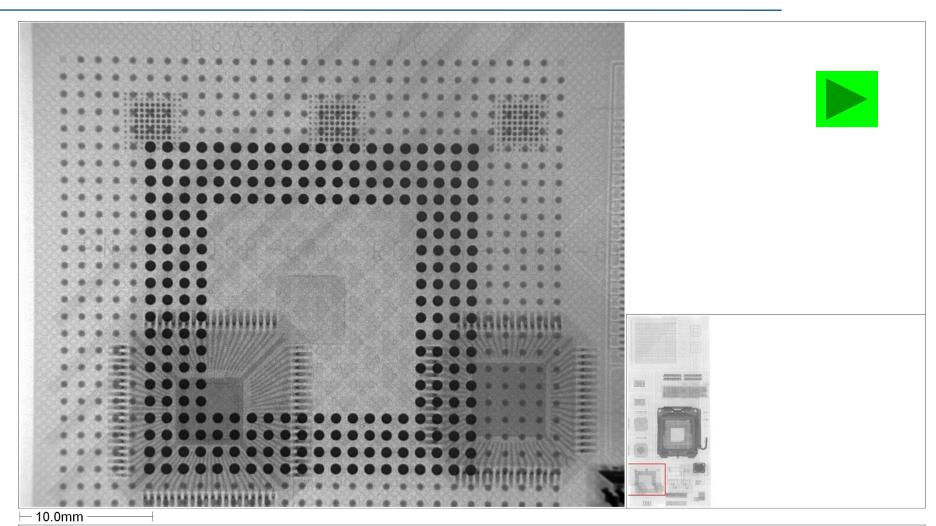
Test- board	Ver- fahren	Leiterbahn- breite	Temp. Belastungen	optische Inspektion	
34	Hand – Rework	0,1	1	i	
		0,1	2		
		0,1	3		
		0,15	1	i	O.1mm BEAD PROBES O.15mm O.2mm
		0,15	2		
		0,15	3		
		0,2	1	i	
		0,2	2		
		0,2	3		0.254mm
		0,254	1	Û	mmE.C
		0,254	2		
		0,254	3		
		0,3	1		
		0,3	2		
		0,3	3		



Baugruppe R+R 25 / Z

R+R 25 / Z - X-Ray vor Rework - BGA 256





Röhren Spannung: 120 kV Röhren Leistung: 2.19 W

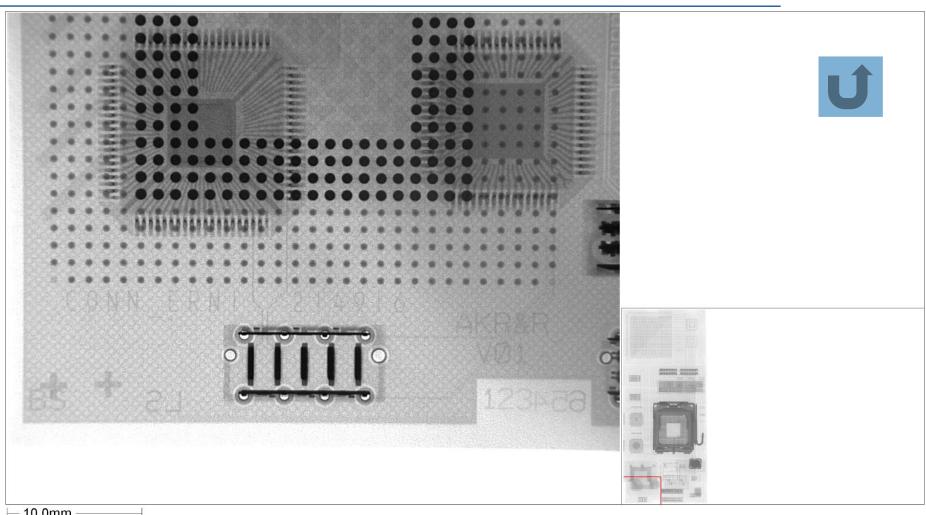
Filter in Verwendung: Medium-High Mag

/Filter Stärke: 80

Akkumulierung: 64 Frames

R+R 25 / Z - X-Ray vor Rework - BGA 256





- 10.0mm

Röhren Spannung: 120 kV Röhren Leistung: 2.19 W

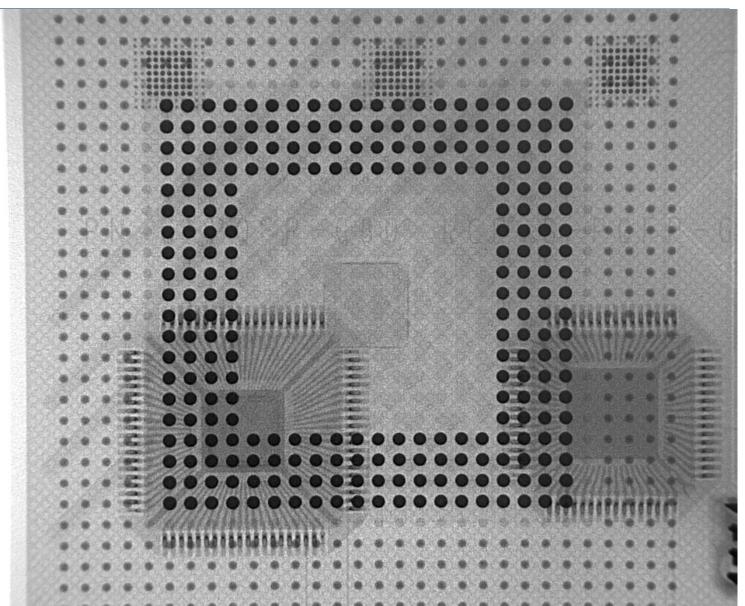
Filter in Verwendung: Medium-High Mag

Filter Stärke: 80

Akkumulierung: 64 Frames

R+R 25 / Z - X-Ray nach Rework 1 - BGA 256

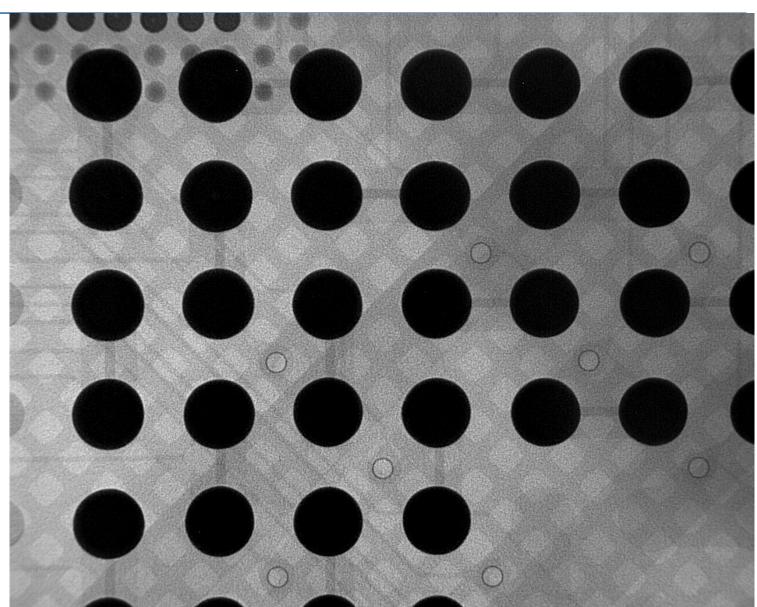






R+R 25 / Z - X-Ray nach Rework 1 / Detail - BGA 256



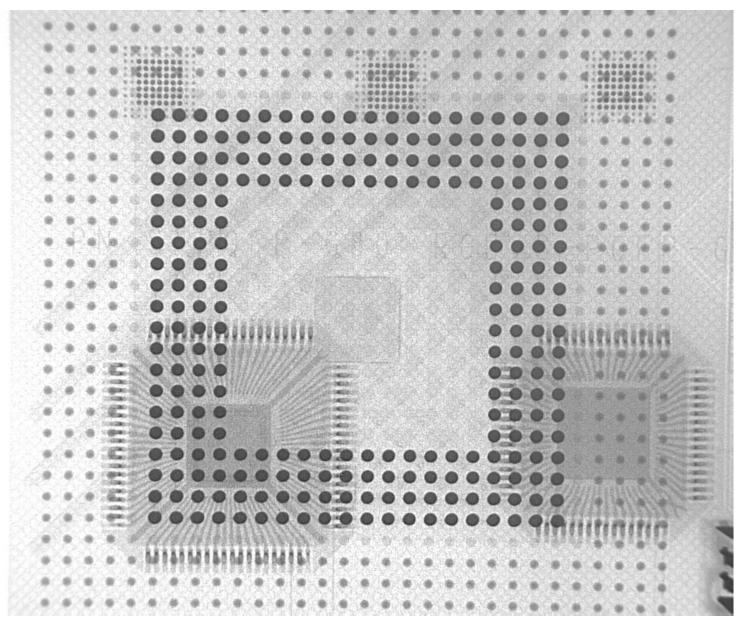




R+R 25 / Z - X-Ray nach Rework 2 - BGA 256



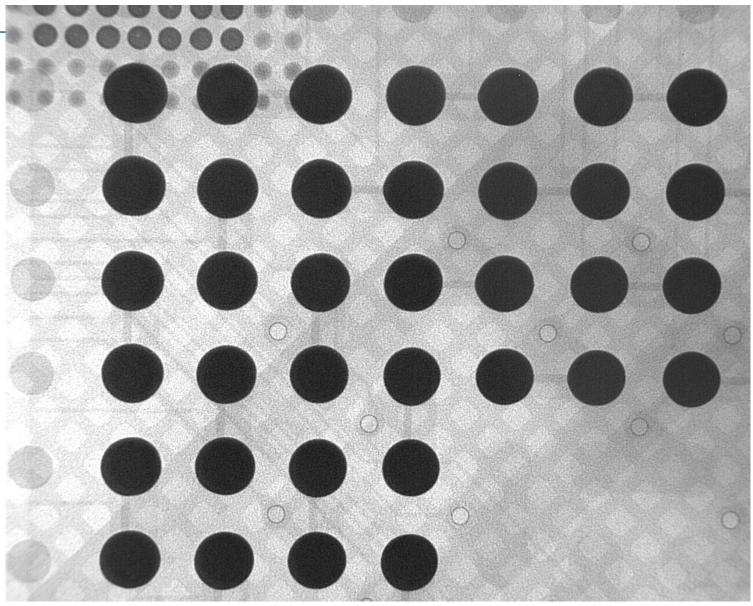




R+R 25 / Z - X-Ray nach Rework 2 / Detail - BGA 256



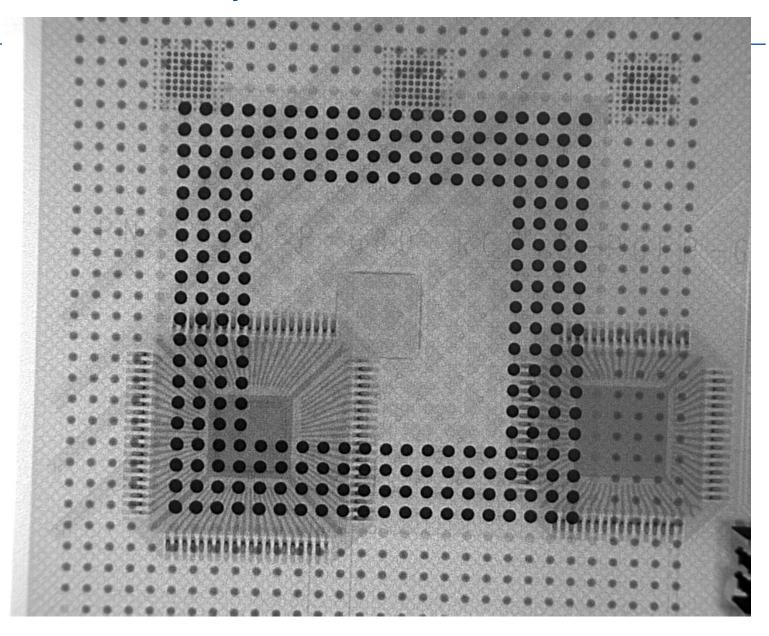




R+R 25 / Z - X-Ray nach Rework 3 - BGA 256



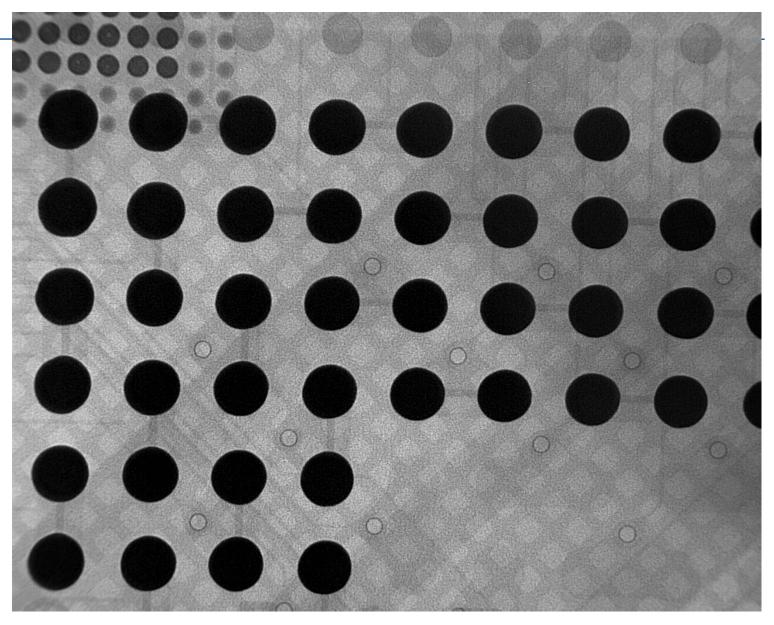




R+R 25 / Z - X-Ray nach Rework 3 / Detail - BGA 256

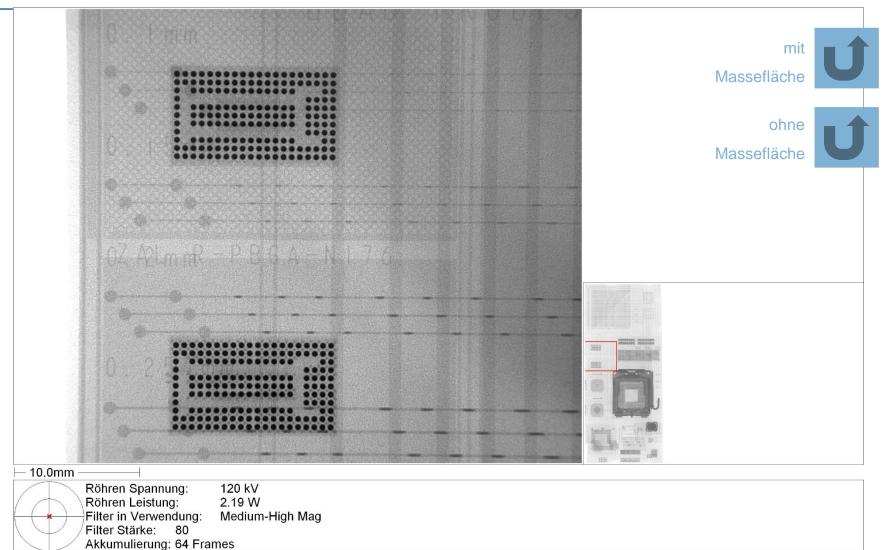






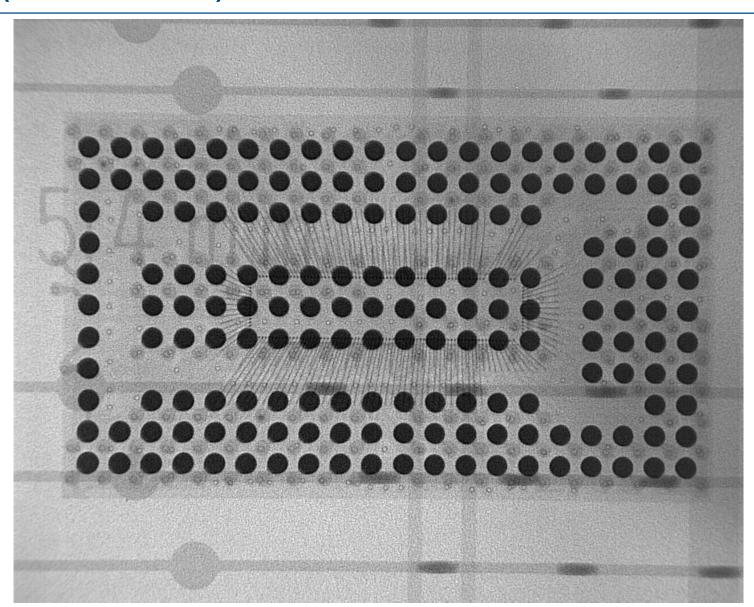
R+R 25 / Z - X-Ray vor Rework - ZAL R-PBGA-N176





R+R 25 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (mit Massefläche)

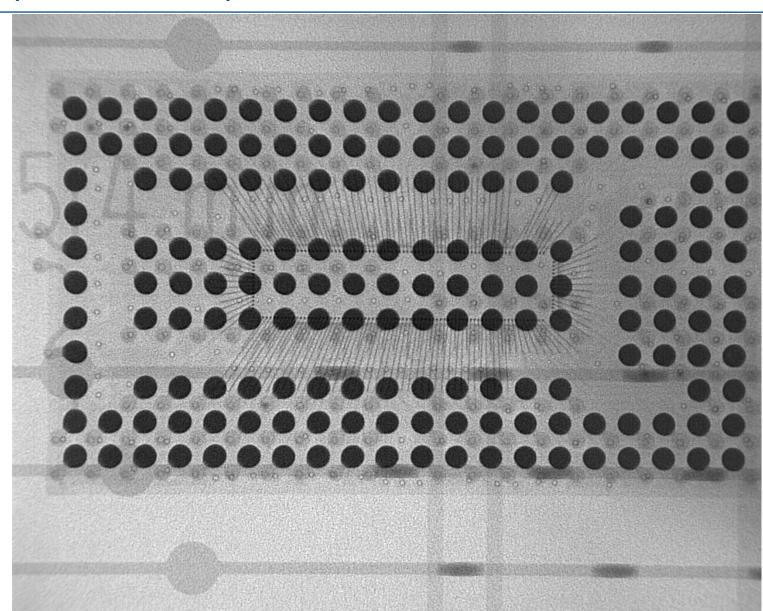






R+R 25 / Z – X-Ray nach Rework 2 – ZAL R-PBGA-N176 (mit Massefläche)

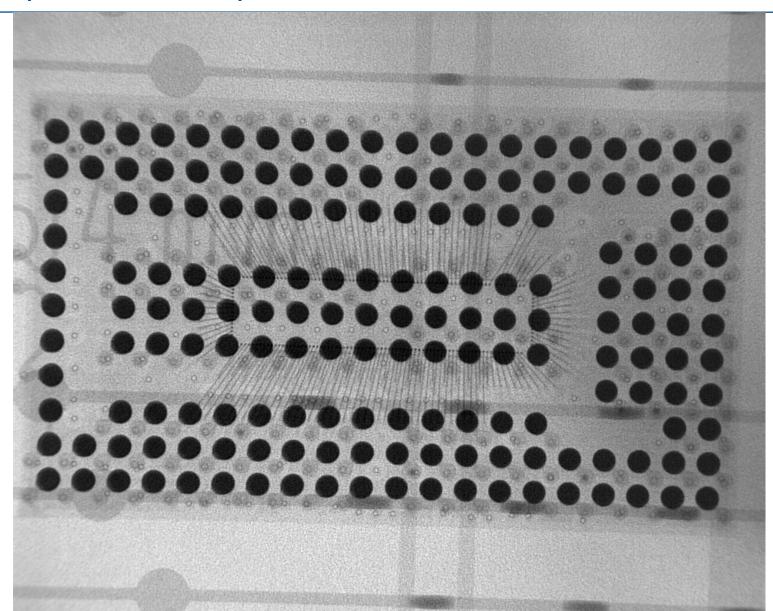






R+R 25 / Z – X-Ray nach Rework 3 – ZAL R-PBGA-N176 (mit Massefläche)

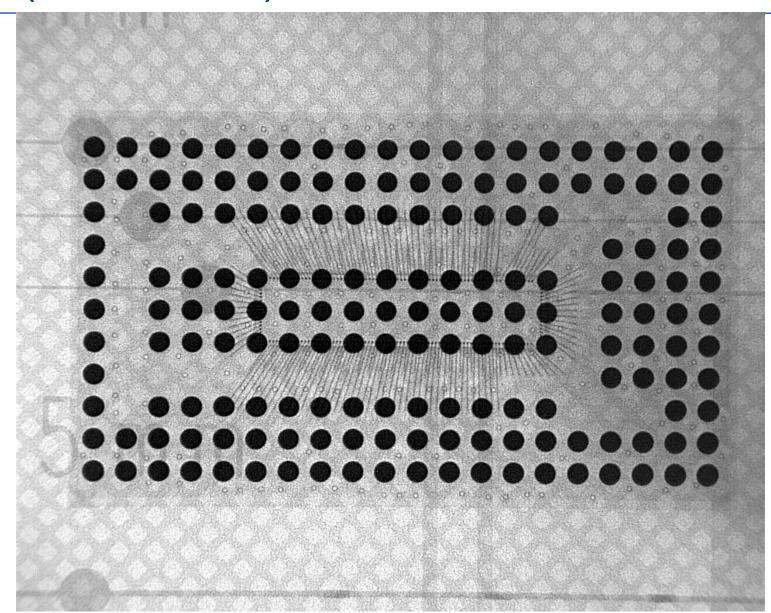






R+R 25 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (ohne Massefläche)

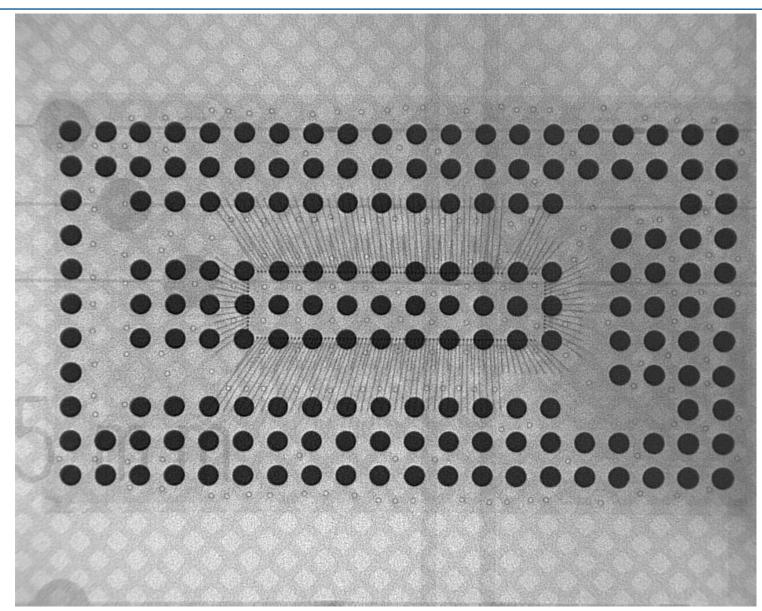






R+R 25 / Z – X-Ray nach Rework 2 – ZAL R-PBGA-N176 (ohne Massefläche)

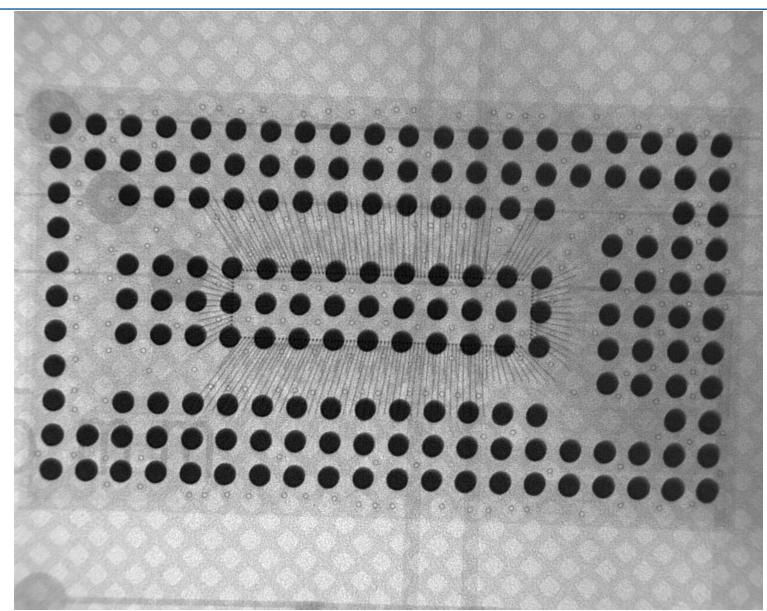






R+R 25 / Z – X-Ray nach Rework 3 – ZAL R-PBGA-N176 (ohne Massefläche)

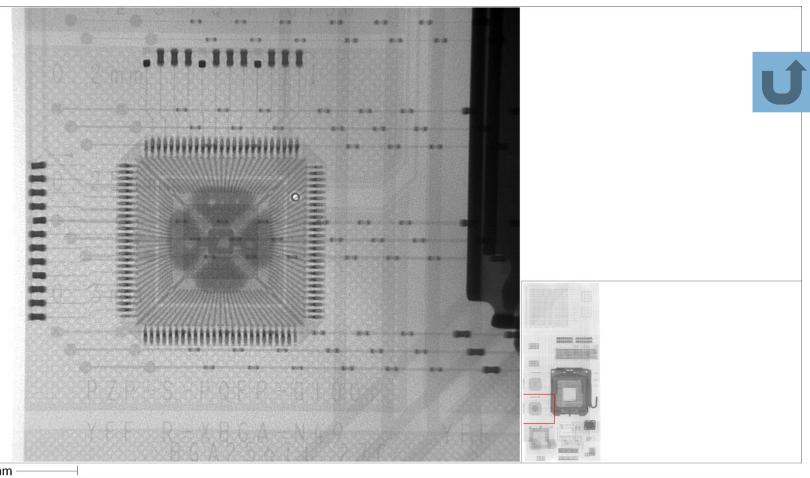






R+R 25 / Z - X-Ray vor Rework - PZP-S-PQFP-G100





10.0mm

Röhren Spannung: 120 kV Röhren Leistung: 2.19 W

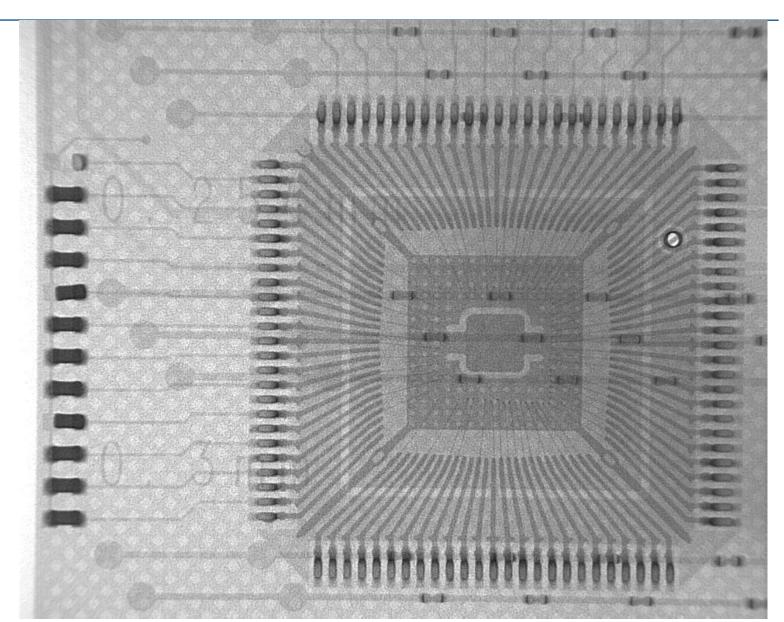
Filter in Verwendung: Medium-High Mag

Filter Stärke: 80

Akkumulierung: 64 Frames

R+R 25 / Z – X-Ray nach Rework 1 – PZP-S-PQFP-G100

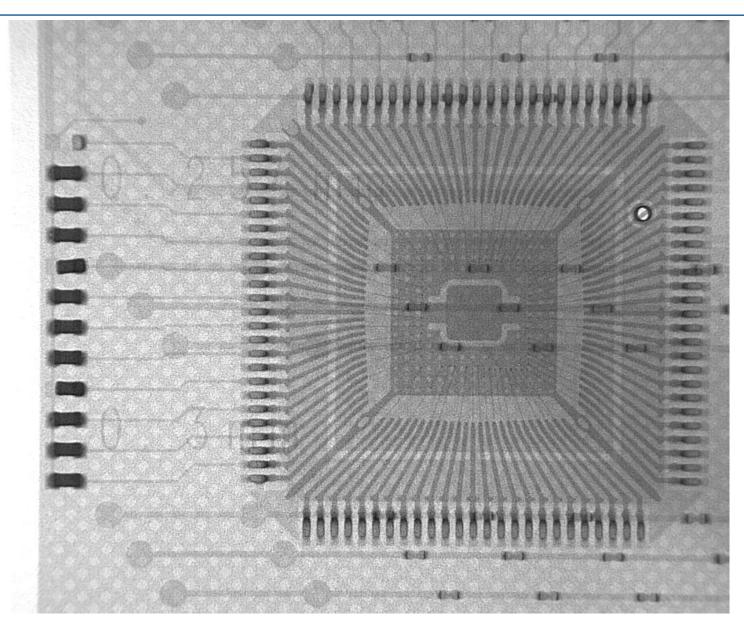






R+R 25 / Z – X-Ray nach Rework 2 – PZP-S-PQFP-G100

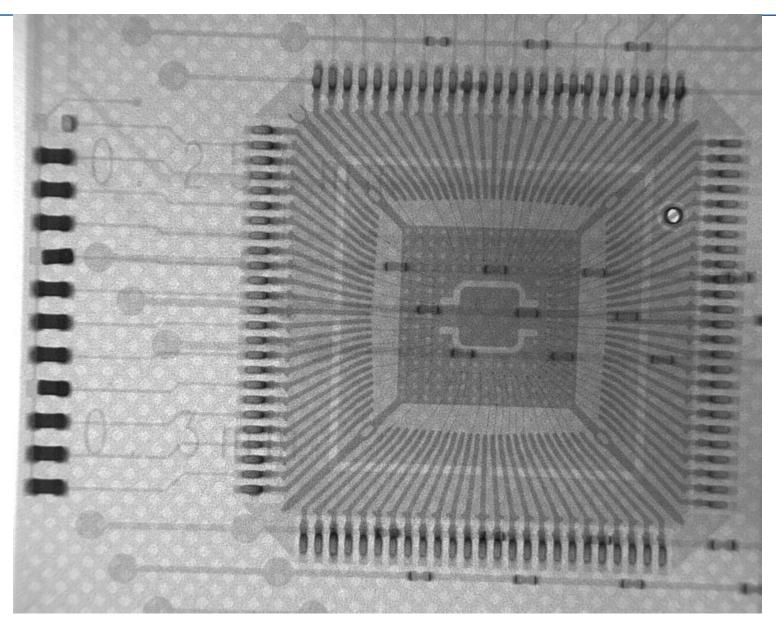






R+R 25 / Z – X-Ray nach Rework 3 – PZP-S-PQFP-G100

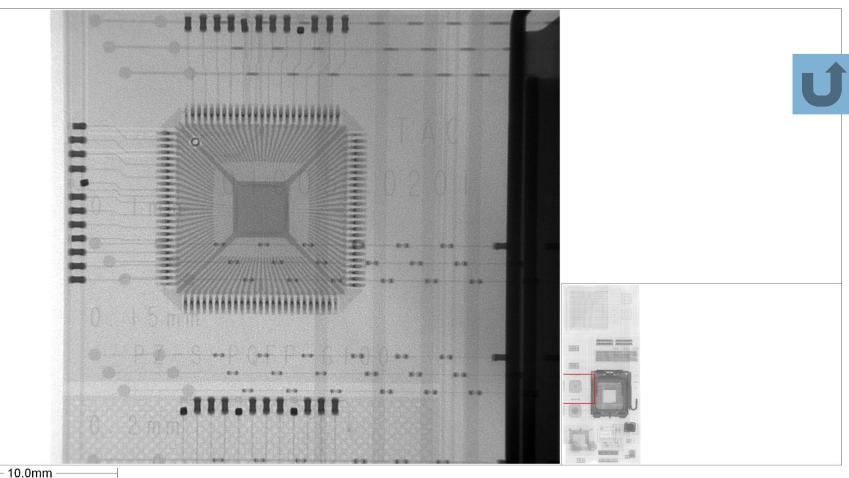






R+R 25 / Z – X-Ray vor Rework – PZ-S-PQFP-G100





PCB and Electronic Systems - Rework elektronischer Baugruppen

Röhren Spannung:

Filter Stärke: 80

Filter in Verwendung:

Akkumulierung: 64 Frames

Röhren Leistung:

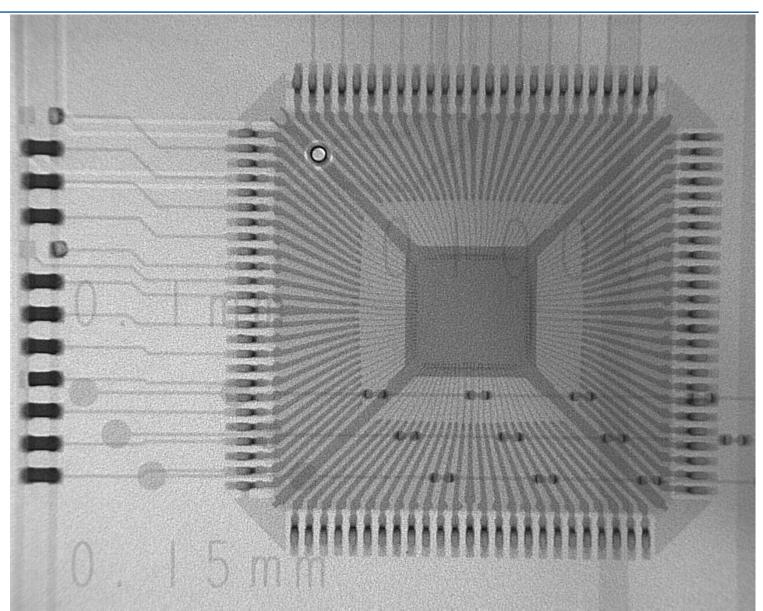
120 kV

2.19 W

Medium-High Mag

R+R 25 / Z - X-Ray nach Rework 1 - PZ-S-PQFP-G100

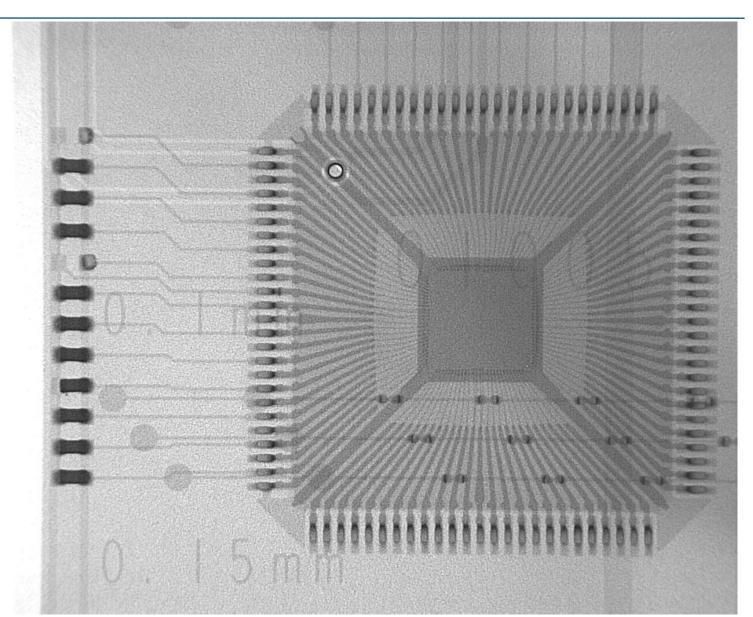






R+R 25 / Z - X-Ray nach Rework 2 - PZ-S-PQFP-G100

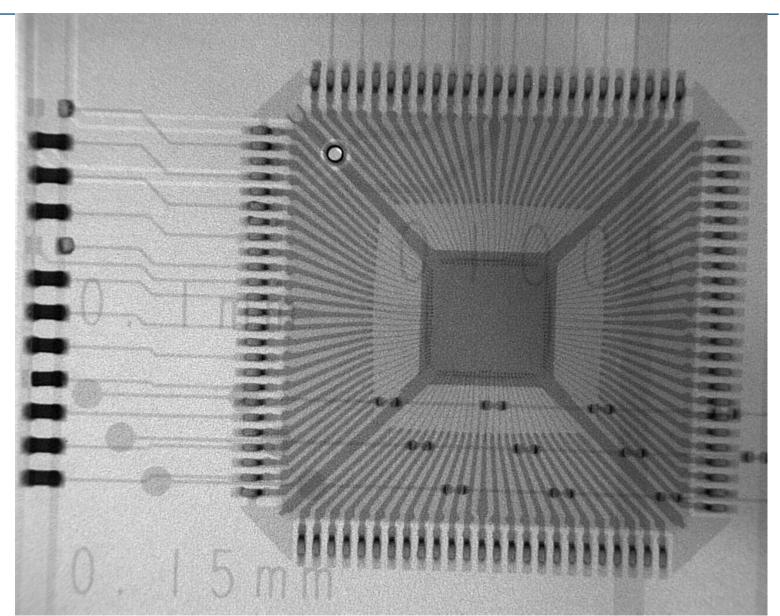






R+R 25 / Z - X-Ray nach Rework 3 - PZ-S-PQFP-G100





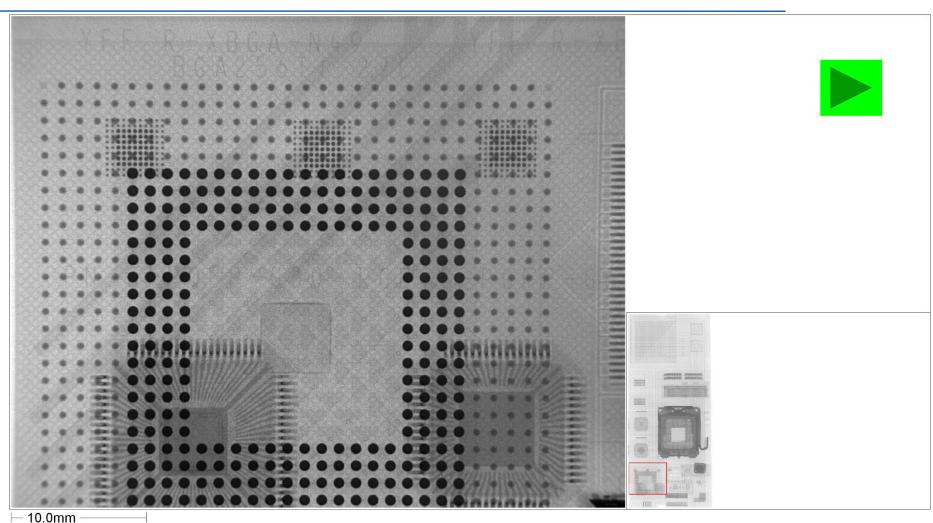




Baugruppe R+R 26 / Z

R+R 26 / Z – X-Ray vor Rework – BGA 256





Filter Stärke: 80 Akkumulierung: 64 Frames

PCB and Electronic Systems – Rework elektronischer Baugruppen

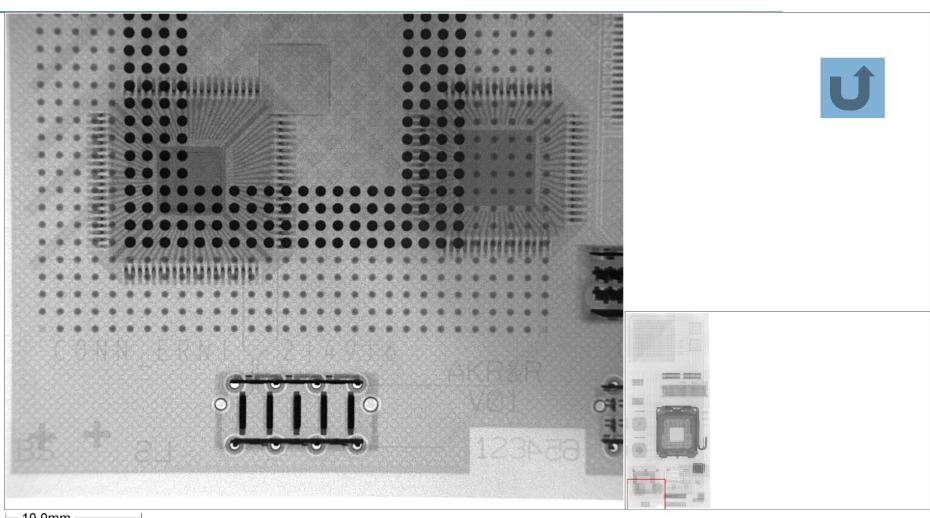
Röhren Spannung:

Röhren Leistung: Filter in Verwendung: 120 kV 2.19 W

Medium-High Mag

R+R 26 / Z – X-Ray vor Rework – BGA 256





10.0mm

Röhren Spannung: 120 kV Röhren Leistung: 2.20 W

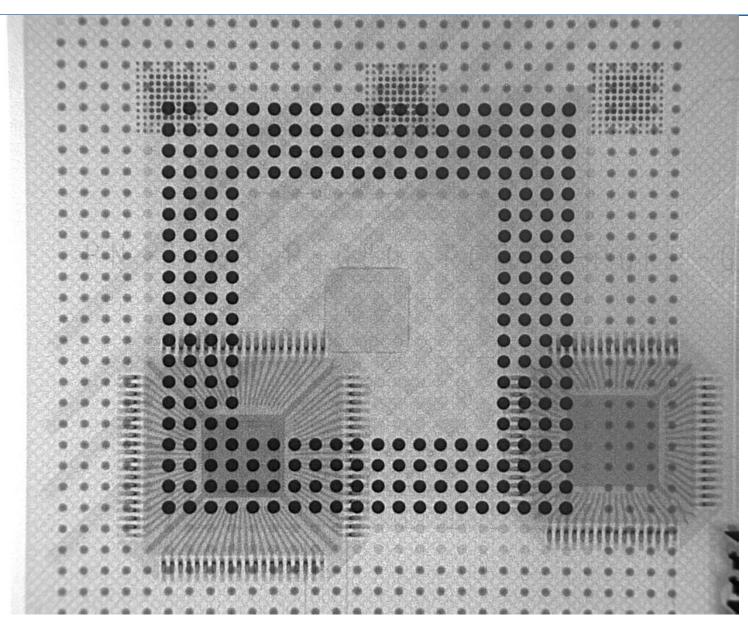
Filter in Verwendung: Medium-High Mag

Filter Stärke:

Akkumulierung: 64 Frames

R+R 26 / Z - X-Ray nach Rework 1 - BGA 256

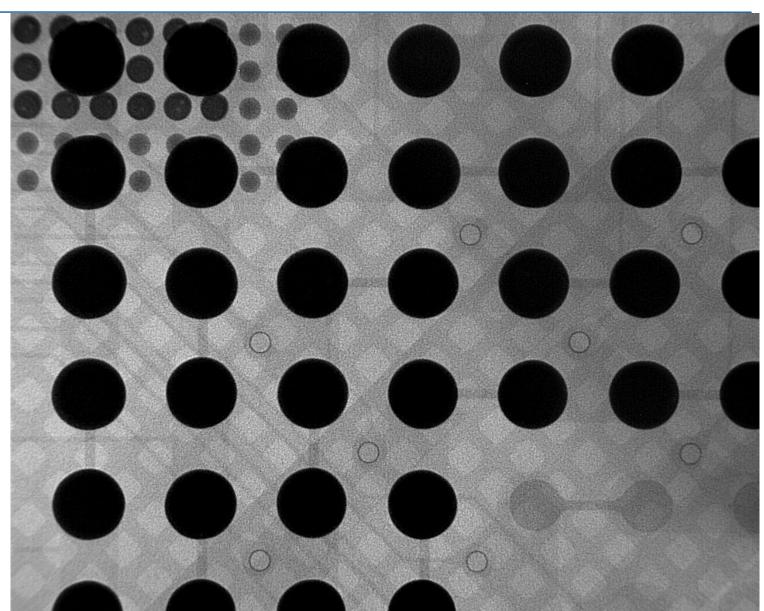






R+R 26 / Z - X-Ray nach Rework 1 / Detail - BGA 256

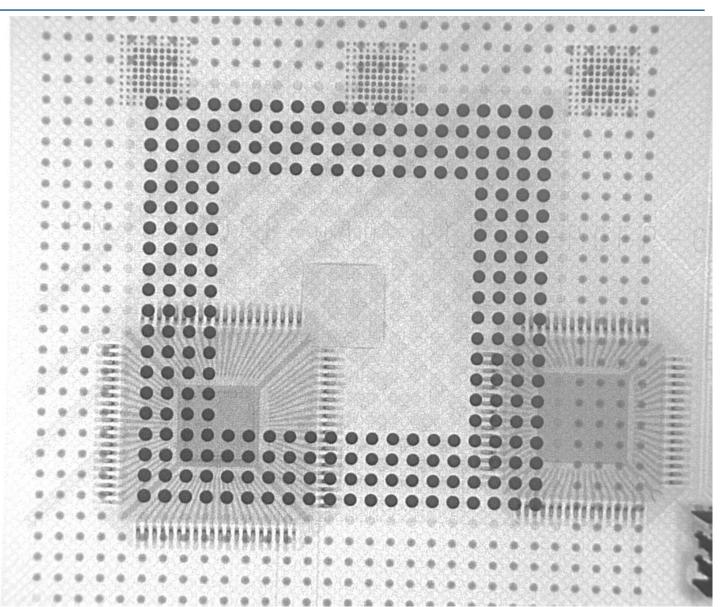






R+R 26 / Z - X-Ray nach Rework 2 - BGA 256

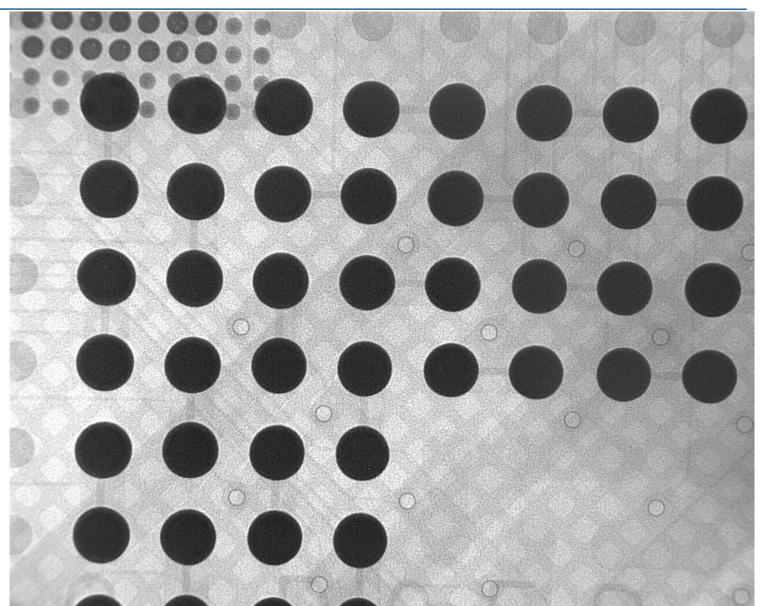






R+R 26 / Z - X-Ray nach Rework 2 / Detail - BGA 256

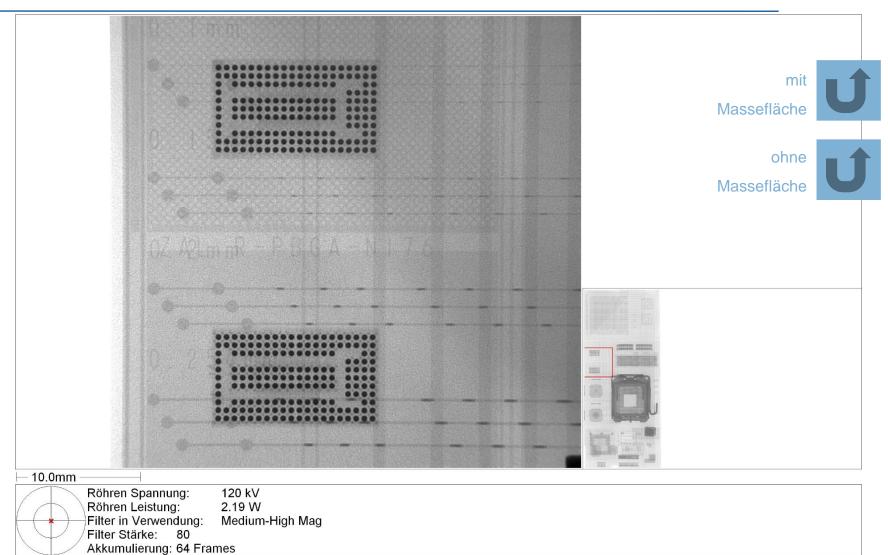






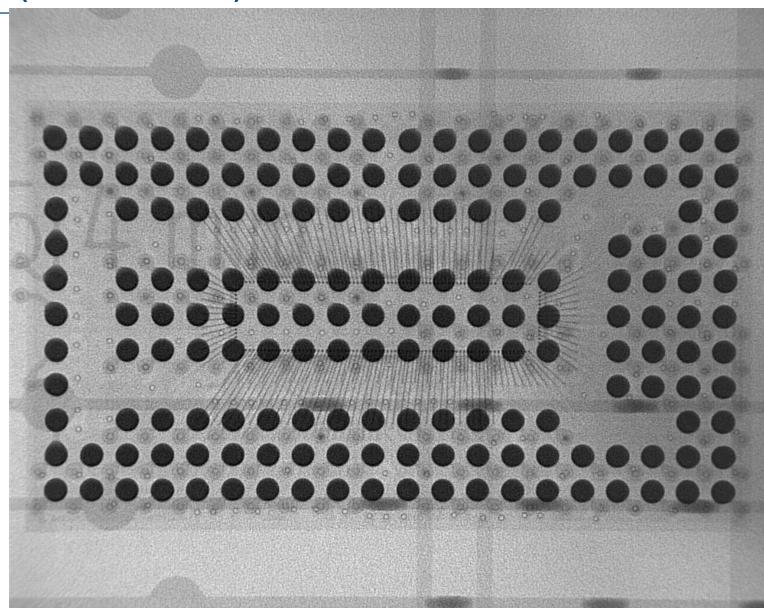
R+R 26 / Z – X-Ray vor Rework – ZAL R-PBGA-N176





R+R 26 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (mit Massefläche)

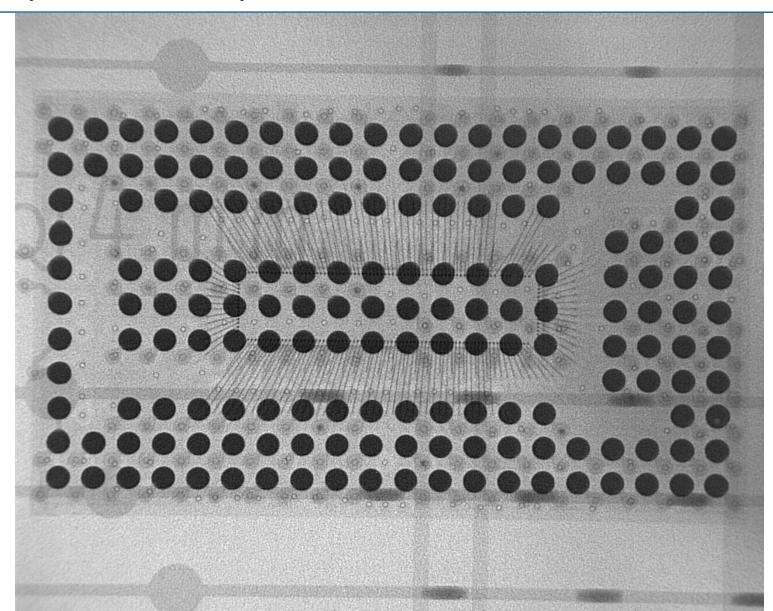






R+R 26 / Z – X-Ray nach Rework 2 – ZAL R-PBGA-N176 (mit Massefläche)

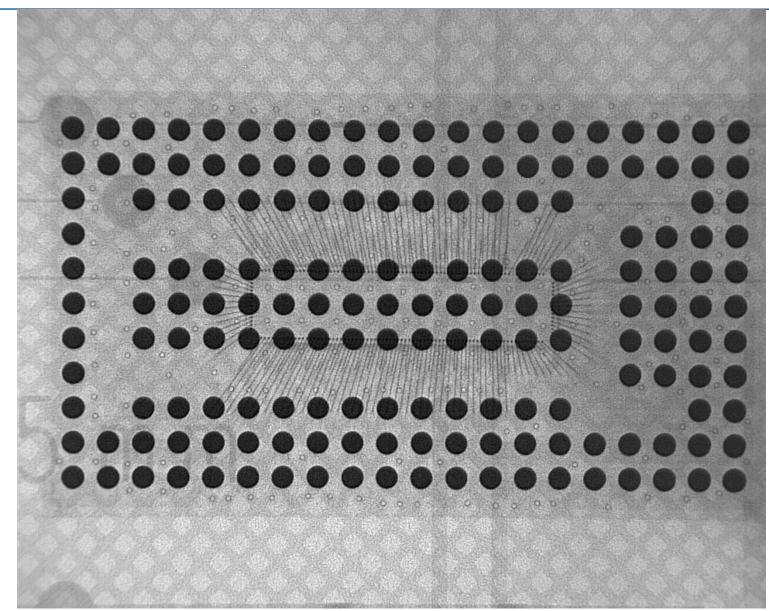






R+R 26 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (ohne Massefläche)

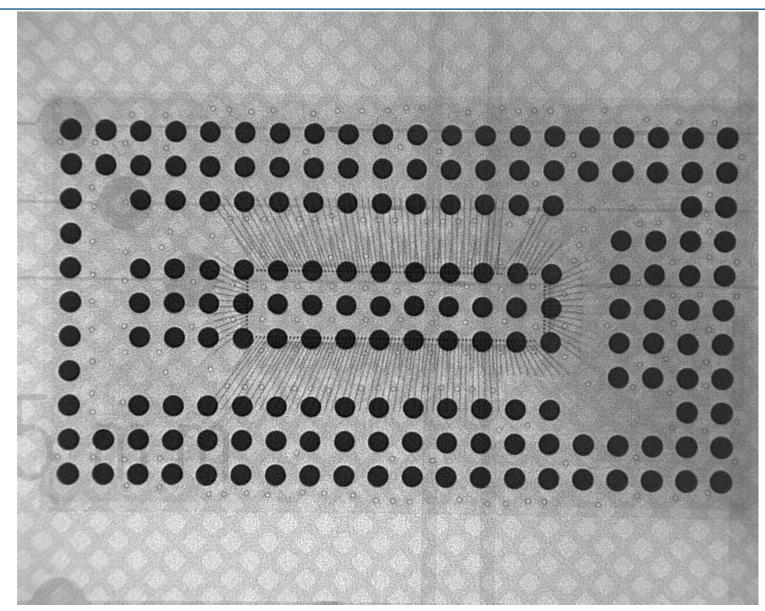






R+R 26 / Z – X-Ray nach Rework 2 – ZAL R-PBGA-N176 (ohne Massefläche)

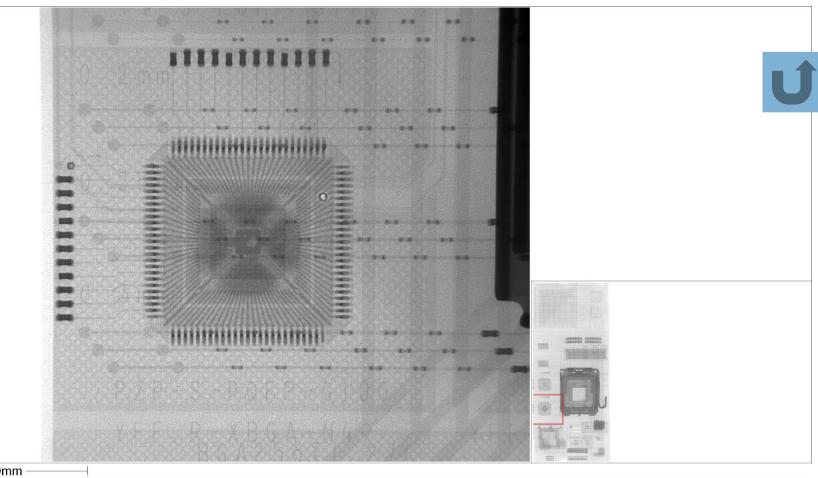






R+R 26 / Z - X-Ray vor Rework - PZP-S-PQFP-G100





10.0mm

Röhren Spannung: 120 kV 2.20 W Röhren Leistung:

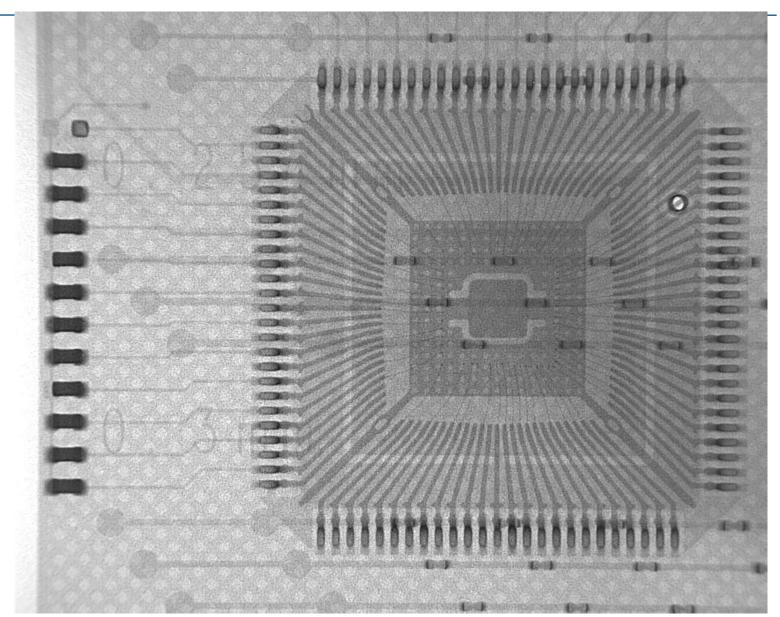
Filter in Verwendung: Medium-High Mag

Filter Stärke: 80

Akkumulierung: 64 Frames

R+R 26 / Z – X-Ray nach Rework 1 – PZP-S-PQFP-G100



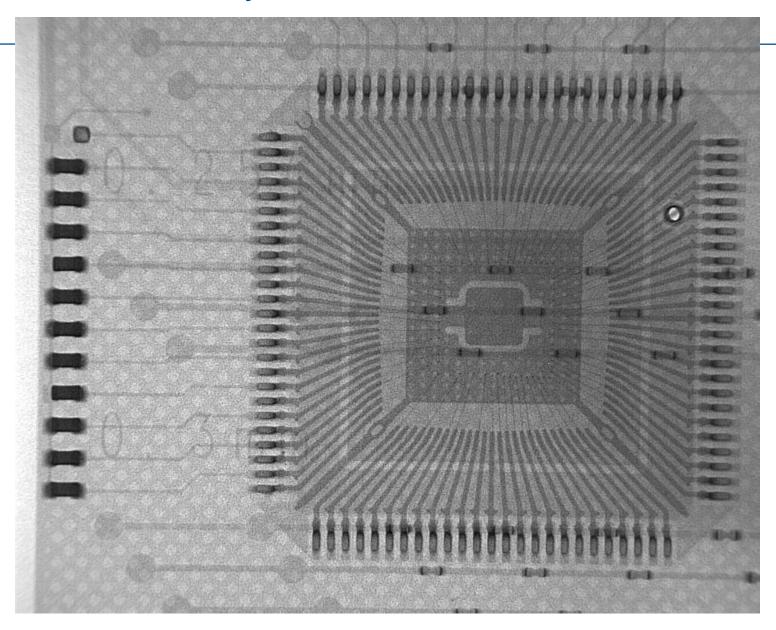




R+R 26 / Z – X-Ray nach Rework 2 – PZP-S-PQFP-G100

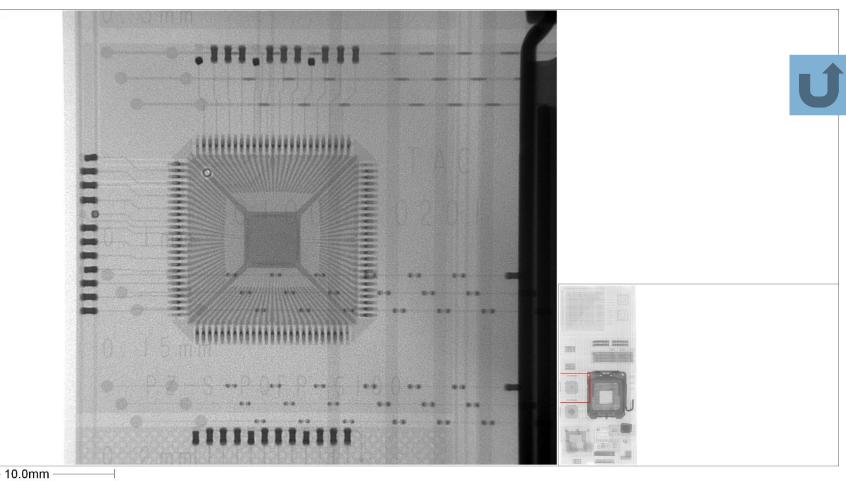






R+R 26 / Z – X-Ray vor Rework – PZ-S-PQFP-G100





PCB and Electronic Systems – Rework elektronischer Baugruppen

Röhren Spannung:

Filter Stärke: 80

Akkumulierung: 64 Frames

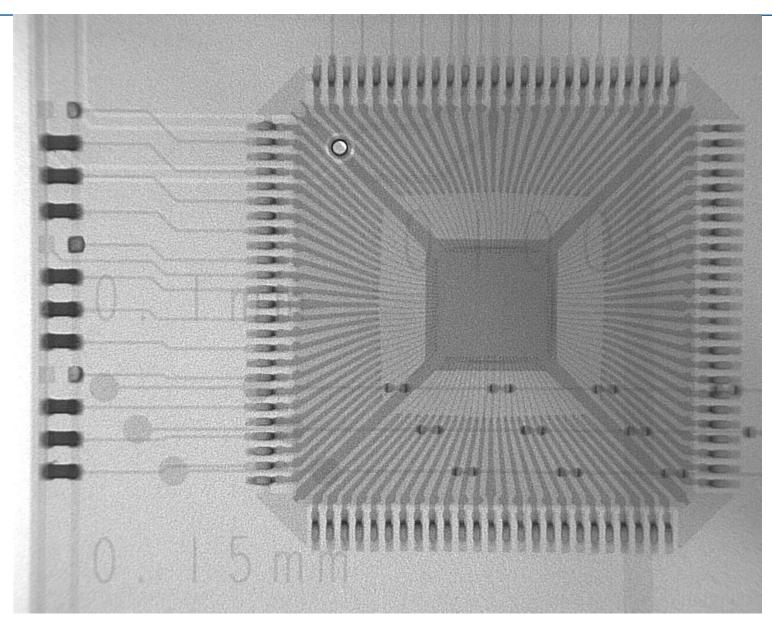
Röhren Leistung: Filter in Verwendung: 120 kV

2.19 W

Medium-High Mag

R+R 26 / Z - X-Ray nach Rework 1 - PZ-S-PQFP-G100

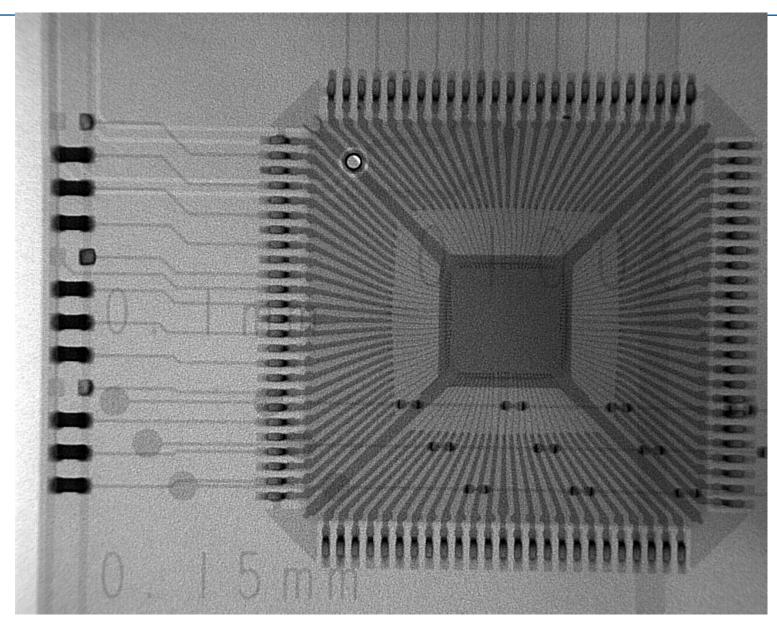






R+R 26 / Z - X-Ray nach Rework 2 - PZ-S-PQFP-G100





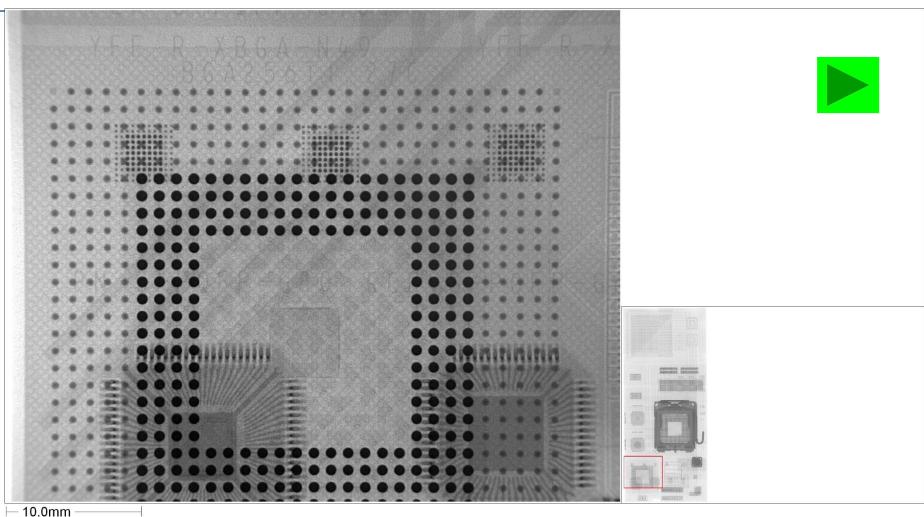




Baugruppe R+R 27 / Z

R+R 27 / Z - X-Ray vor Rework - BGA 256





Röhren Spannung: 120 kV Röhren Leistung: 2.19 W

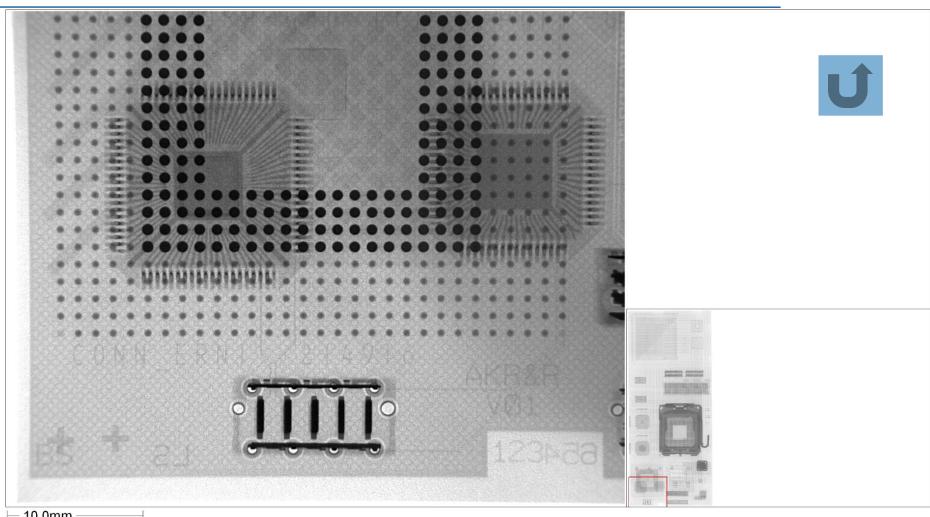
Filter in Verwendung: Medium-High Mag

Filter Stärke: 80

Akkumulierung: 64 Frames

R+R 27 / Z - X-Ray vor Rework - BGA 256





10.0mm

Röhren Spannung: 120 kV Röhren Leistung: 2.20 W

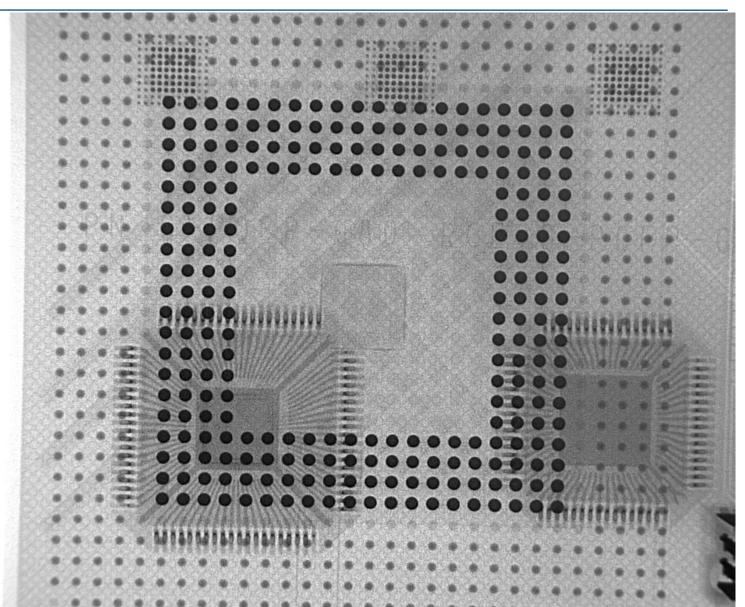
Filter in Verwendung: Medium-High Mag

Filter Stärke:

Akkumulierung: 64 Frames

R+R 27 / Z – X-Ray nach Rework 1 – BGA 256

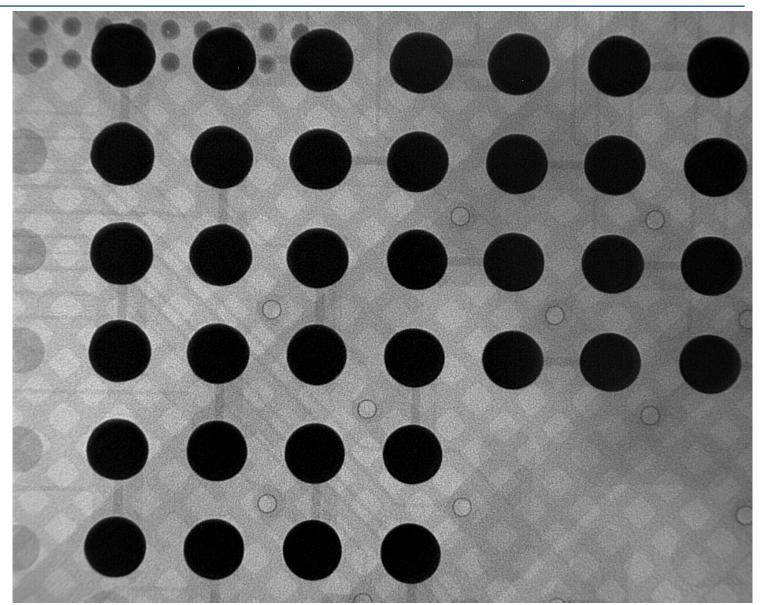






R+R 27 / Z - X-Ray nach Rework 1 / Detail - BGA 256

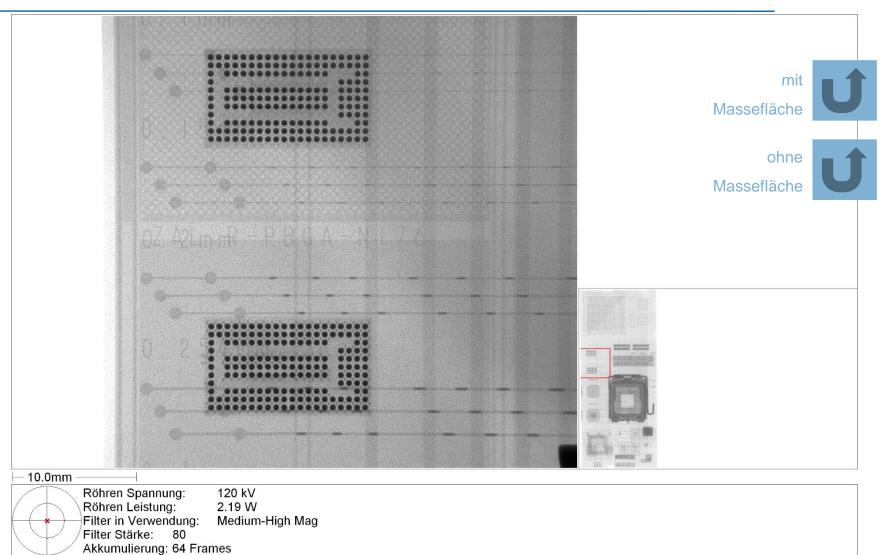






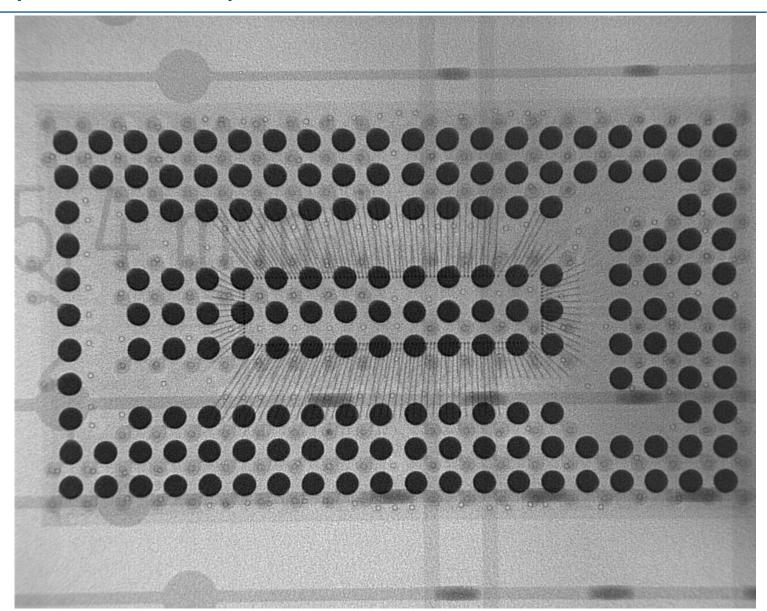
R+R 27 / Z - X-Ray vor Rework - ZAL R-PBGA-N176





R+R 27 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (mit Massefläche)

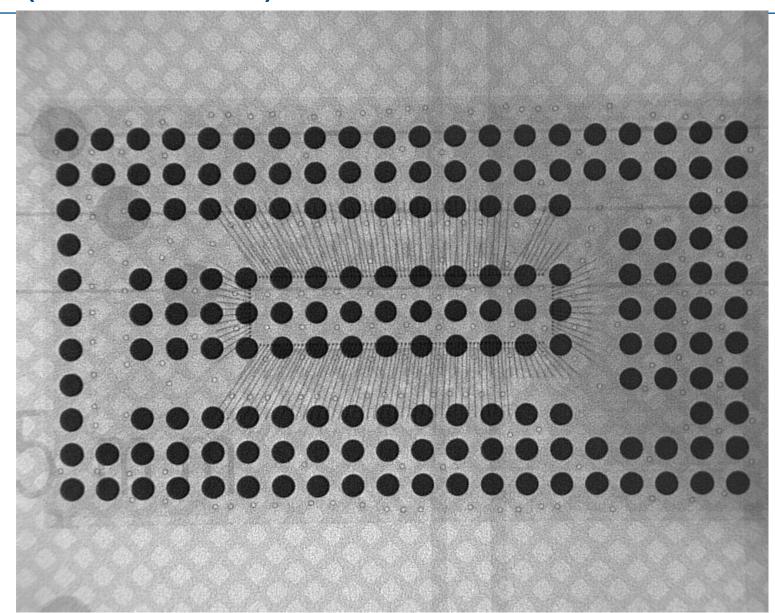






R+R 27 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (ohne Massefläche)

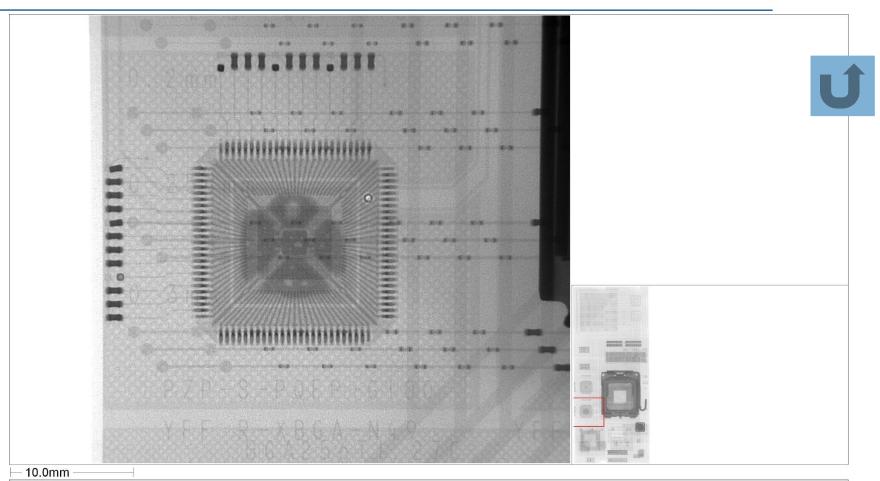






R+R 27 / Z – X-Ray vor Rework – PZP-S-PQFP-G100





Filte

Röhren Spannung: 120 kV Röhren Leistung: 2.20 W

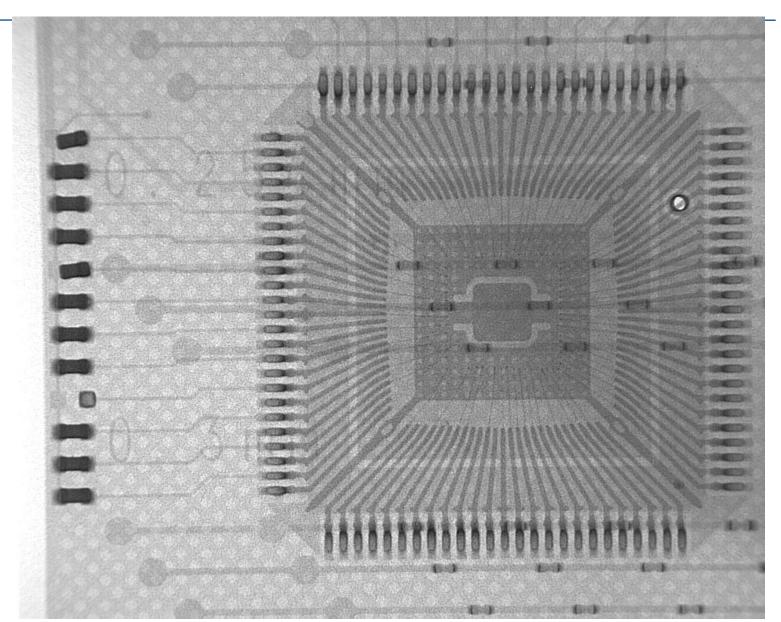
Filter in Verwendung: Medium-High Mag

Filter Stärke: 80

Akkumulierung: 64 Frames

R+R 27 / Z – X-Ray nach Rework 1 – PZP-S-PQFP-G100

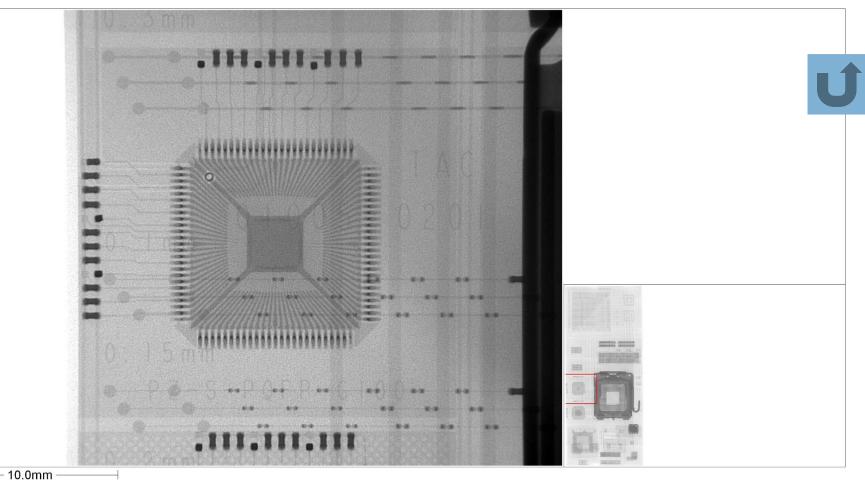






R+R 27 / Z – X-Ray vor Rework – PZ-S-PQFP-G100





PCB and Electronic Systems - Rework elektronischer Baugruppen

Röhren Spannung:

Filter Stärke: 80

Akkumulierung: 64 Frames

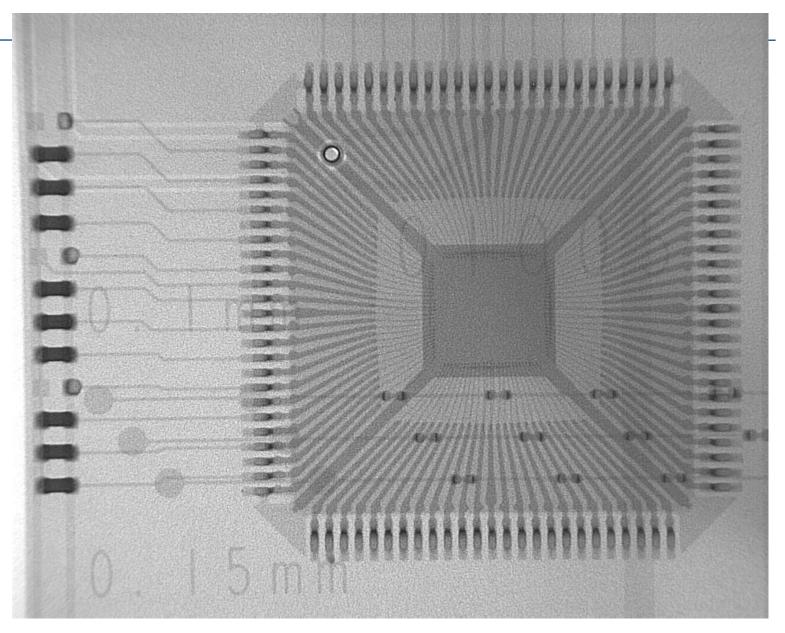
Röhren Leistung: Filter in Verwendung: 120 kV 2.20 W

Medium-High Mag

R+R 27 / Z - X-Ray nach Rework 1 - PZ-S-PQFP-G100





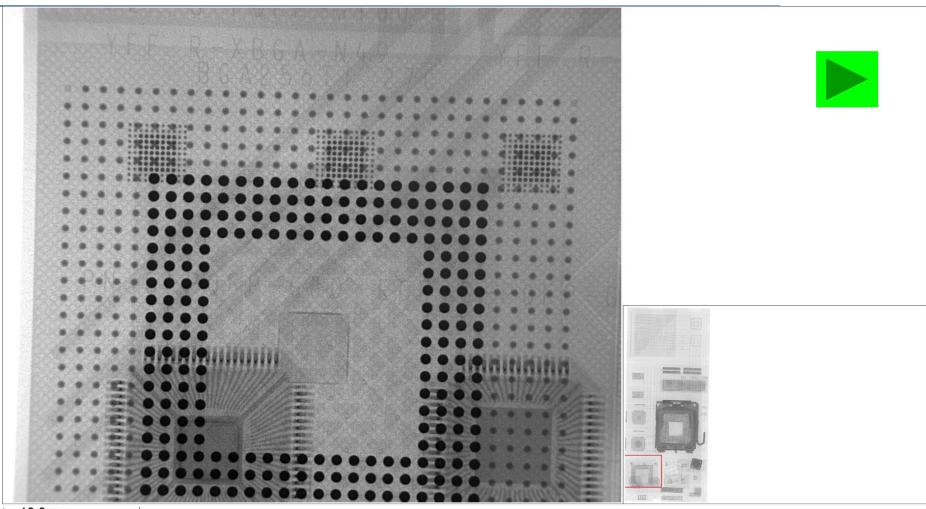




Baugruppe R+R 28 / Z

R+R 28 / Z – X-Ray vor Rework – BGA 256





- 10.0mm

Röhren Spannung: 120 kV Röhren Leistung: 2.20 W

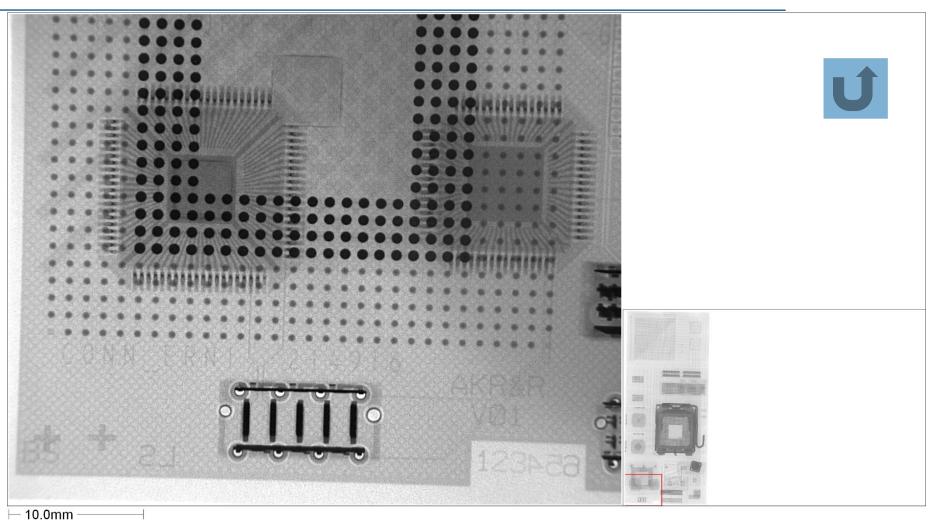
Filter in Verwendung: Medium-High Mag

Filter Stärke: 80

Akkumulierung: 64 Frames

R+R 28 / Z – X-Ray vor Rework – BGA 256





Filter Stärke: 80 Akkumulierung: 64 Frames

Filter in Verwendung:

Röhren Spannung:

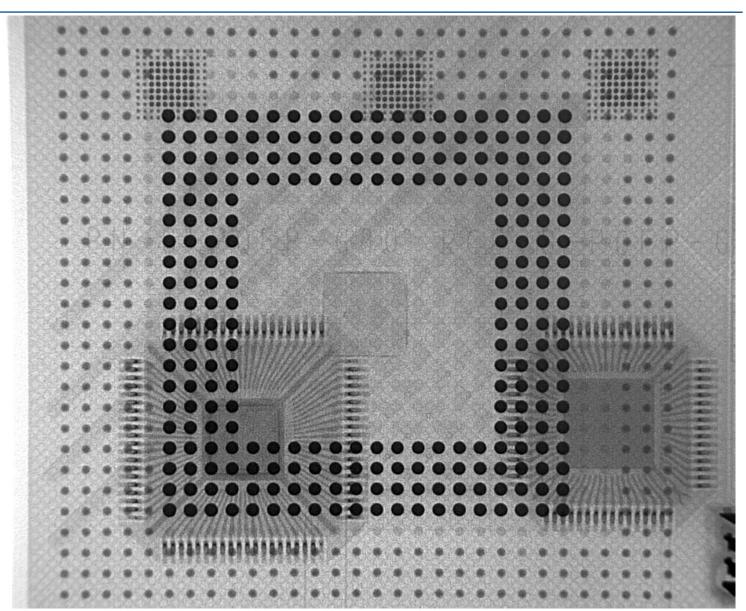
Röhren Leistung:

120 kV 2.19 W

Medium-High Mag

R+R 28 / Z - X-Ray nach Rework 1 - BGA 256

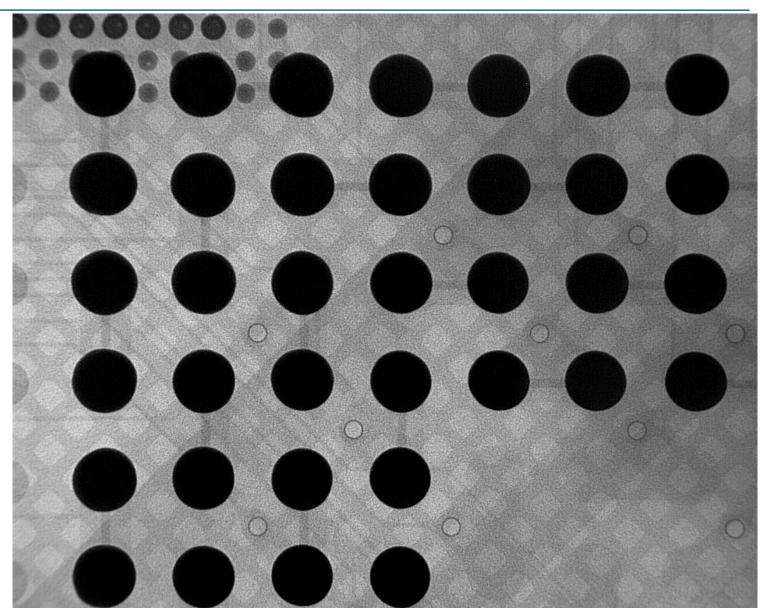






R+R 28 / Z - X-Ray nach Rework 1 / Detail - BGA 256

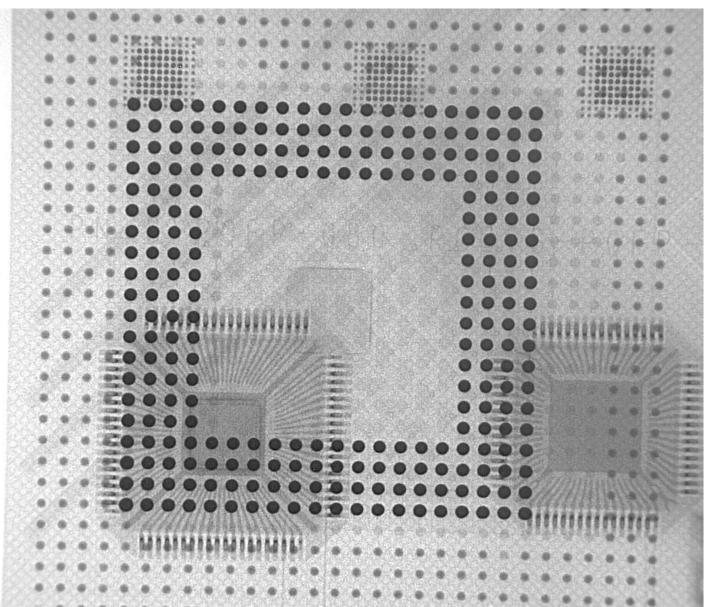






R+R 28 / Z - X-Ray nach Rework 2 - BGA 256

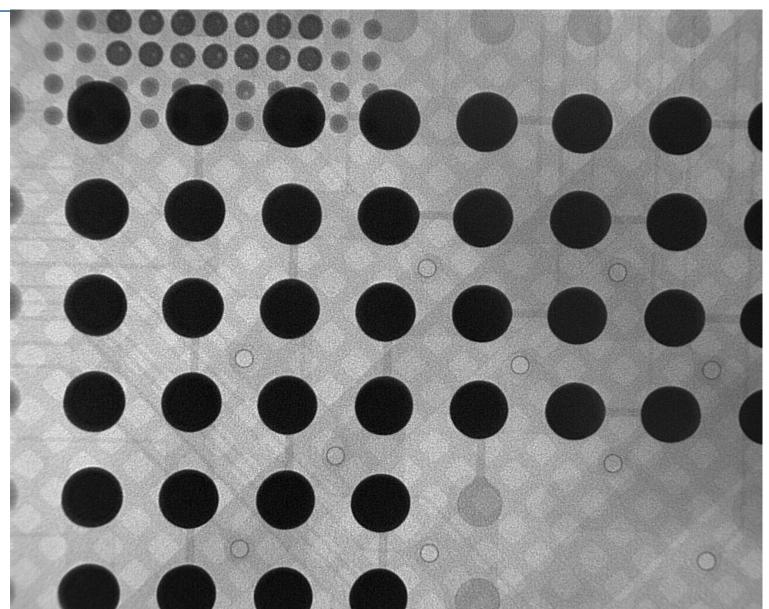






R+R 28 / Z - X-Ray nach Rework 2 / Detail - BGA 256

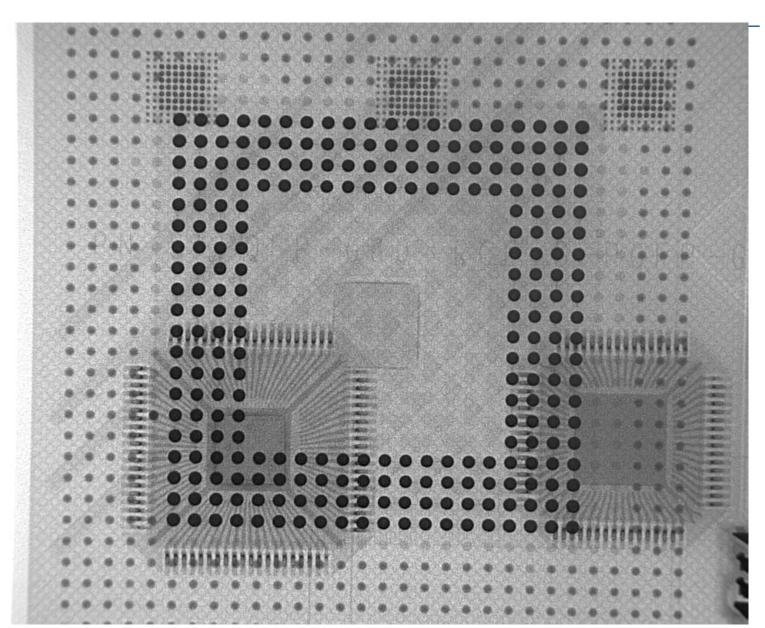






R+R 28 / Z - X-Ray nach Rework 3 - BGA 256

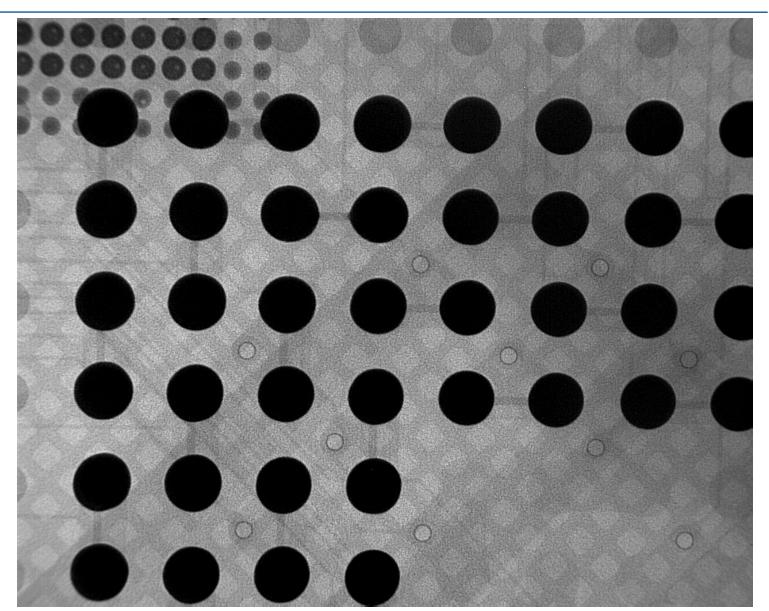






R+R 28 / Z - X-Ray nach Rework 3 / Detail - BGA 256

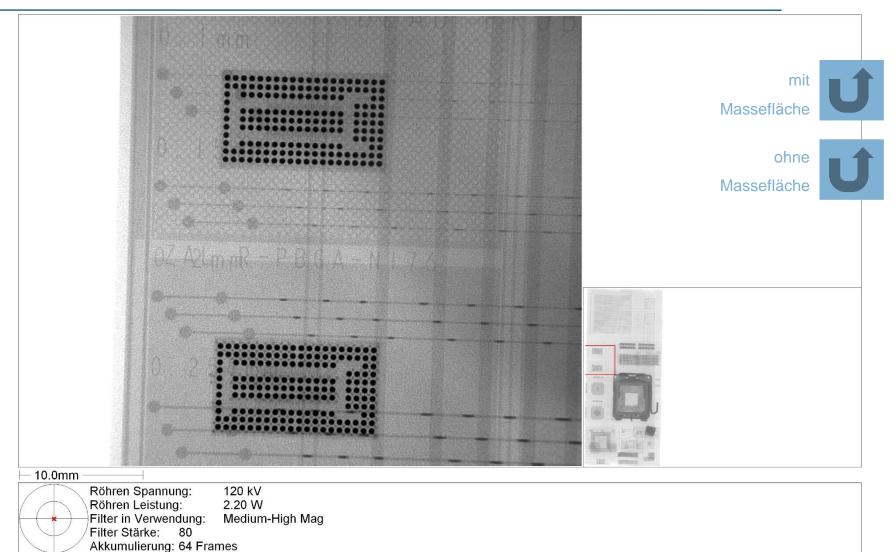






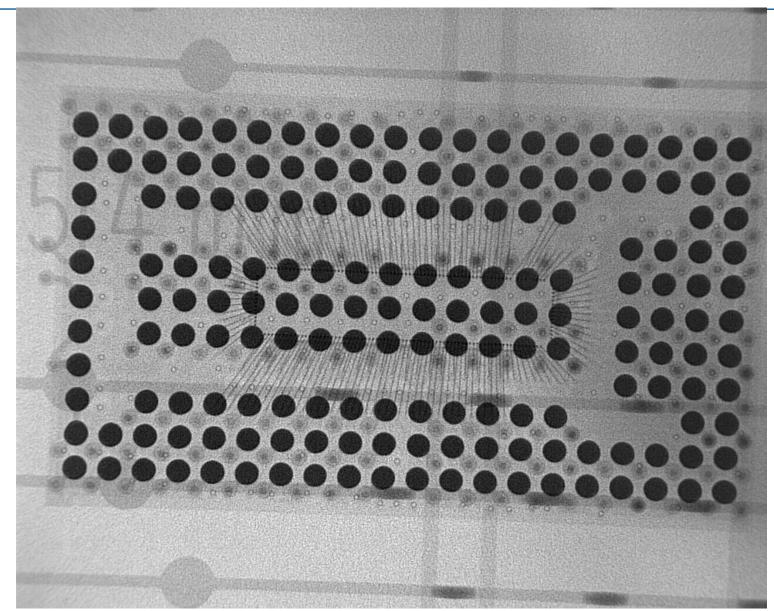
R+R 28 / Z – X-Ray vor Rework – ZAL R-PBGA-N176





R+R 28 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (mit Massefläche)

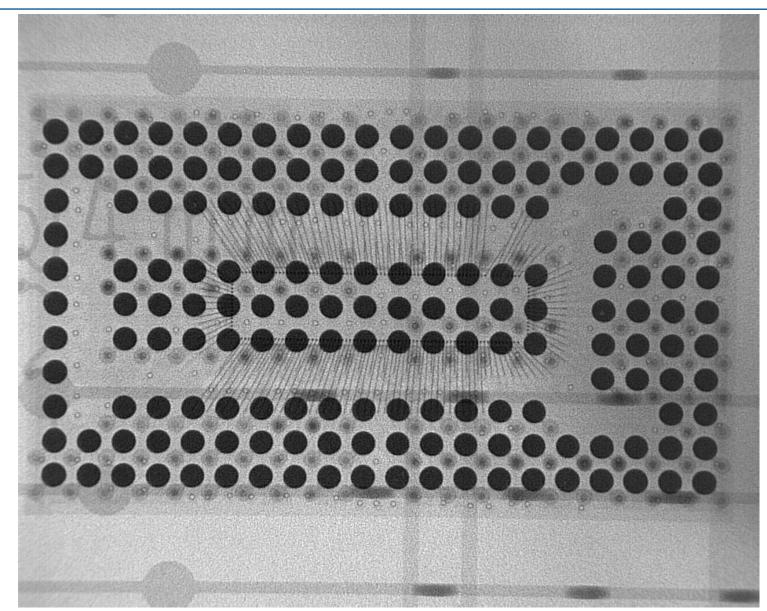






R+R 28 / Z – X-Ray nach Rework 2 – ZAL R-PBGA-N176 (mit Massefläche)

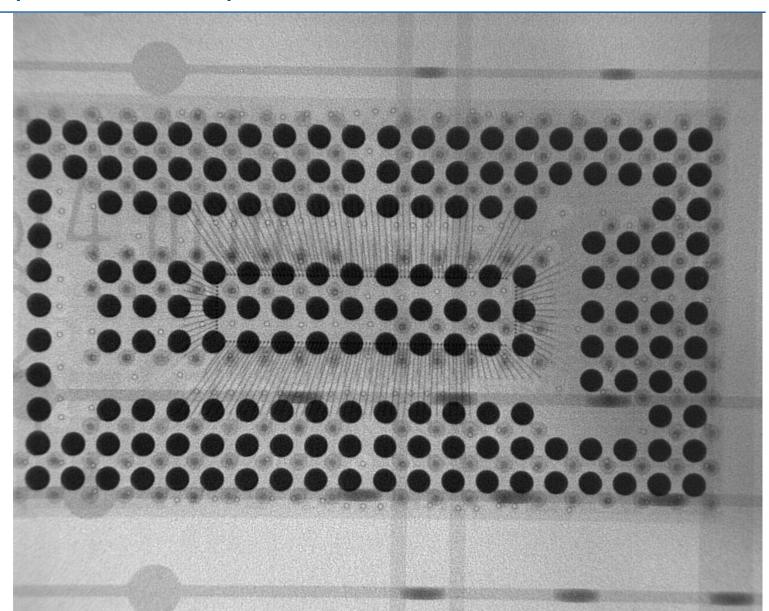






R+R 28 / Z – X-Ray nach Rework 3 – ZAL R-PBGA-N176 (mit Massefläche)

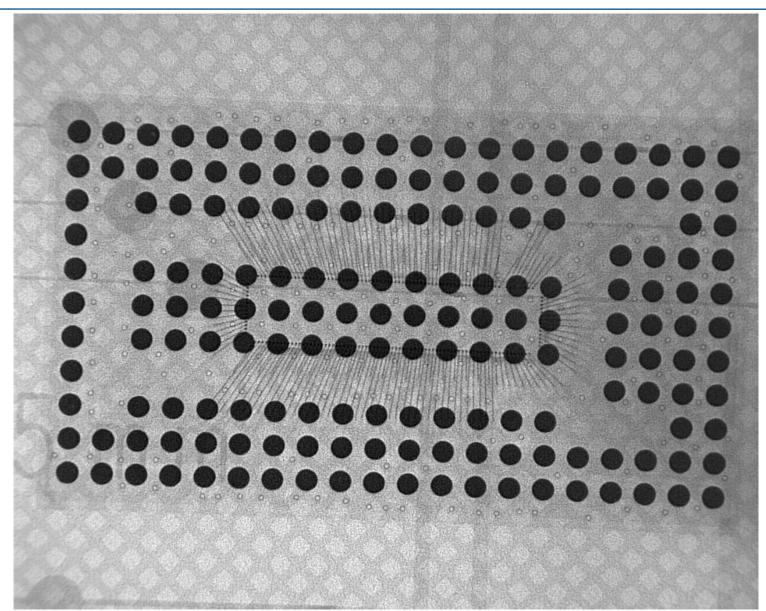






R+R 28 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (ohne Massefläche)

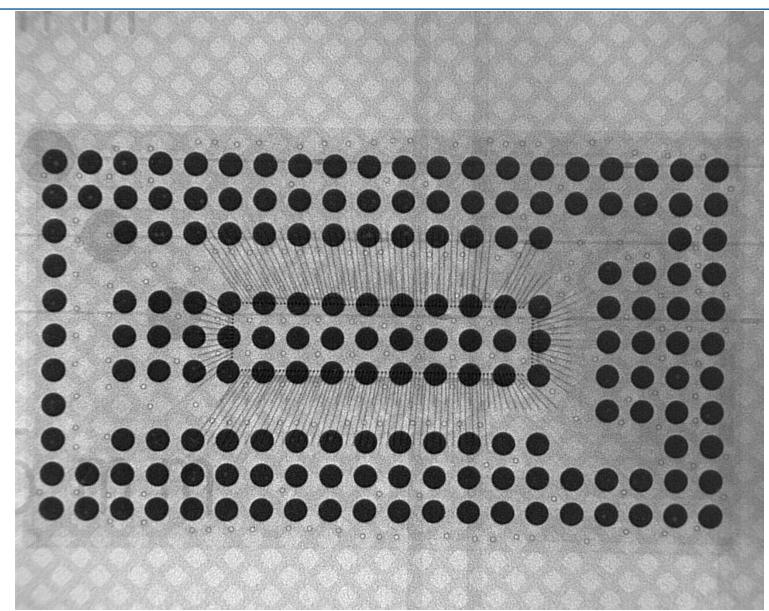






R+R 28 / Z – X-Ray nach Rework 2 – ZAL R-PBGA-N176 (ohne Massefläche)

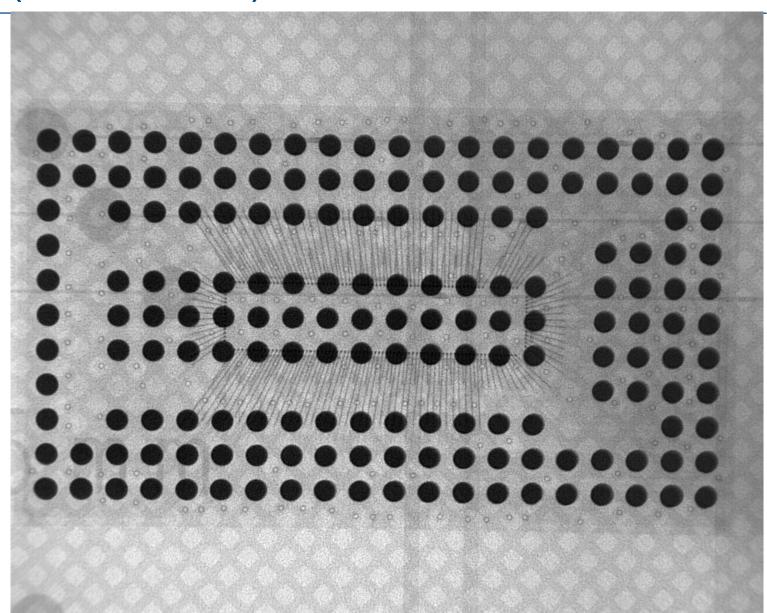






R+R 28 / Z – X-Ray nach Rework 3 – ZAL R-PBGA-N176 (ohne Massefläche)

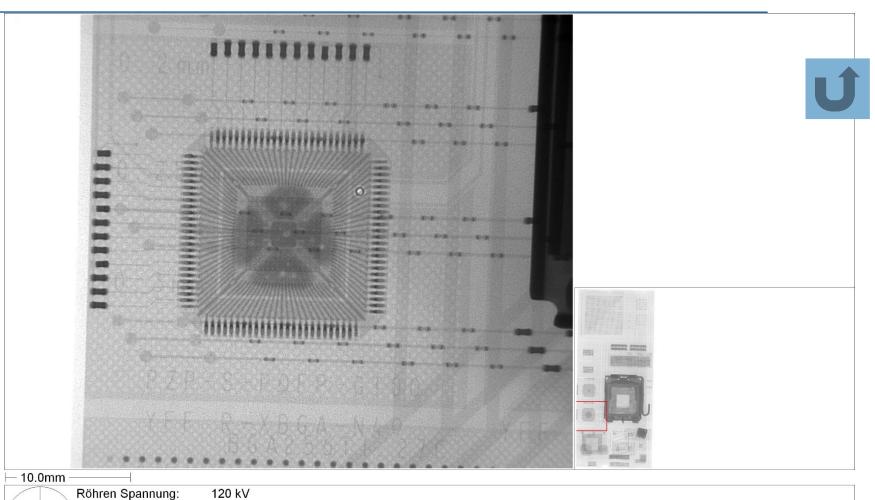






R+R 28 / Z - X-Ray vor Rework - PZP-S-PQFP-G100





PCB and Electronic Systems - Rework elektronischer Baugruppen

Röhren Leistung: Filter in Verwendung:

Filter Stärke: 80

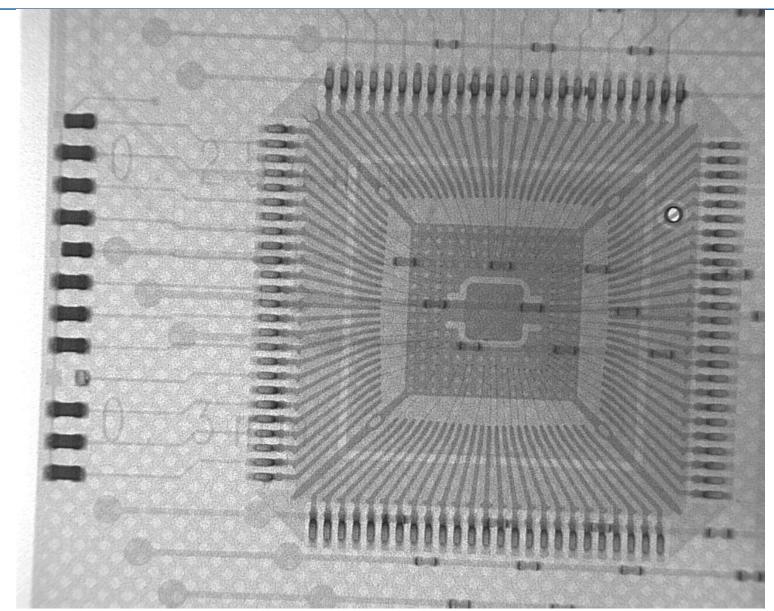
Akkumulierung: 64 Frames

2.19 W

Medium-High Mag

R+R 28 / Z – X-Ray nach Rework 1 – PZP-S-PQFP-G100

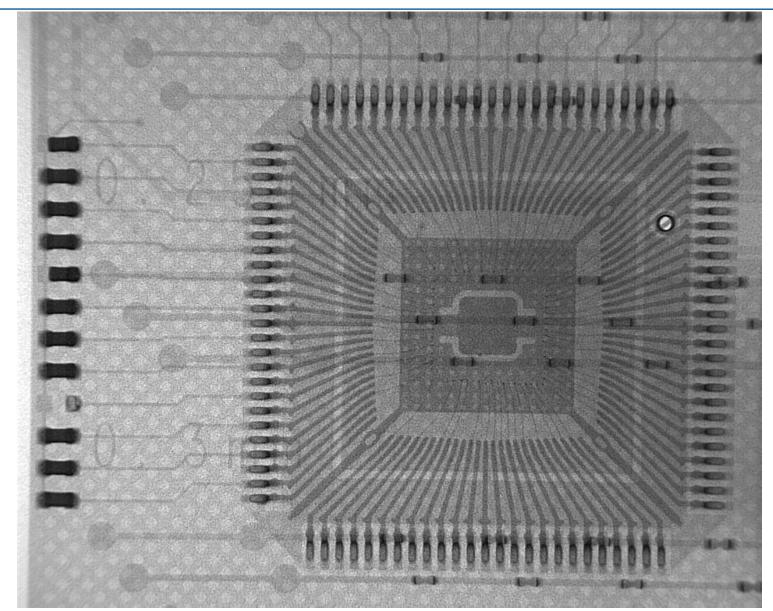






R+R 28 / Z – X-Ray nach Rework 2 – PZP-S-PQFP-G100

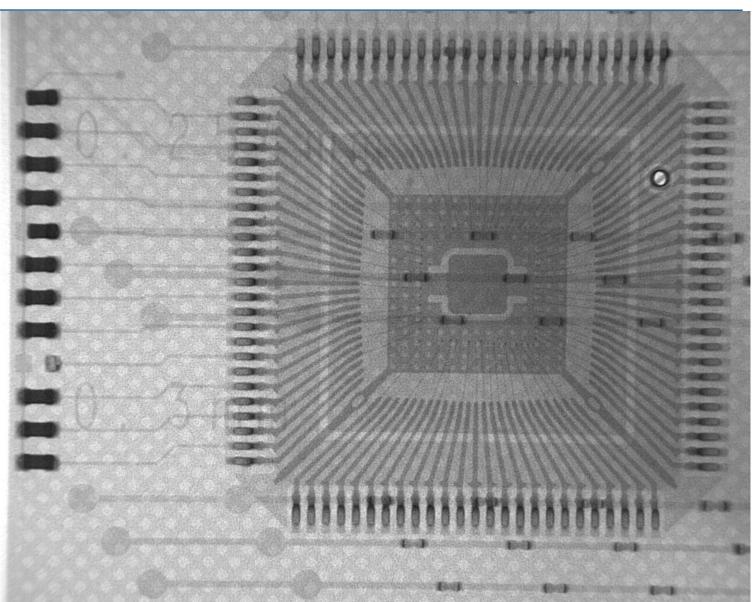






R+R 28 / Z – X-Ray nach Rework 3 – PZP-S-PQFP-G100

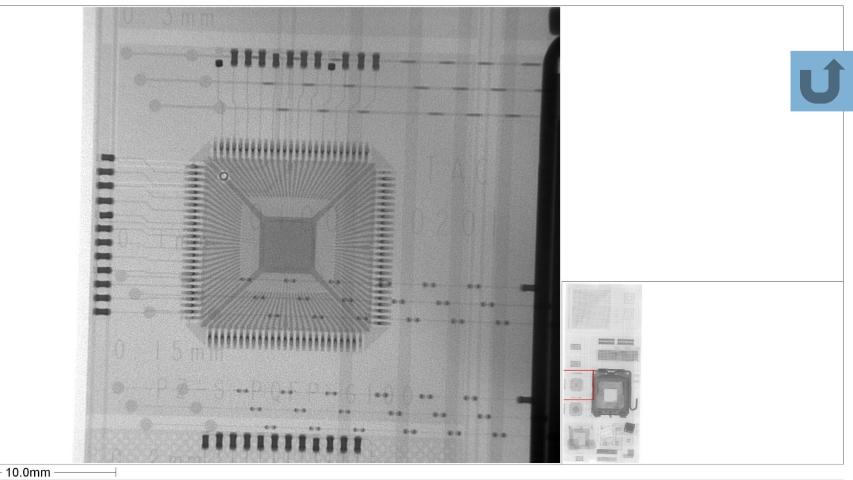






R+R 28 / Z - X-Ray vor Rework - PZ-S-PQFP-G100





Röhren Spannung: 120 kV Röhren Leistung: 2.20 W

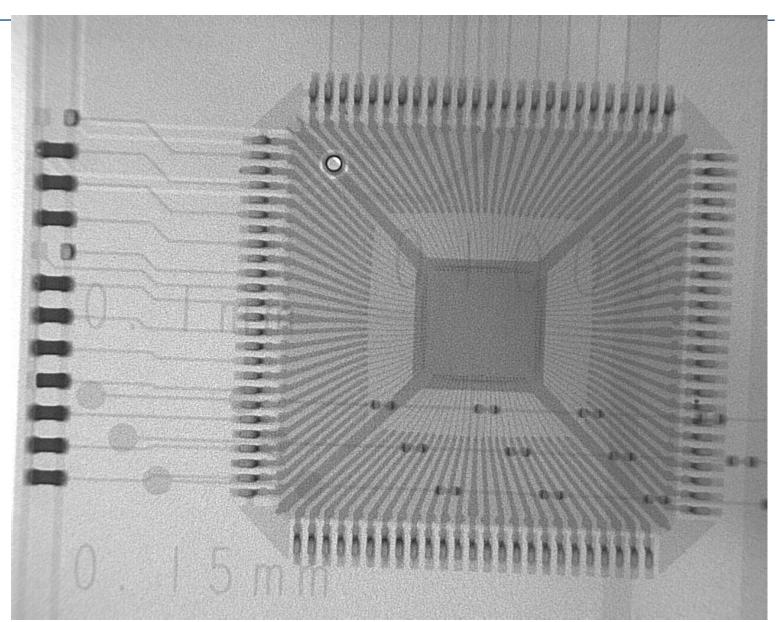
Filter in Verwendung: Medium-High Mag

Filter Stärke: 80

Akkumulierung: 64 Frames

R+R 28 / Z - X-Ray nach Rework 1 - PZ-S-PQFP-G100

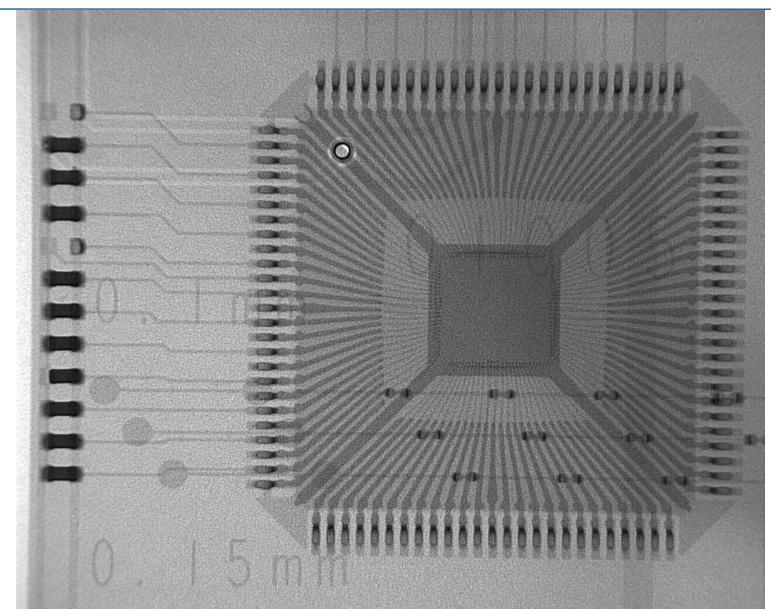






R+R 28 / Z – X-Ray nach Rework 2 – PZ-S-PQFP-G100

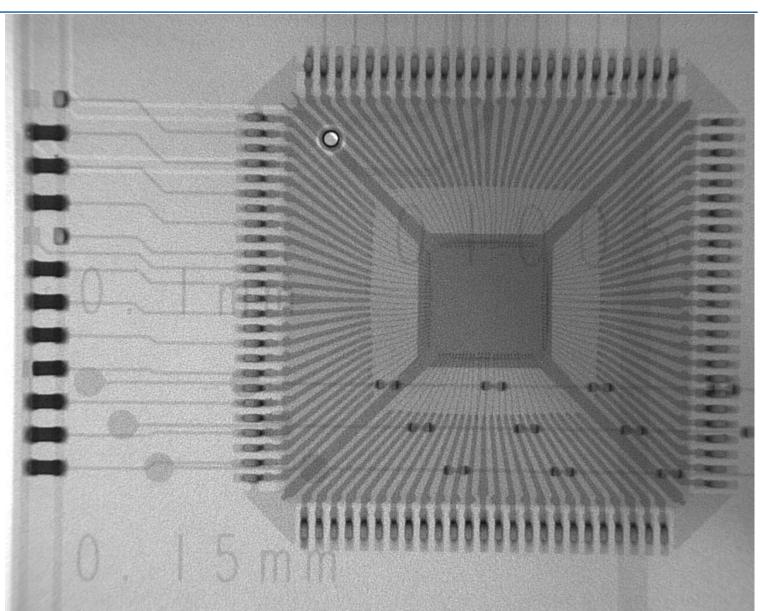






R+R 28 / Z - X-Ray nach Rework 3 - PZ-S-PQFP-G100





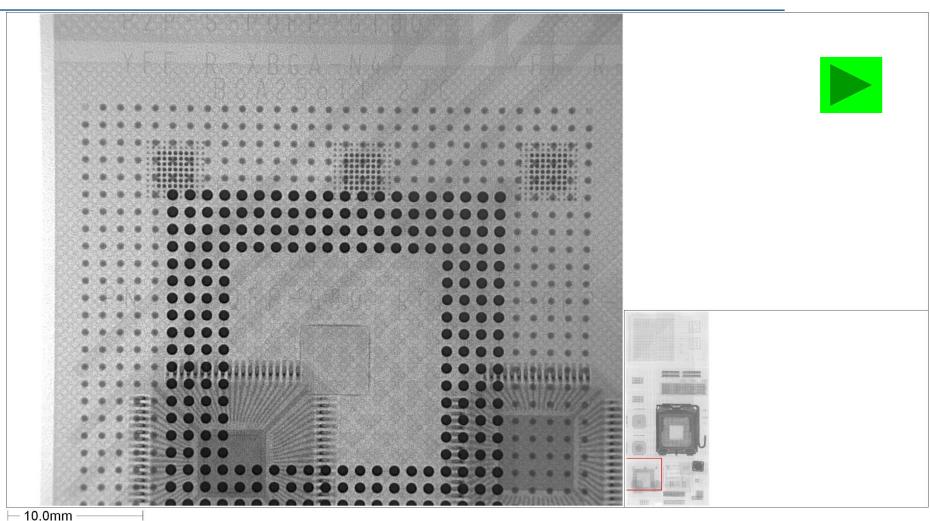




Baugruppe R+R 29 / Z

R+R 29 / Z - X-Ray vor Rework - BGA 256





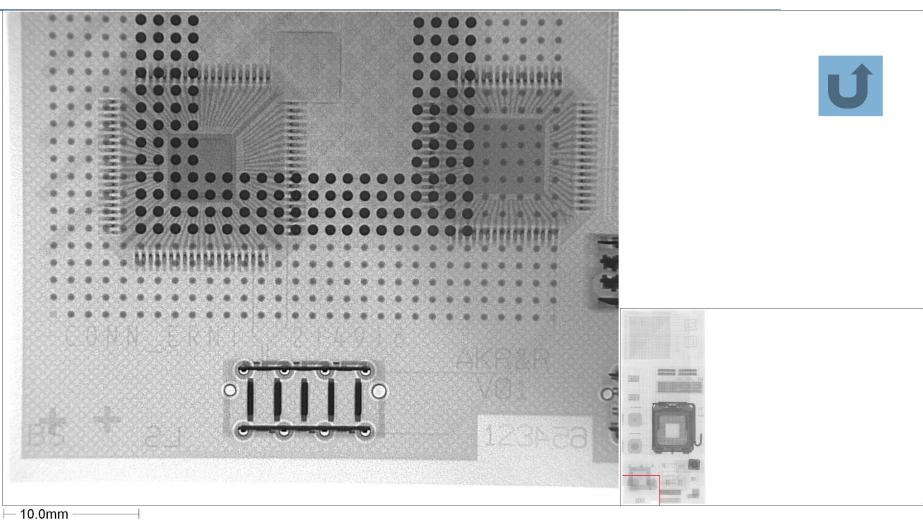
Röhren Spannung: 120 kV Röhren Leistung: 2.19 W

Filter in Verwendung: Medium-High Mag

Filter Stärke: 100 Akkumulierung: 64 Frames

R+R 29 / Z - X-Ray vor Rework - BGA 256





PCB and Electronic Systems – Rework elektronischer Baugruppen

Röhren Spannung:

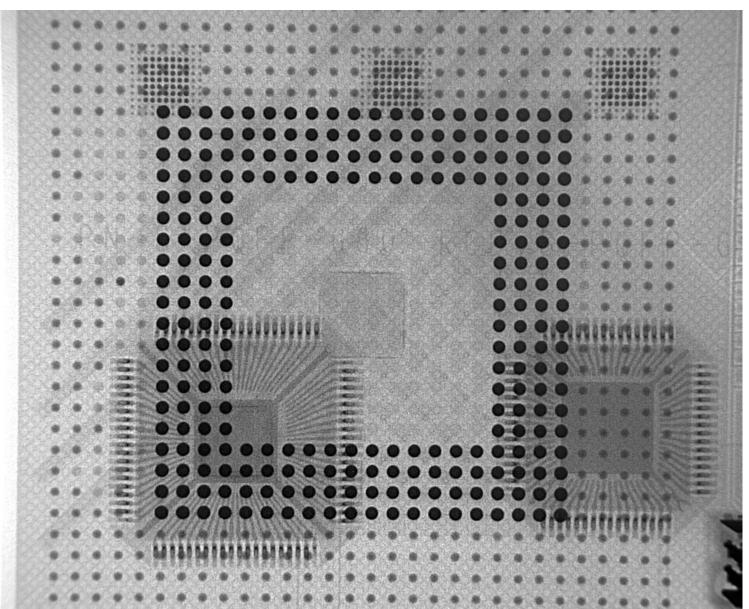
Filter Stärke: 100 Akkumulierung: 64 Frames

Röhren Leistung: Filter in Verwendung: 120 kV 2.20 W

Medium-High Mag

R+R 29 / Z – X-Ray nach Rework 1 – BGA 256

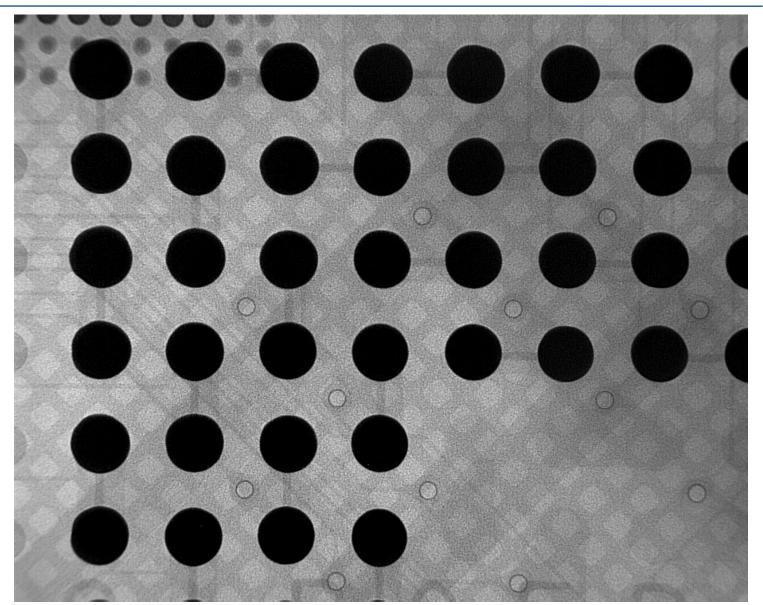






R+R 29 / Z - X-Ray nach Rework 1 / Detail - BGA 256

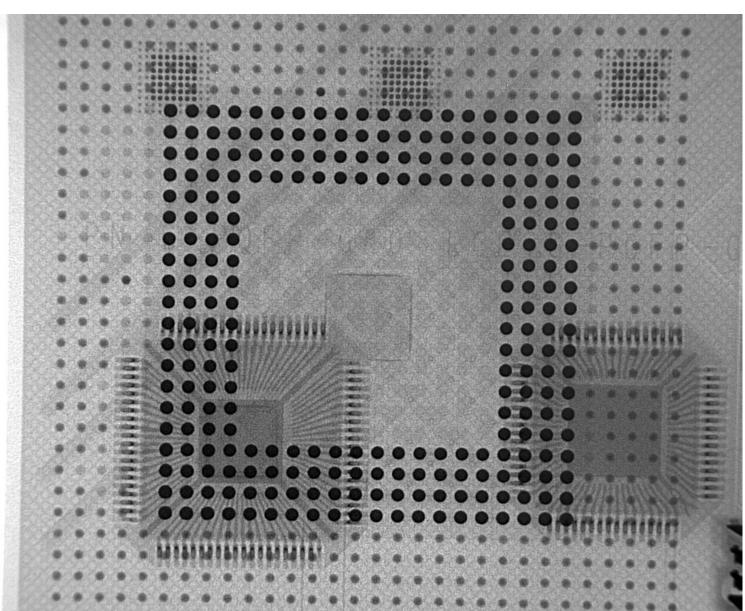






R+R 29 / Z - X-Ray nach Rework 2 - BGA 256

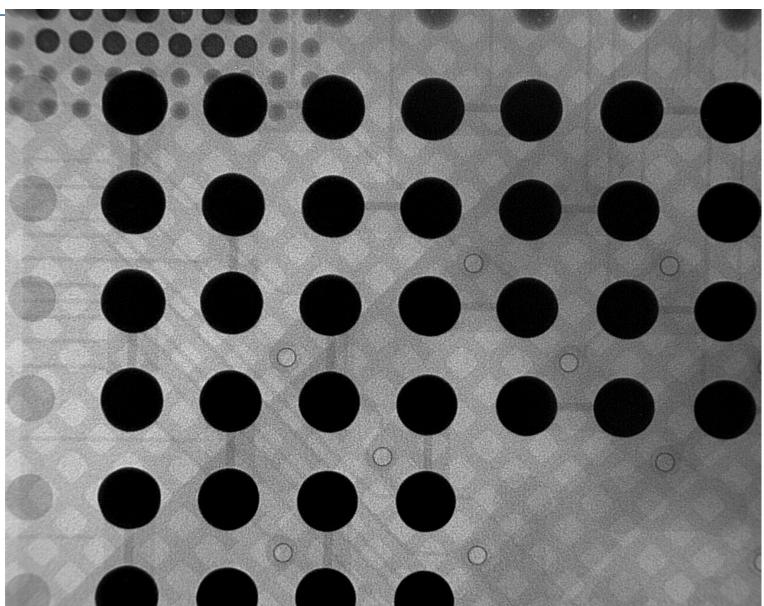






R+R 29 / Z - X-Ray nach Rework 2 / Detail - BGA 256

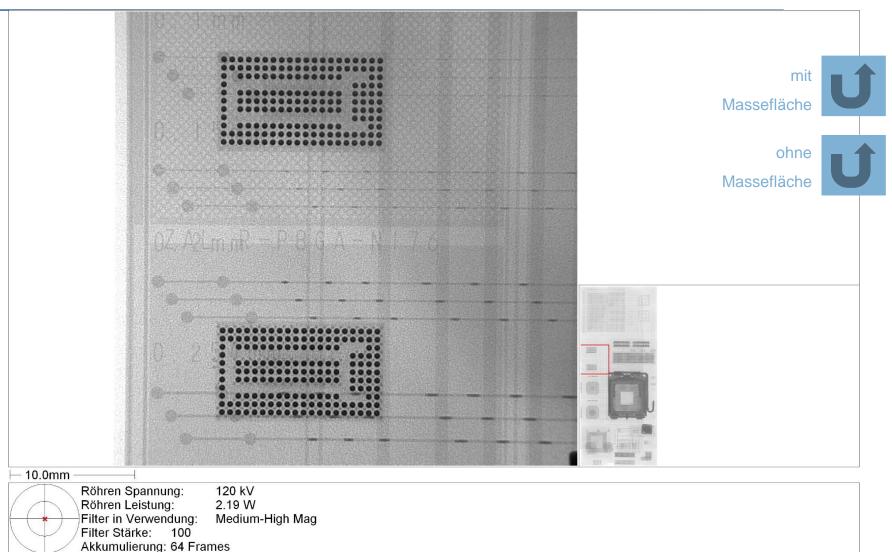






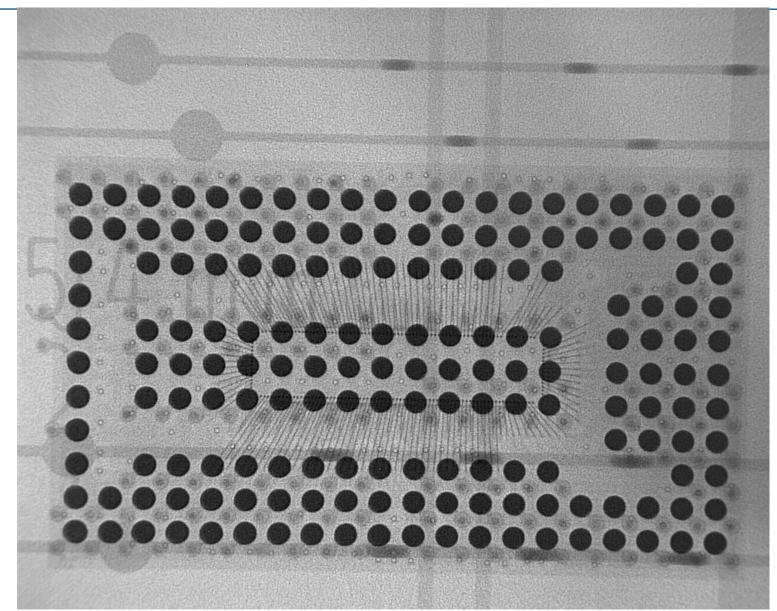
R+R 29 / Z – X-Ray vor Rework – ZAL R-PBGA-N176





R+R 29 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (mit Massefläche)

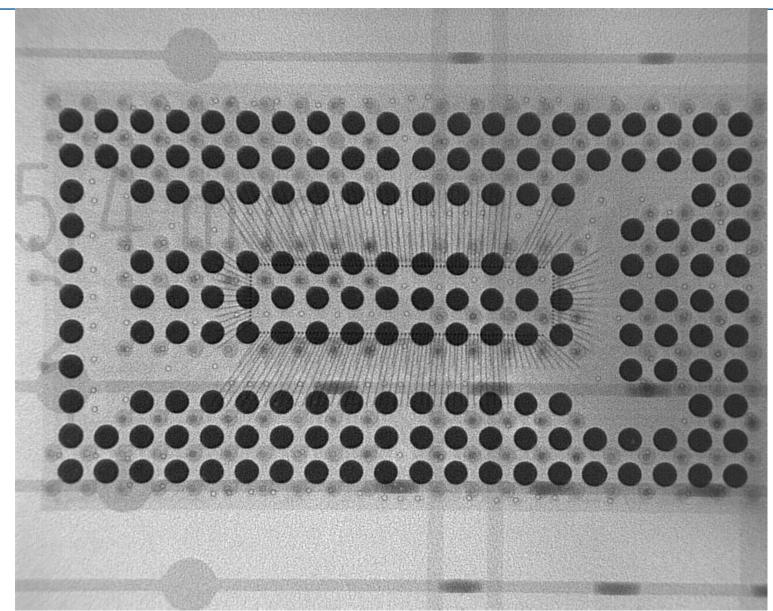






R+R 29 / Z – X-Ray nach Rework 2 – ZAL R-PBGA-N176 (mit Massefläche)

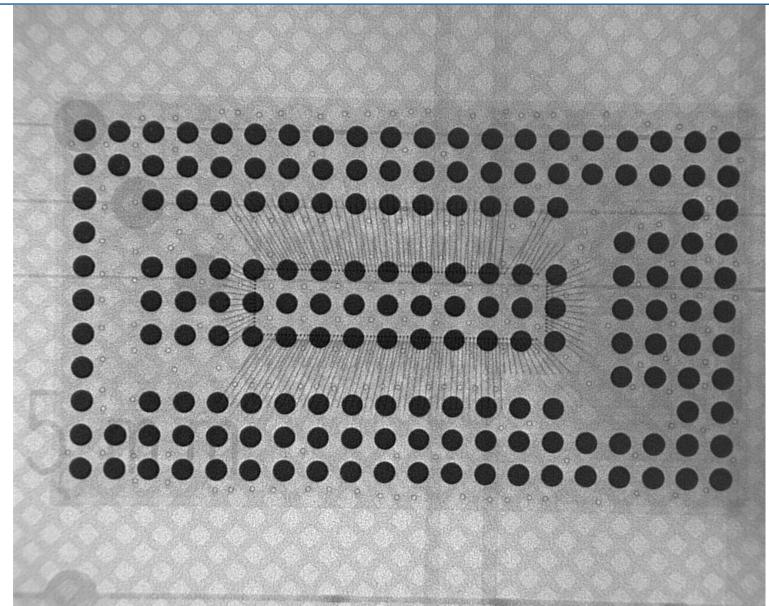






R+R 29 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (ohne Massefläche)







R+R 29 / Z – Padablöser bei Rework 2 – ZAL R-PBGA-N176 (ohne Massefläche)

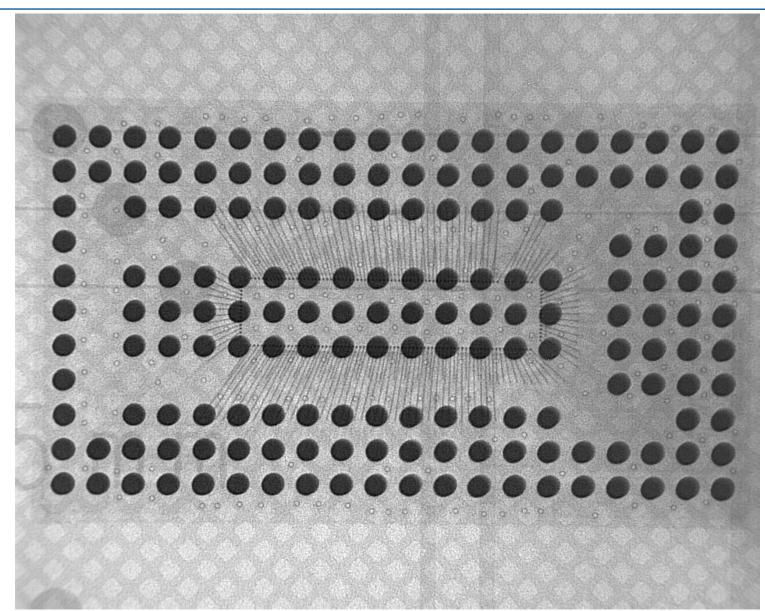






R+R 29 / Z – X-Ray nach Rework 2 – ZAL R-PBGA-N176 (ohne Massefläche)

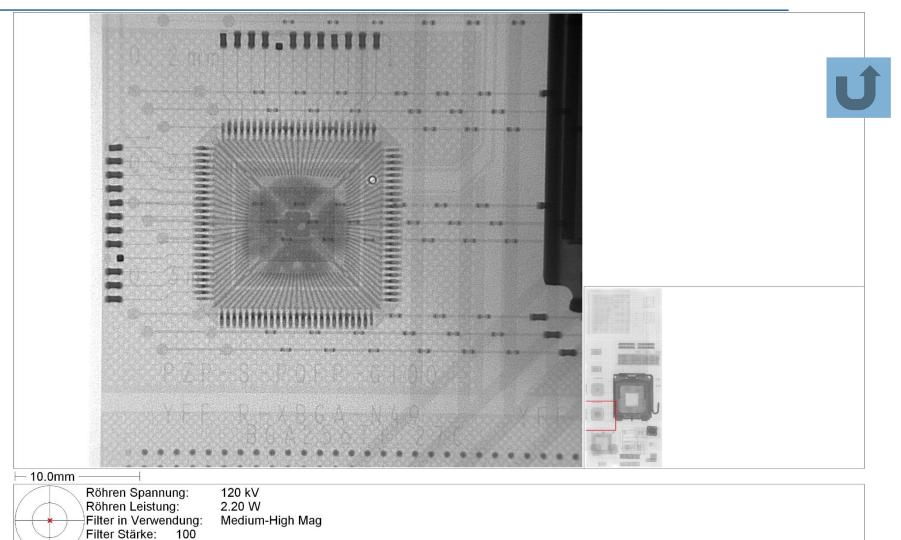






R+R 29 / Z - X-Ray vor Rework - PZP-S-PQFP-G100

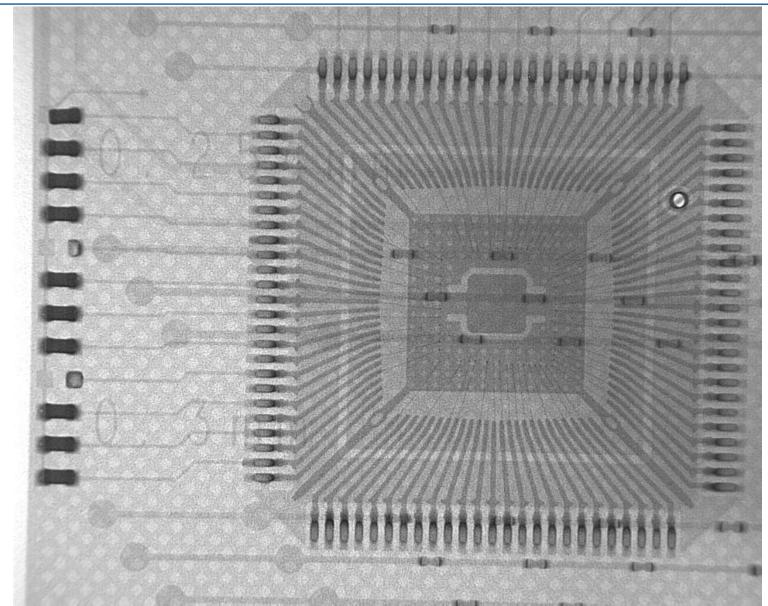




Akkumulierung: 64 Frames

R+R 29 / Z – X-Ray nach Rework 1 – PZP-S-PQFP-G100

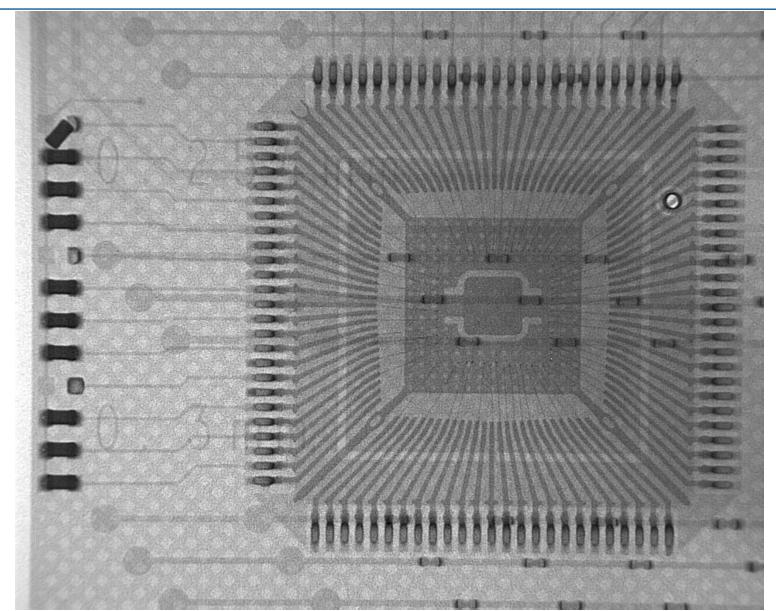






R+R 29 / Z – X-Ray nach Rework 2 – PZP-S-PQFP-G100

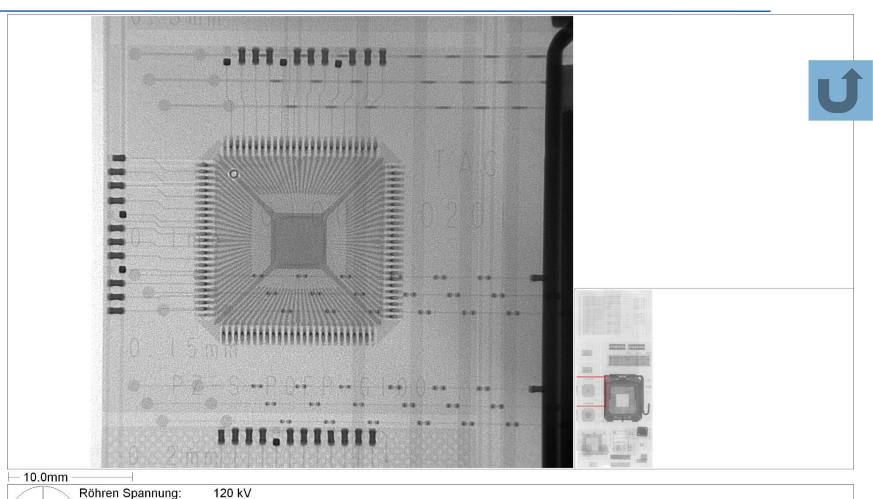






R+R 29 / Z – X-Ray vor Rework – PZ-S-PQFP-G100





PCB and Electronic Systems – Rework elektronischer Baugruppen

Röhren Leistung:

Filter in Verwendung:

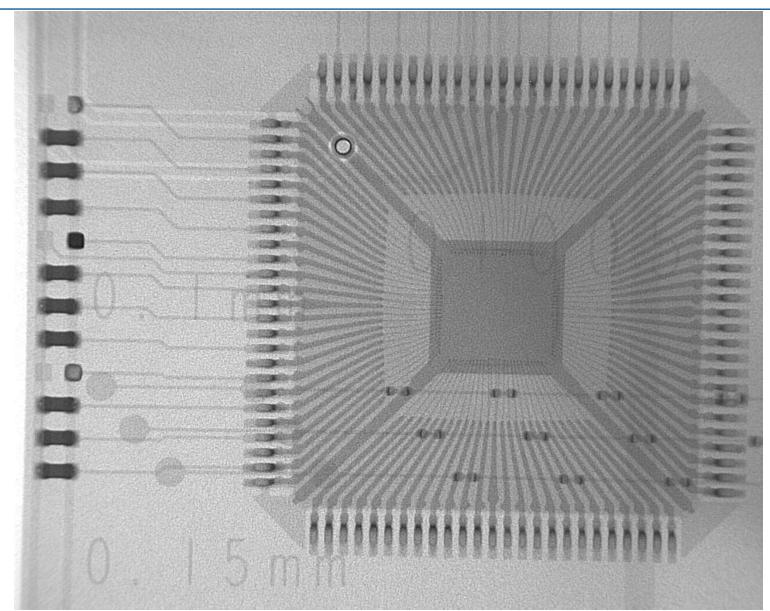
Filter Stärke: 100 Akkumulierung: 64 Frames

2.19 W

Medium-High Mag

R+R 29 / Z - X-Ray nach Rework 1 - PZ-S-PQFP-G100

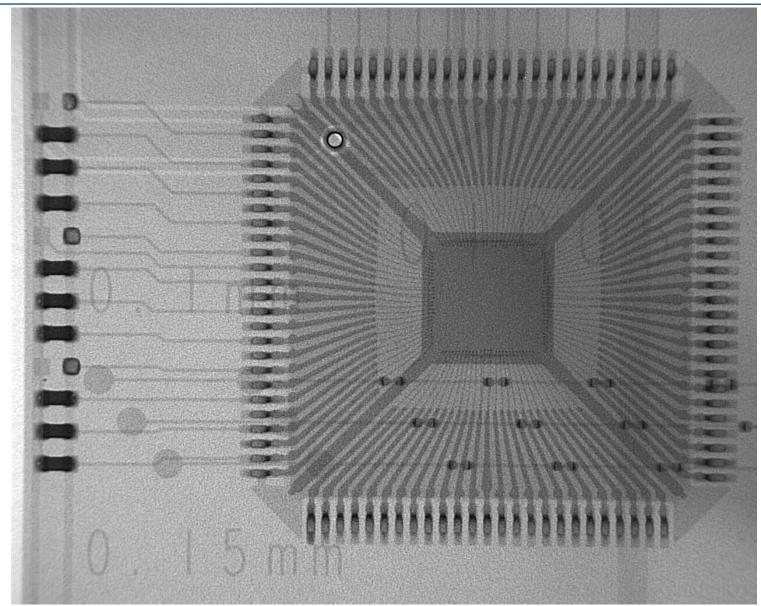






R+R 29 / Z - X-Ray nach Rework 2 - PZ-S-PQFP-G100





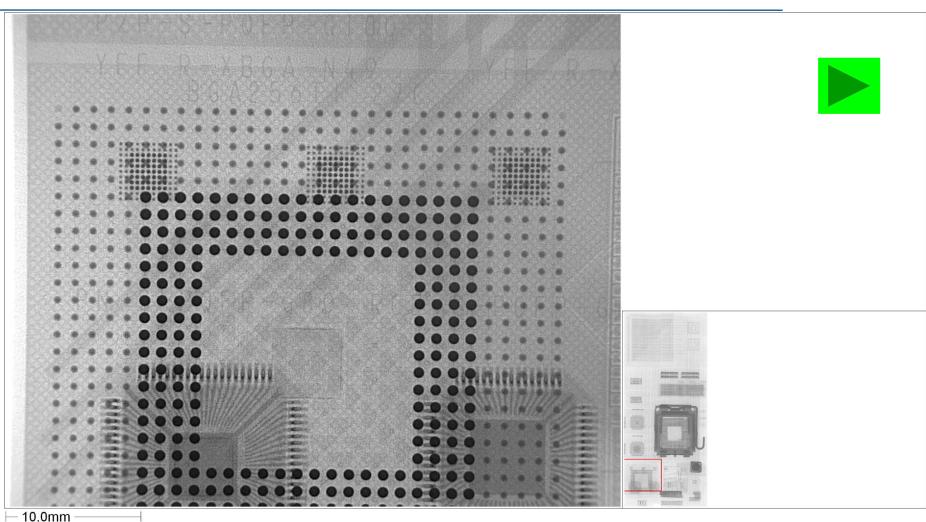




Baugruppe R+R 30 / Z

R+R 30 / Z - X-Ray vor Rework - BGA 256





PCB and Electronic Systems – Rework elektronischer Baugruppen

Filter Stärke:

Röhren Spannung:

Filter in Verwendung:

Akkumulierung: 64 Frames

Röhren Leistung:

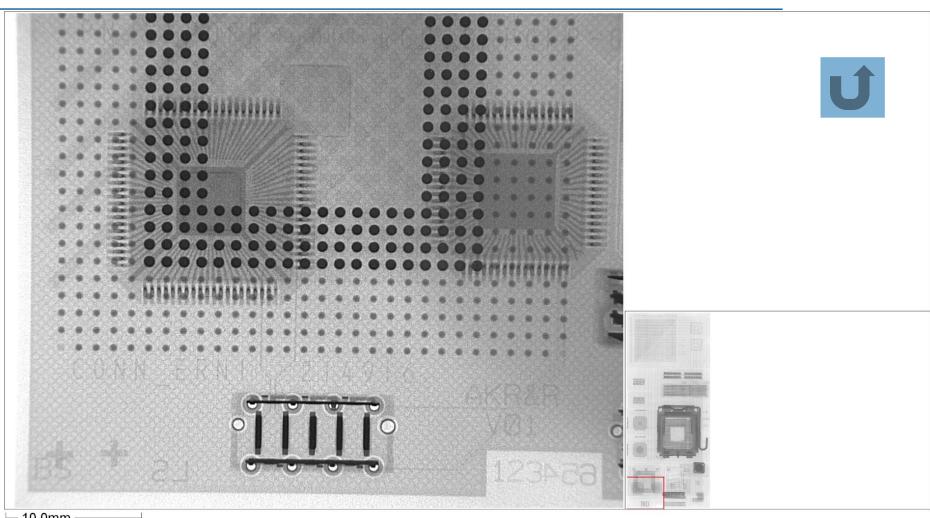
120 kV

2.20 W

Medium-High Mag

R+R 30 / Z – X-Ray vor Rework – BGA 256





10.0mm

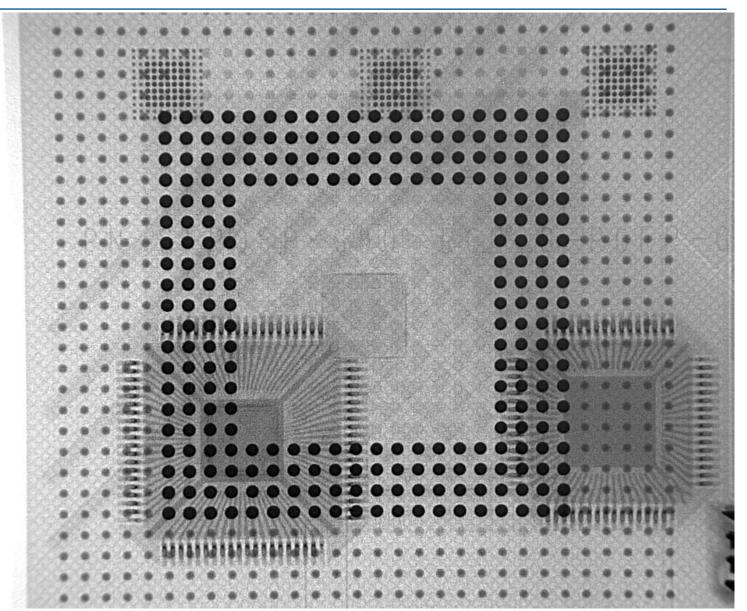
Röhren Spannung: 120 kV Röhren Leistung: 2.20 W

Filter in Verwendung: Medium-High Mag

Filter Stärke: Akkumulierung: 64 Frames

R+R 30 / Z - X-Ray nach Rework 1 - BGA 256

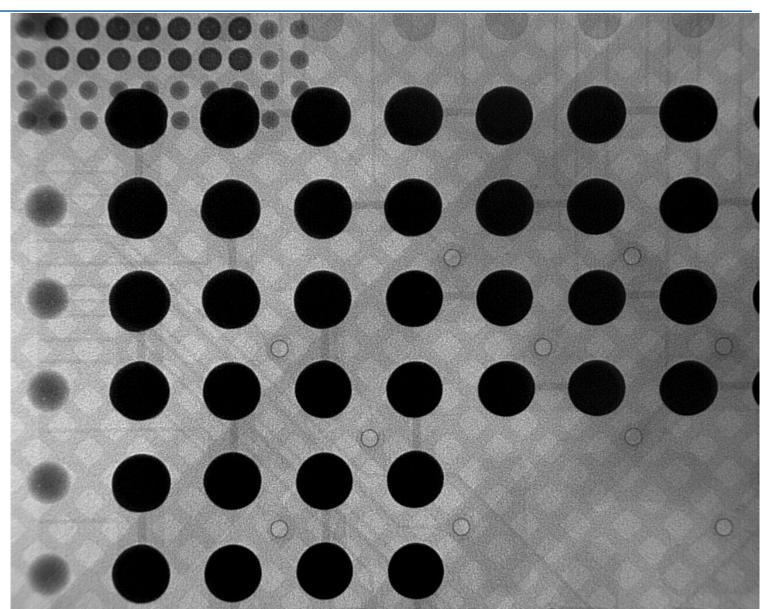






R+R 30 / Z - X-Ray nach Rework 1 / Detail - BGA 256

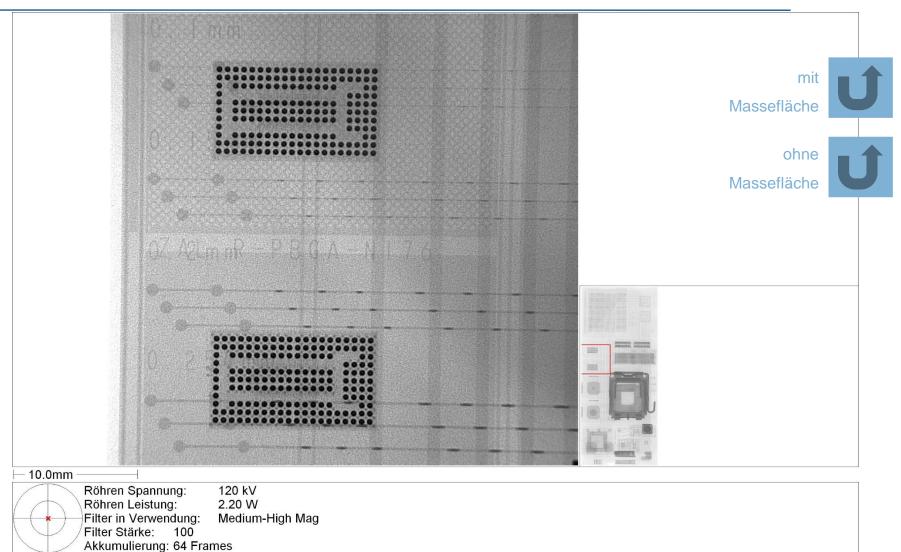






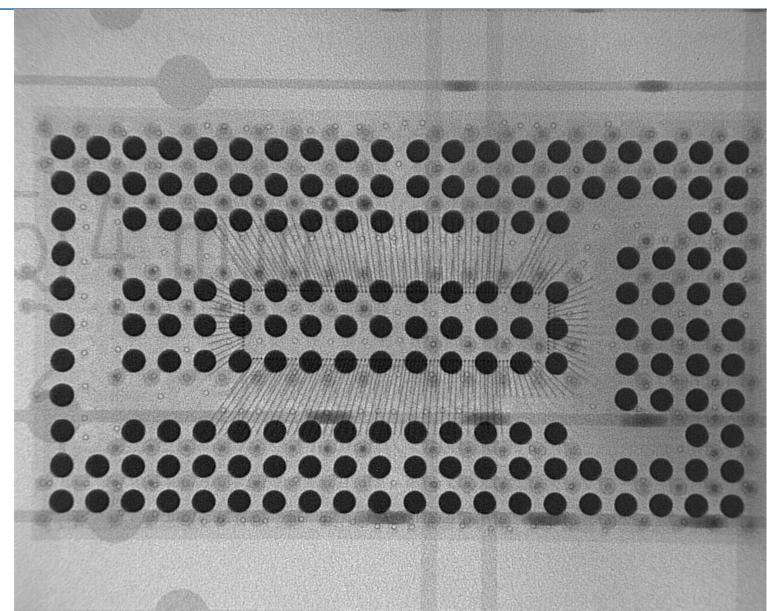
R+R 30 / Z – X-Ray vor Rework – ZAL R-PBGA-N176





R+R 30 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (mit Massefläche)

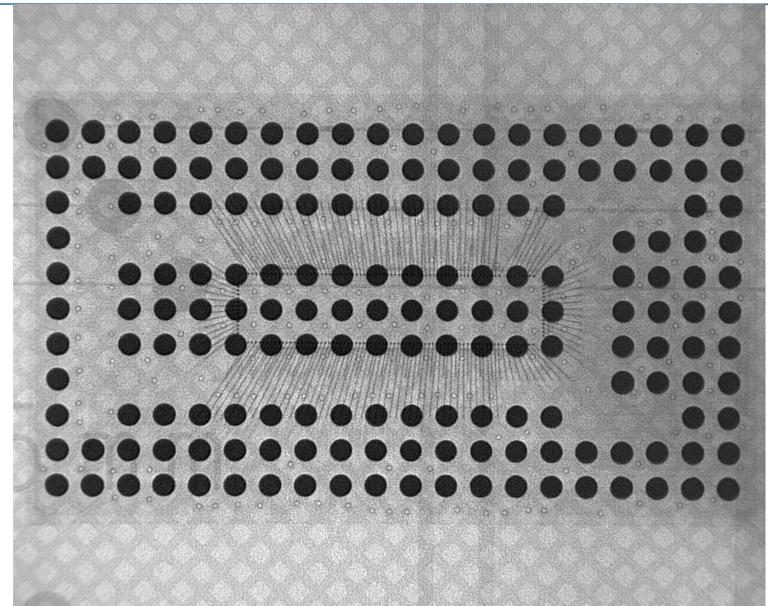






R+R 30 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (ohne Massefläche)

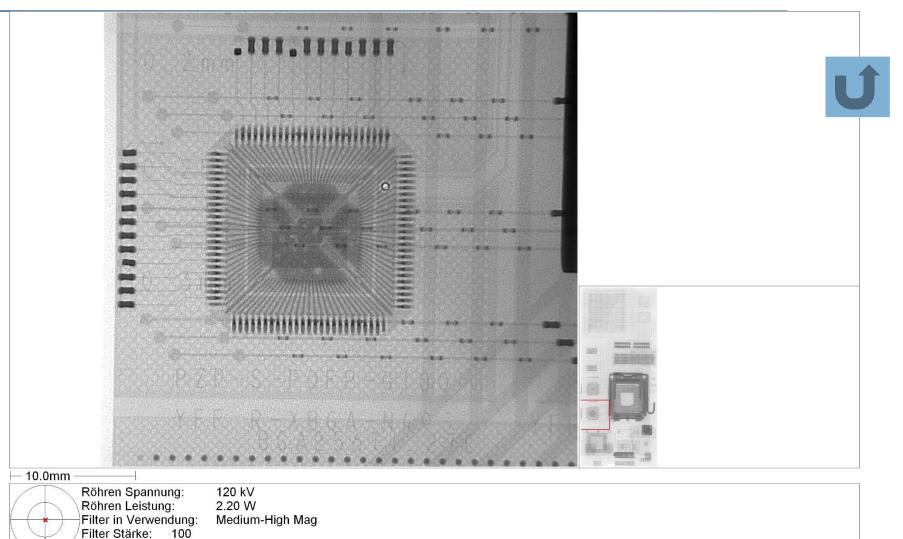






R+R 30 / Z - X-Ray vor Rework - PZP-S-PQFP-G100

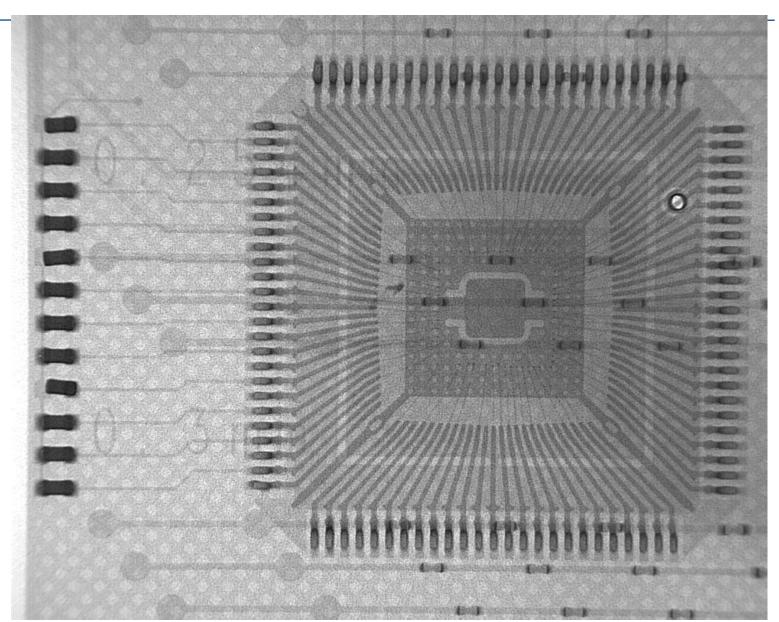




Akkumulierung: 64 Frames

R+R 30 / Z – X-Ray nach Rework 1 – PZP-S-PQFP-G100

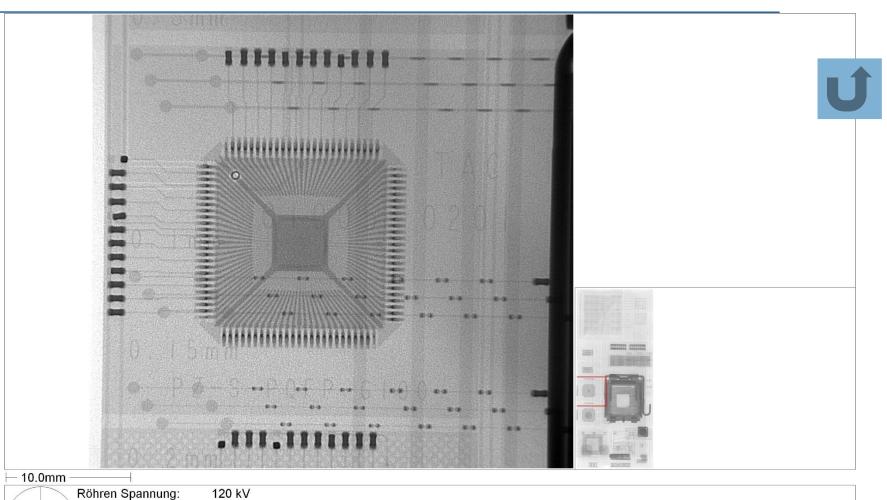






R+R 30 / Z - X-Ray vor Rework - PZ-S-PQFP-G100





PCB and Electronic Systems – Rework elektronischer Baugruppen

Röhren Leistung: Filter in Verwendung:

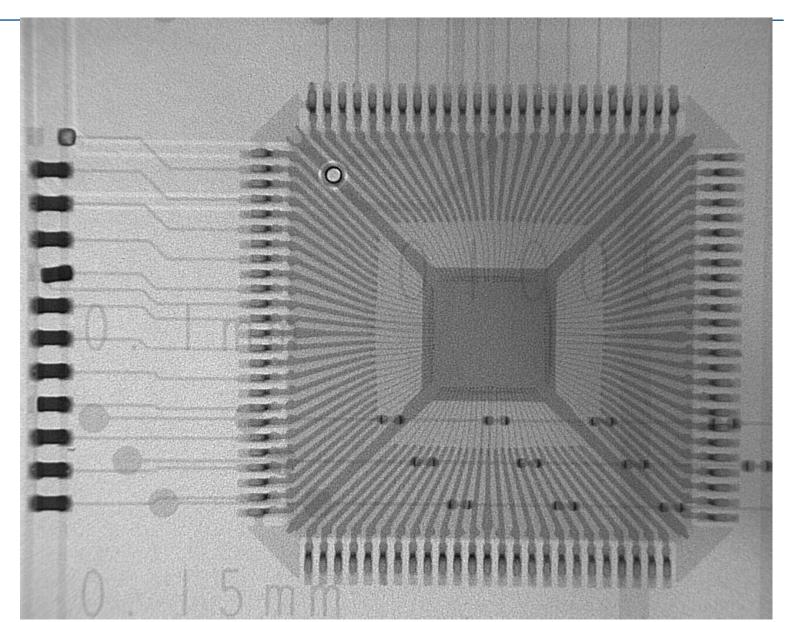
Filter Stärke: 100 Akkumulierung: 64 Frames

2.21 W

Medium-High Mag

R+R 30 / Z - X-Ray nach Rework 1 - PZ-S-PQFP-G100





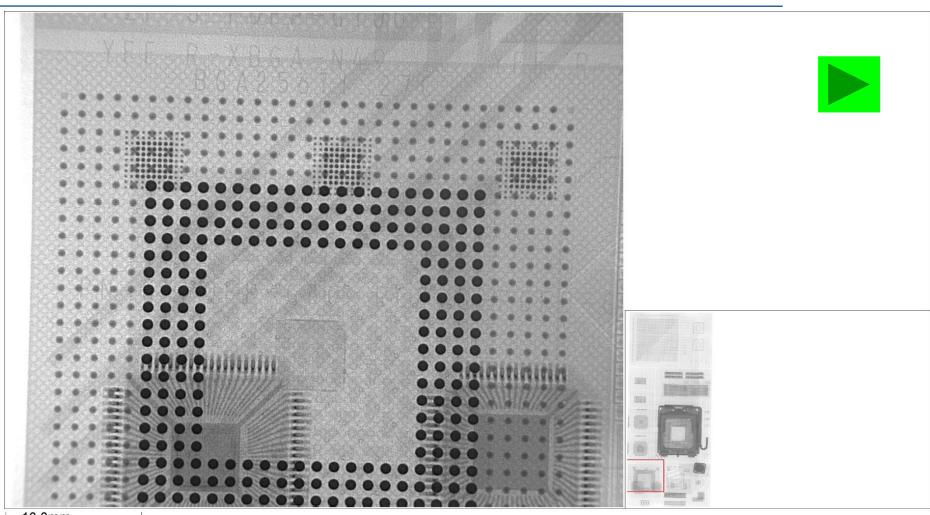




Baugruppe R+R 31 / Z

R+R 31 / Z – X-Ray vor Rework – BGA 256





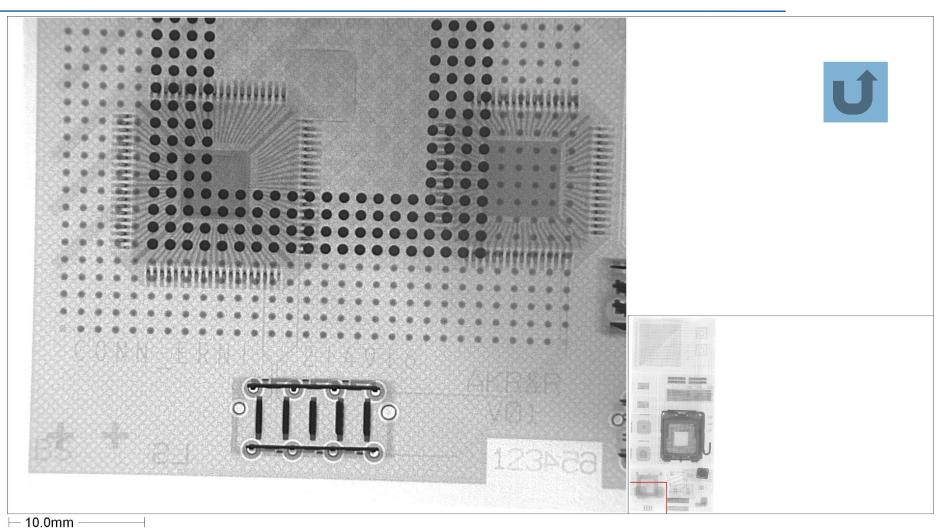
- 10.0mm

Röhren Spannung: 120 kV
Röhren Leistung: 2.19 W
Filter in Verwendung: Medium-High Mag

Filter Stärke: 100 Akkumulierung: 64 Frames

R+R 31 / Z – X-Ray vor Rework – BGA 256





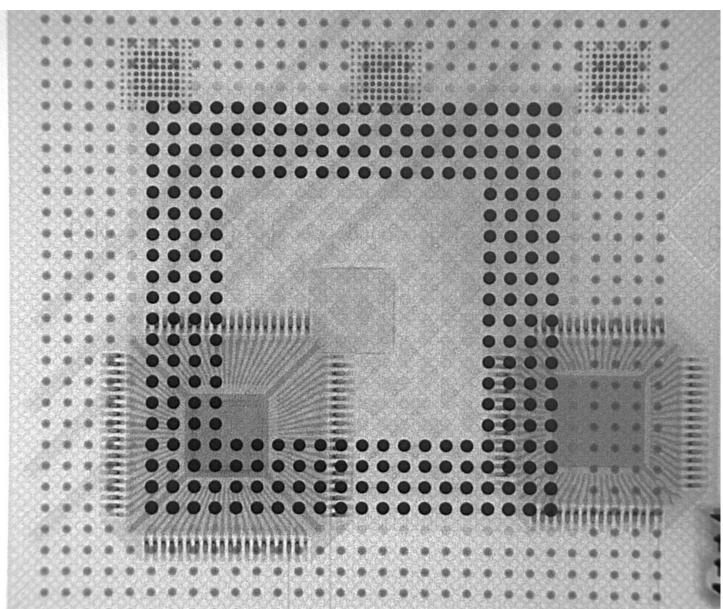
Röhren Spannung: 120 kV Röhren Leistung: 2.19 W

Filter in Verwendung: Medium-High Mag

Filter Stärke: 100 Akkumulierung: 64 Frames

R+R 31 / Z - X-Ray nach Rework 1 - BGA 256

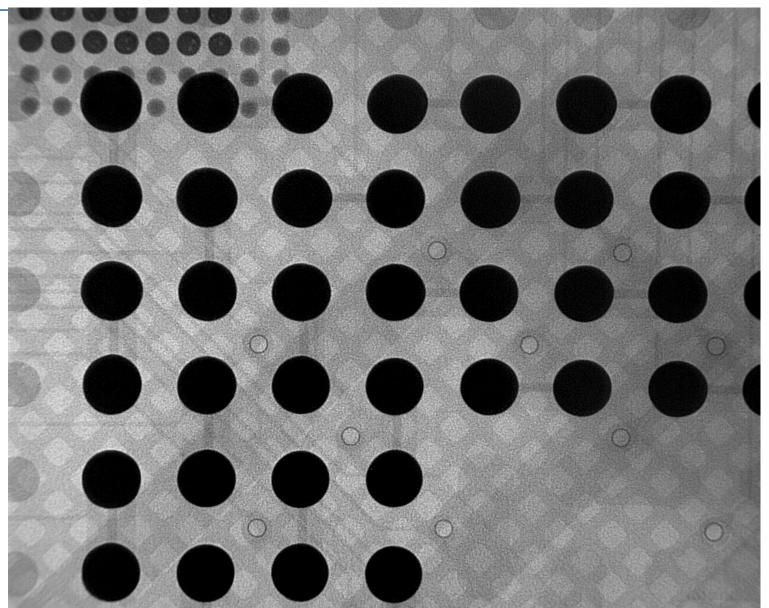






R+R 31 / Z - X-Ray nach Rework 1 / Detail - BGA 256

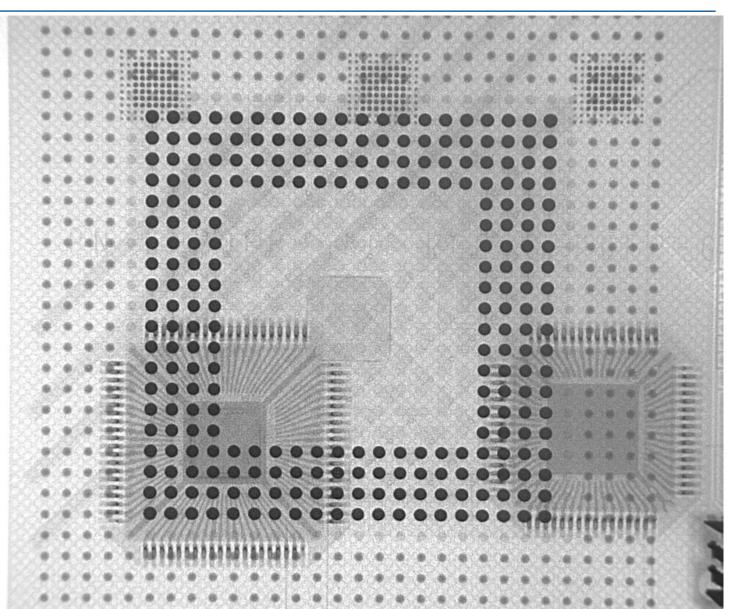






R+R 31 / Z - X-Ray nach Rework 2 - BGA 256

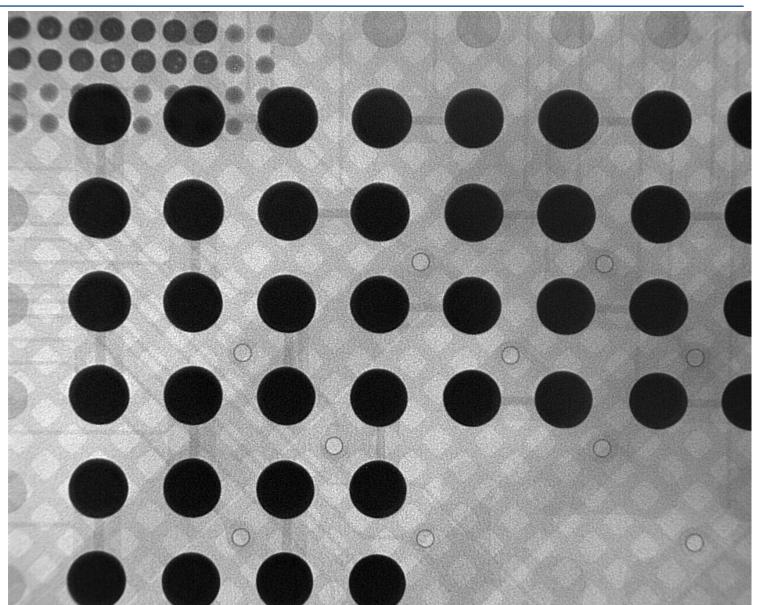






R+R 31 / Z - X-Ray nach Rework 2 / Detail - BGA 256

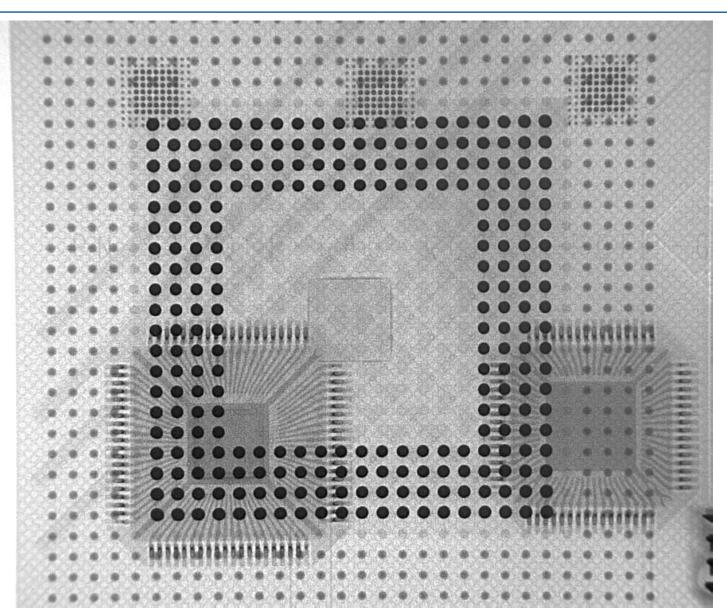






R+R 31 / Z - X-Ray nach Rework 3 - BGA 256

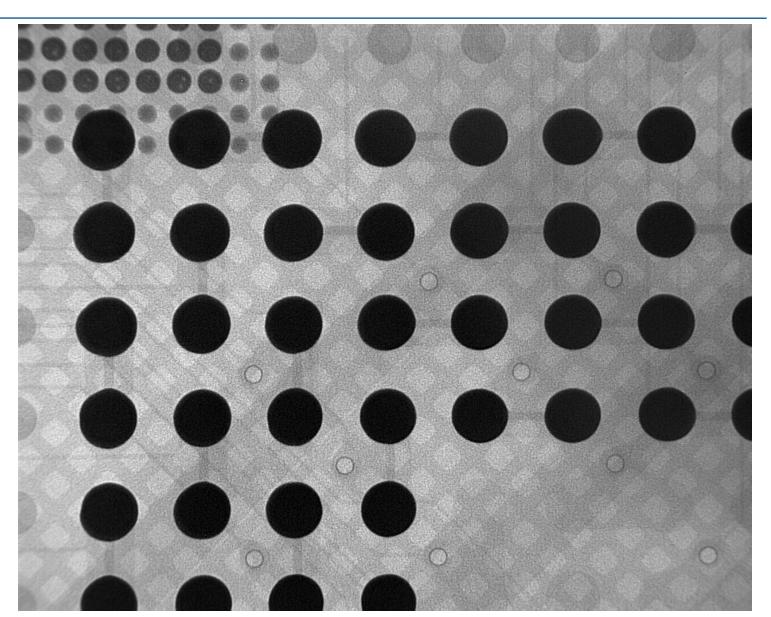






R+R 31 / Z - X-Ray nach Rework 3 / Detail - BGA 256

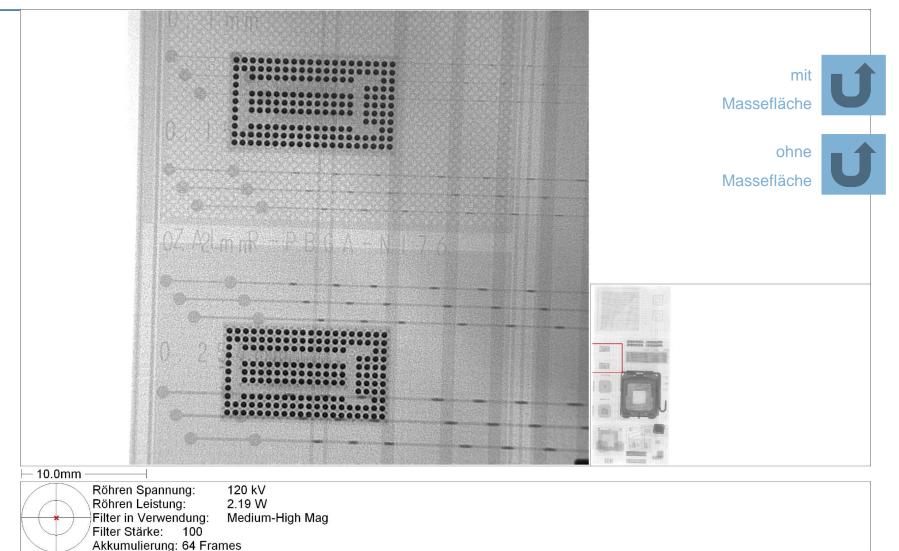






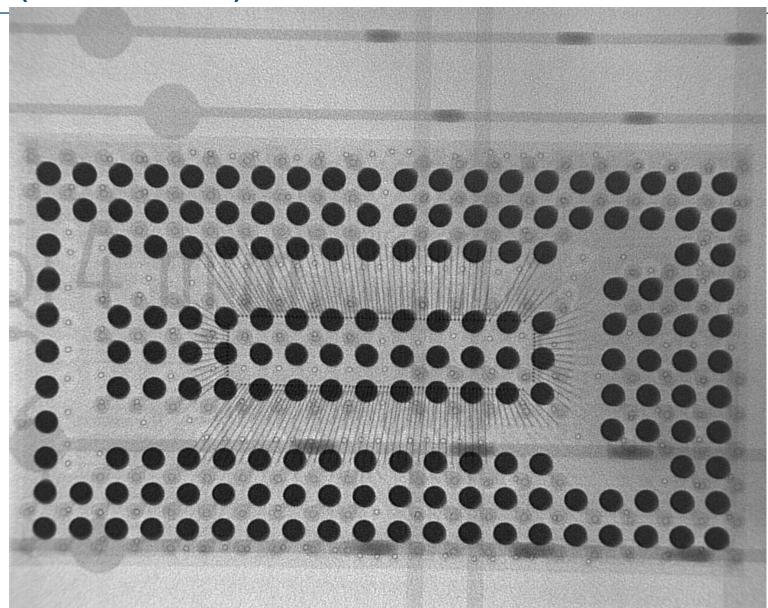
R+R 31 / Z – X-Ray vor Rework – ZAL R-PBGA-N176





R+R 31 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (mit Massefläche)

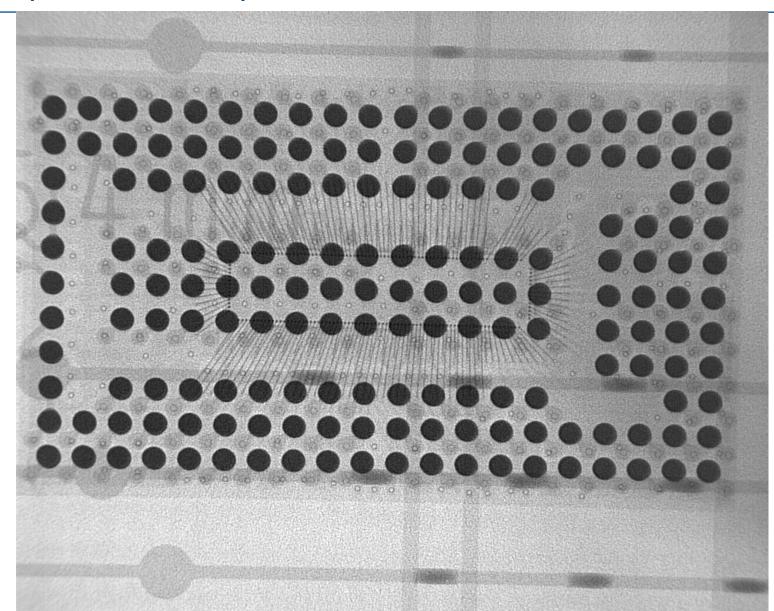






R+R 31 / Z – X-Ray nach Rework 2 – ZAL R-PBGA-N176 (mit Massefläche)

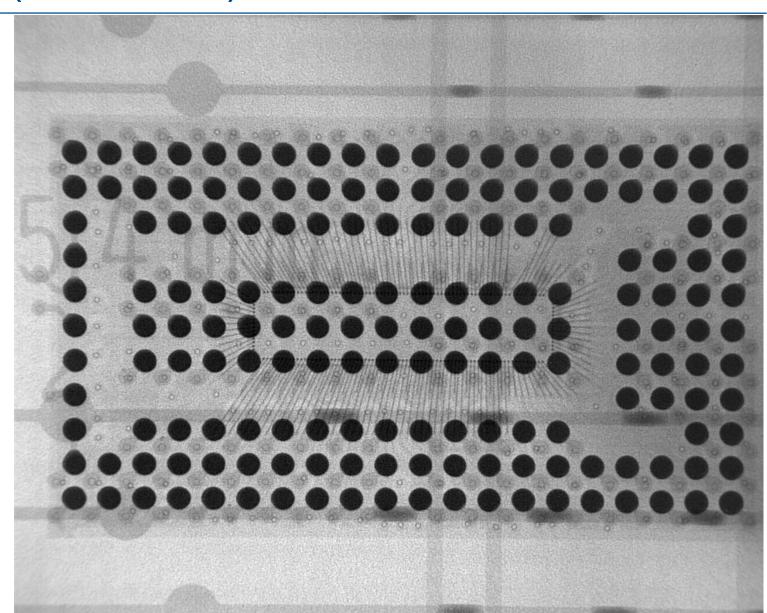






R+R 31 / Z – X-Ray nach Rework 3 – ZAL R-PBGA-N176 (mit Massefläche)

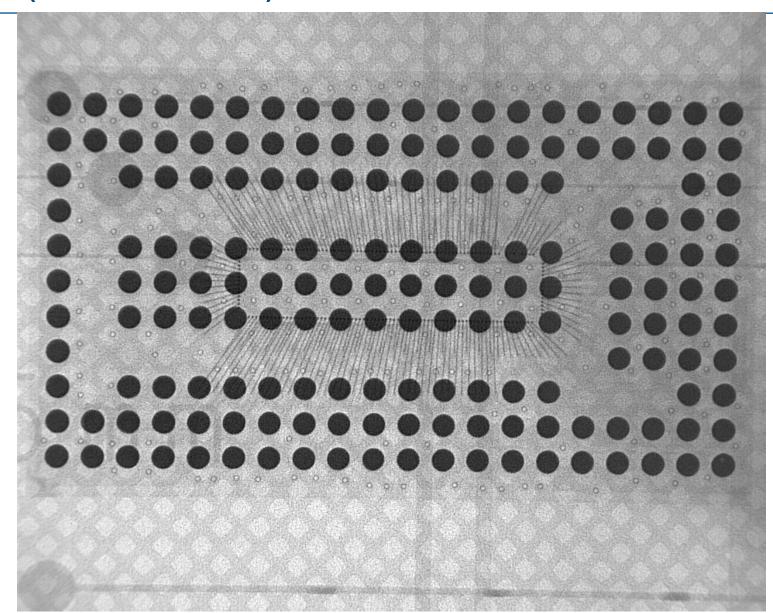






R+R 31 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (ohne Massefläche)

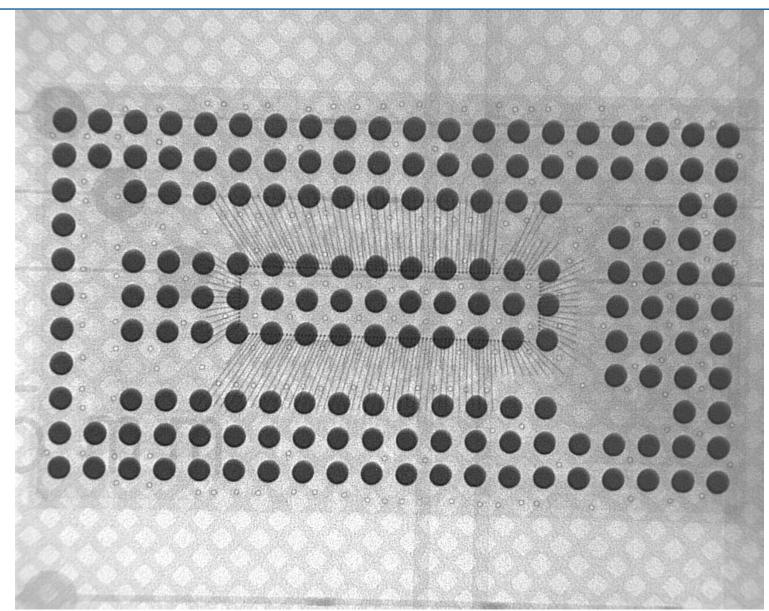






R+R 31 / Z – X-Ray nach Rework 2 – ZAL R-PBGA-N176 (ohne Massefläche)

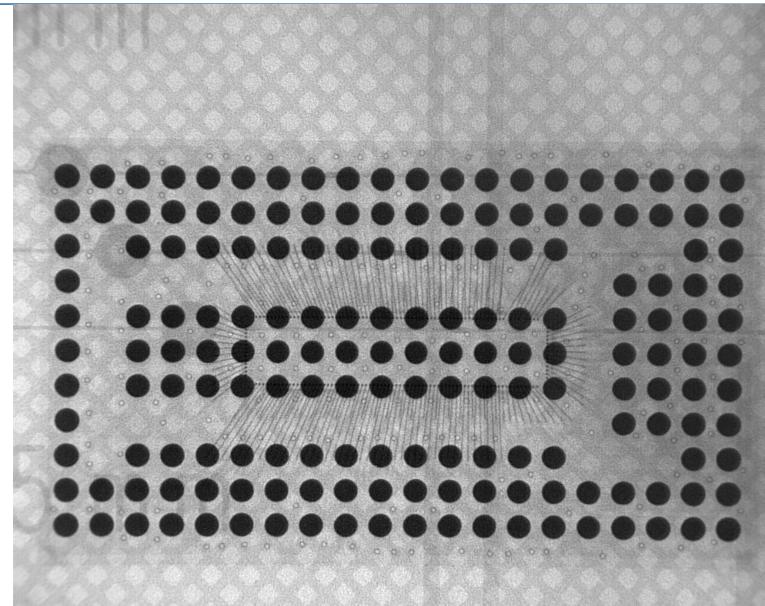






R+R 31 / Z – X-Ray nach Rework 3 – ZAL R-PBGA-N176 (ohne Massefläche)

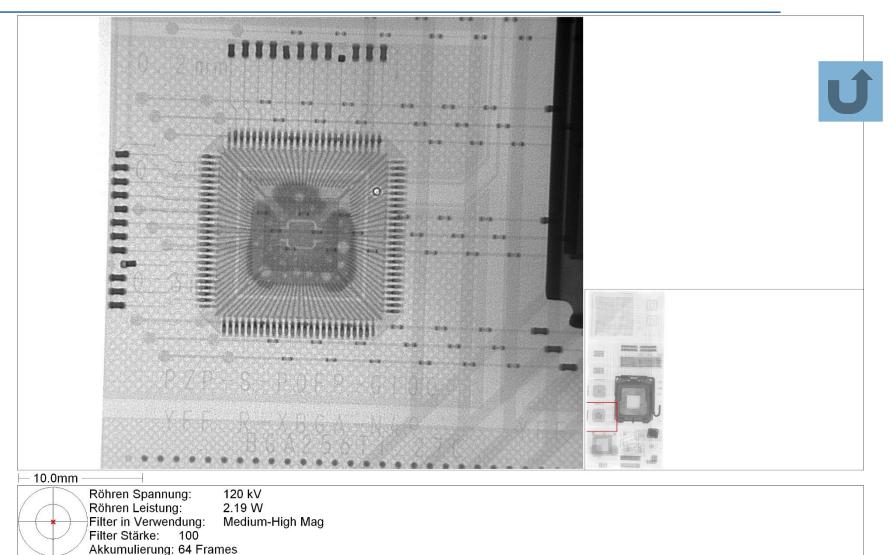






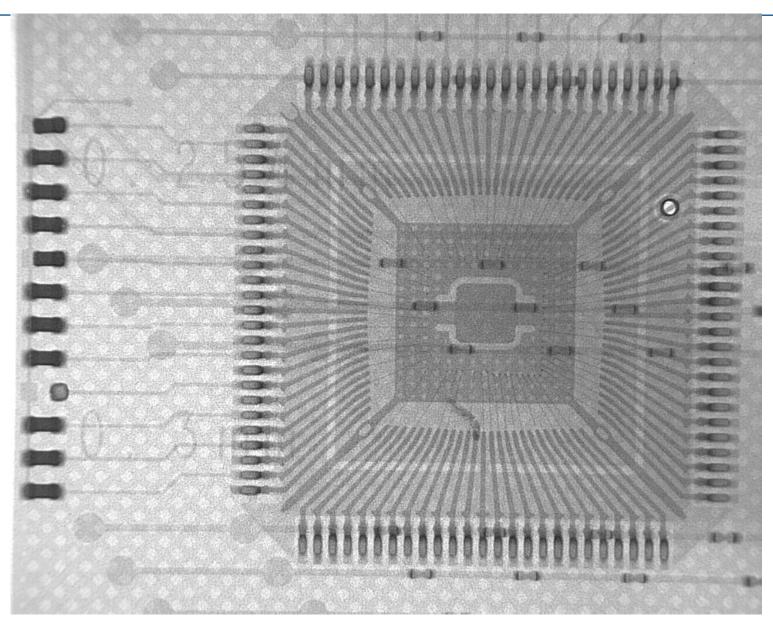
R+R 31 / Z - X-Ray vor Rework - PZP-S-PQFP-G100





R+R 31 / Z – X-Ray nach Rework 1 – PZP-S-PQFP-G100

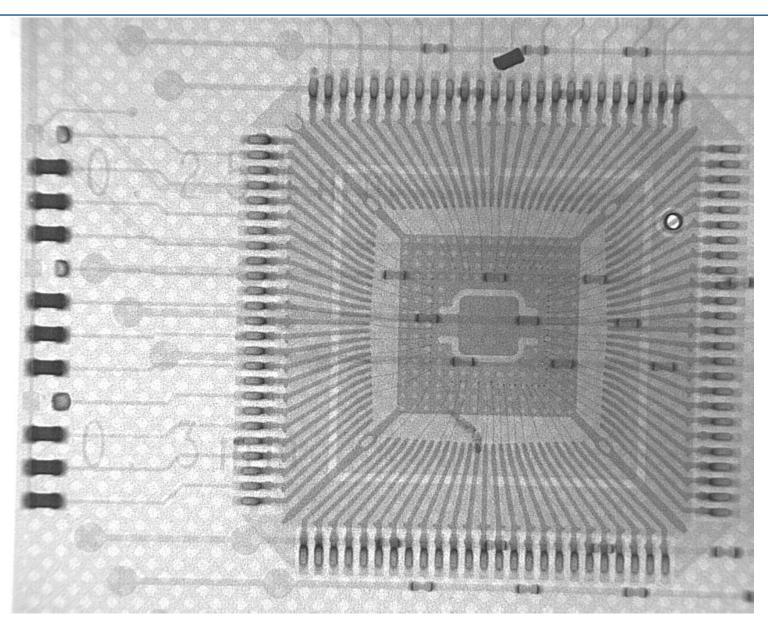






R+R 31 / Z – X-Ray nach Rework 2 – PZP-S-PQFP-G100

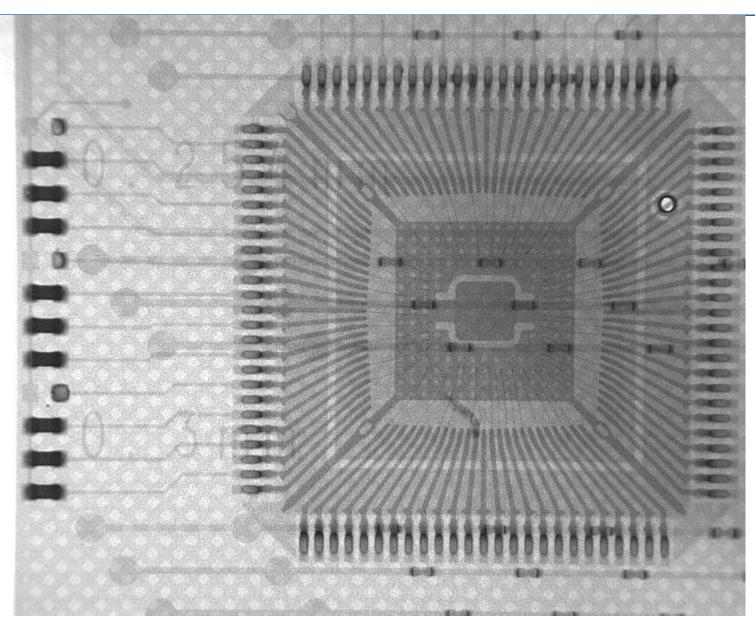






R+R 31 / Z – X-Ray nach Rework 3 – PZP-S-PQFP-G100

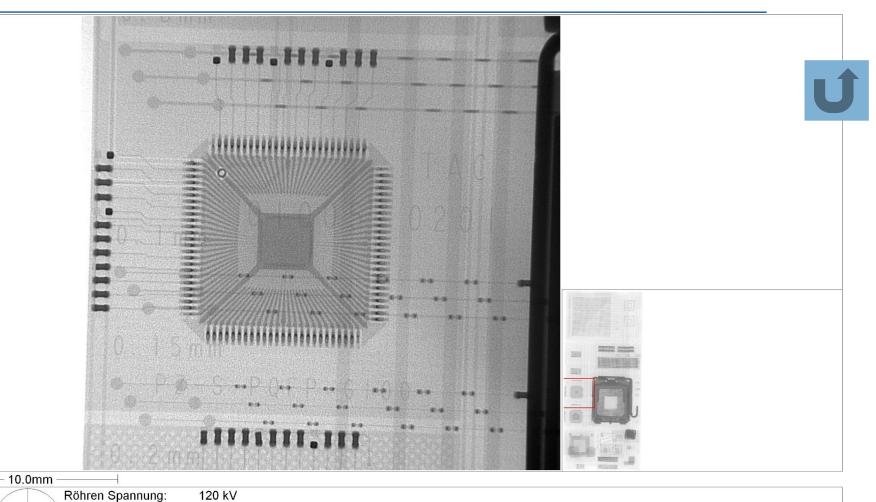






R+R 31 / Z - X-Ray vor Rework - PZ-S-PQFP-G100





Akkumulierung: 64 Frames

Röhren Leistung:

Filter in Verwendung:

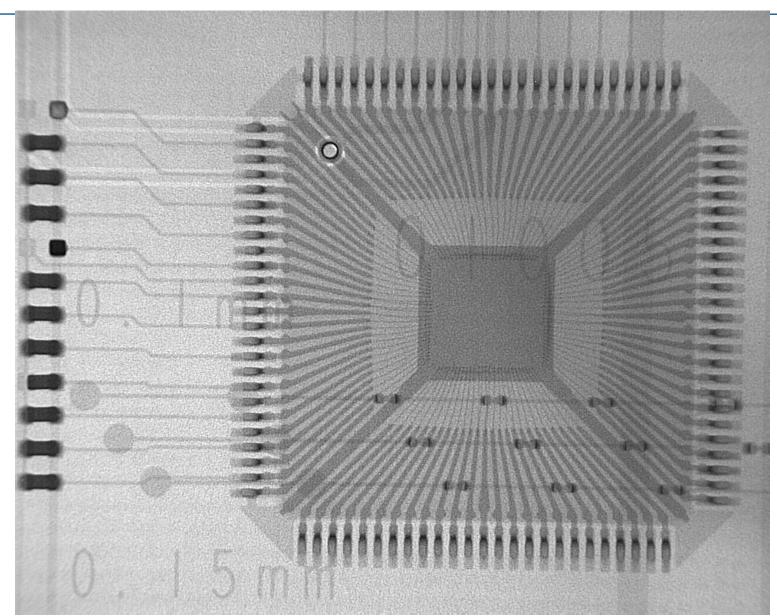
Filter Stärke: 100

2.19 W

Medium-High Mag

R+R 31 / Z - X-Ray nach Rework 1 - PZ-S-PQFP-G100

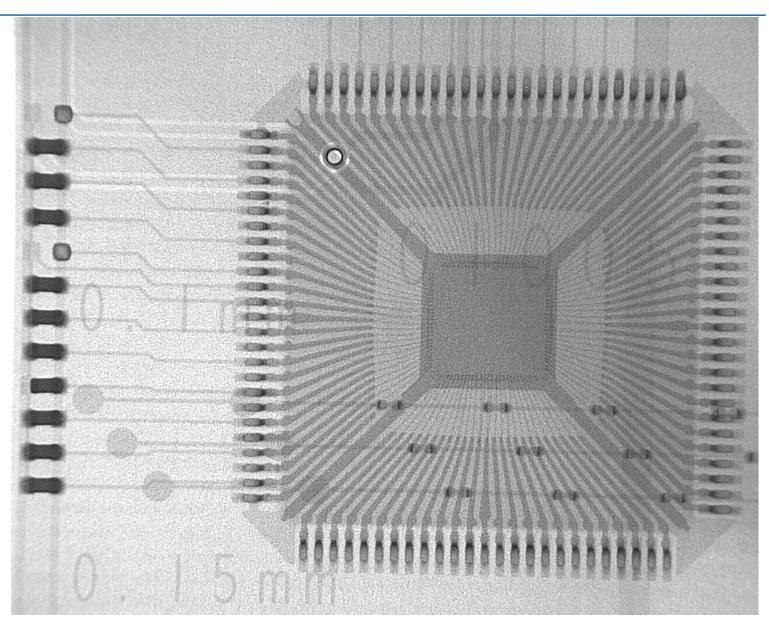






R+R 31 / Z - X-Ray nach Rework 2 - PZ-S-PQFP-G100

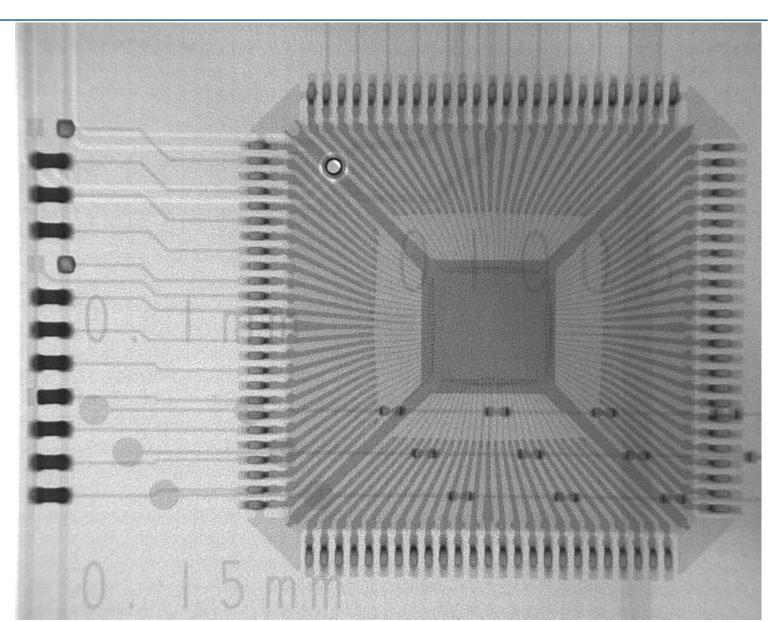






R+R 31 / Z - X-Ray nach Rework 3 - PZ-S-PQFP-G100





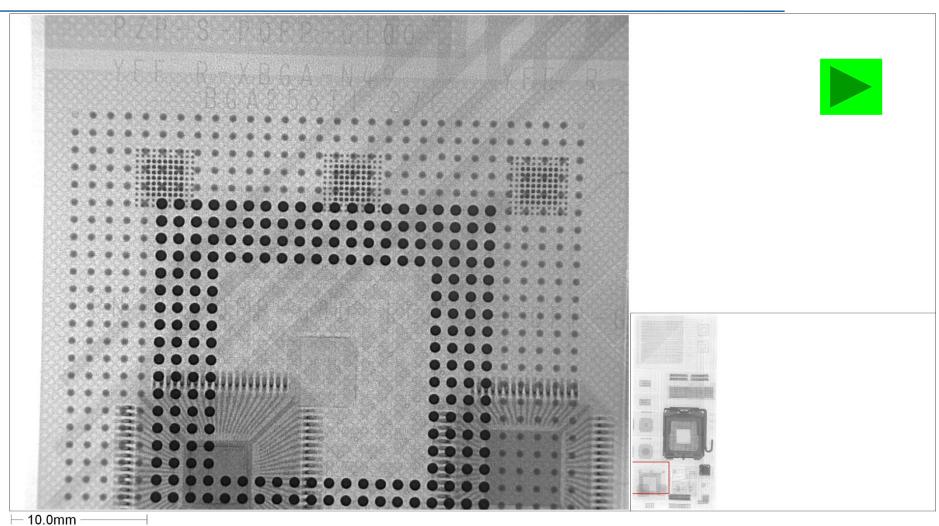




Baugruppe R+R 32 / Z

R+R 32 / Z – X-Ray vor Rework – BGA 256





PCB and Electronic Systems – Rework elektronischer Baugruppen

Filter Stärke:

Röhren Spannung:

Filter in Verwendung:

Akkumulierung: 64 Frames

Röhren Leistung:

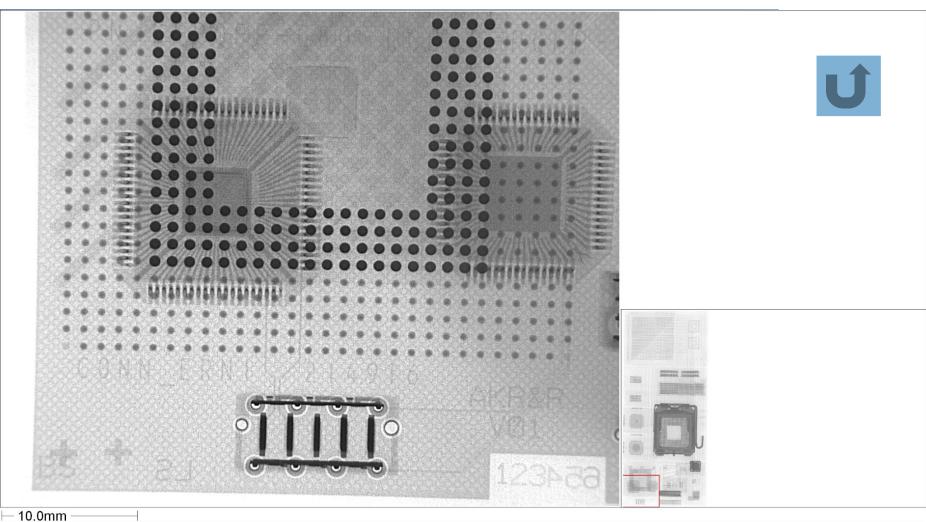
120 kV

2.19 W

Medium-High Mag

R+R 32 / Z - X-Ray vor Rework - BGA 256





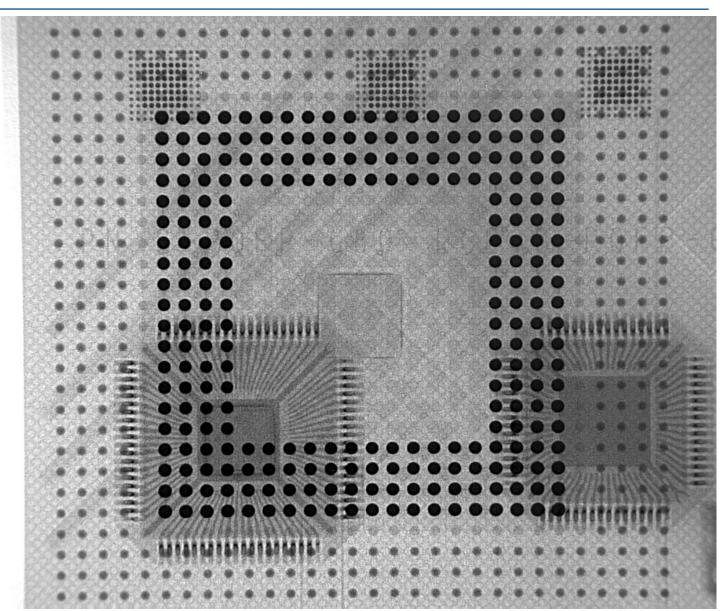
Röhren Spannung: 120 kV Röhren Leistung: 2.19 W

Filter in Verwendung: Medium-High Mag

Filter Stärke: 100 Akkumulierung: 64 Frames

R+R 32 / Z - X-Ray nach Rework 1 - BGA 256

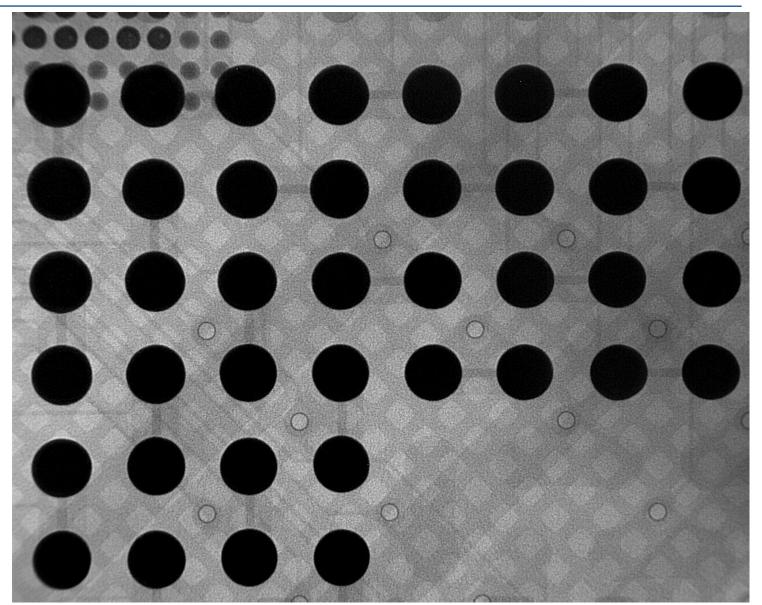






R+R 32 / Z - X-Ray nach Rework 1 / Detail - BGA 256

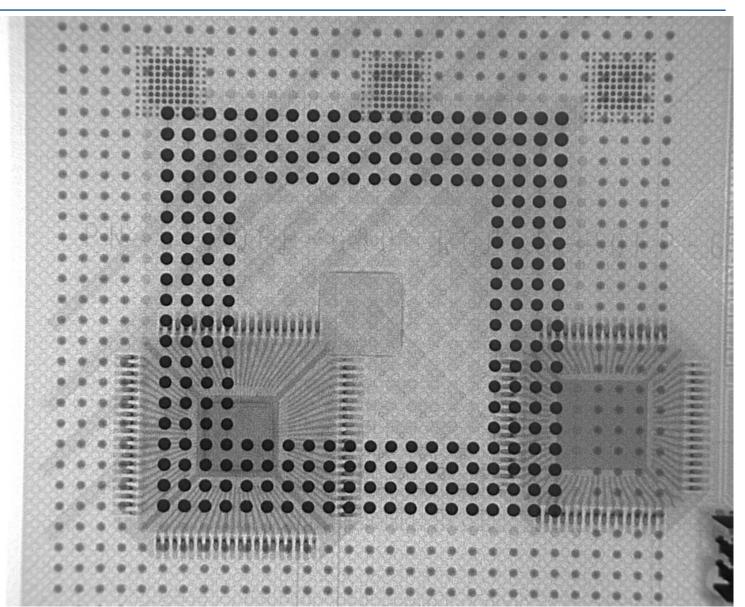






R+R 32 / Z - X-Ray nach Rework 2 - BGA 256

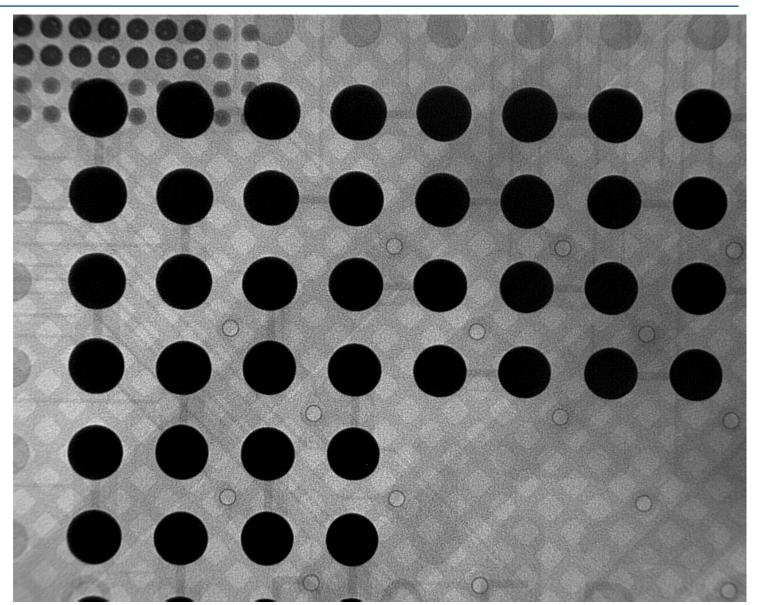






R+R 32 / Z - X-Ray nach Rework 2 / Detail - BGA 256

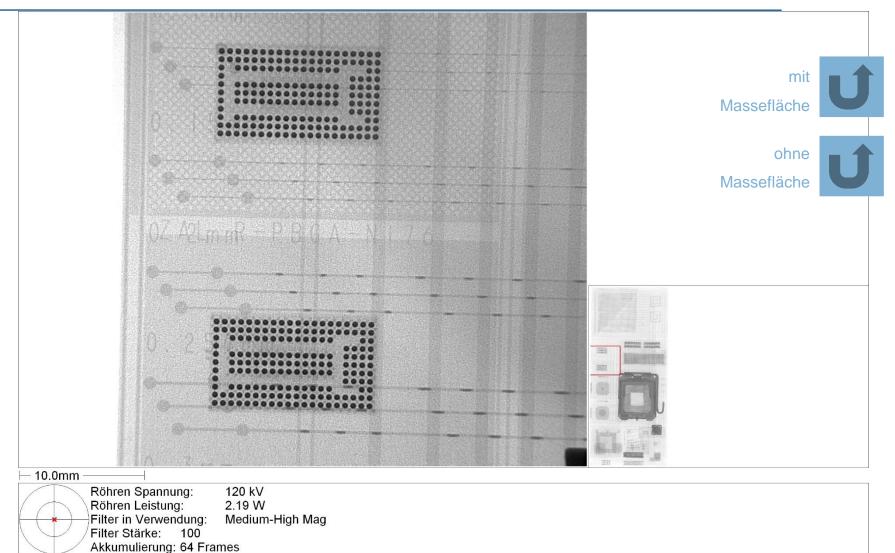






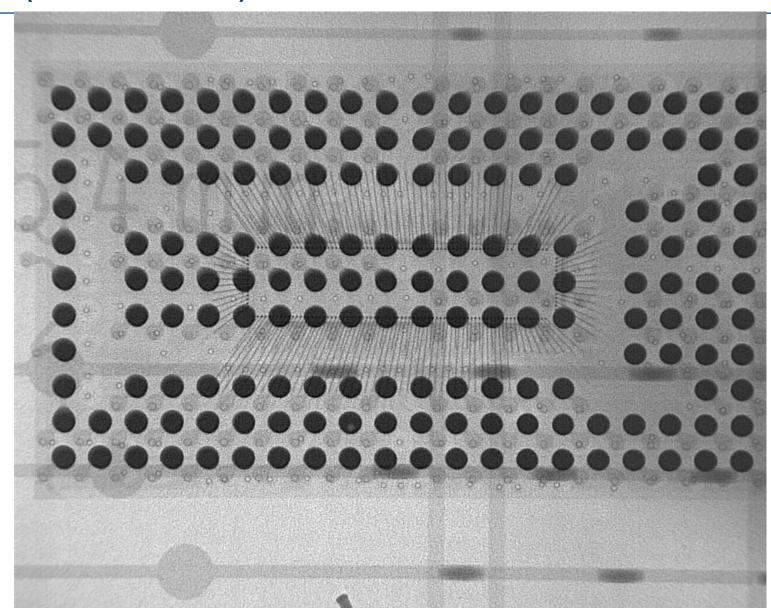
R+R 32 / Z – X-Ray vor Rework – ZAL R-PBGA-N176





R+R 32 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (mit Massefläche)

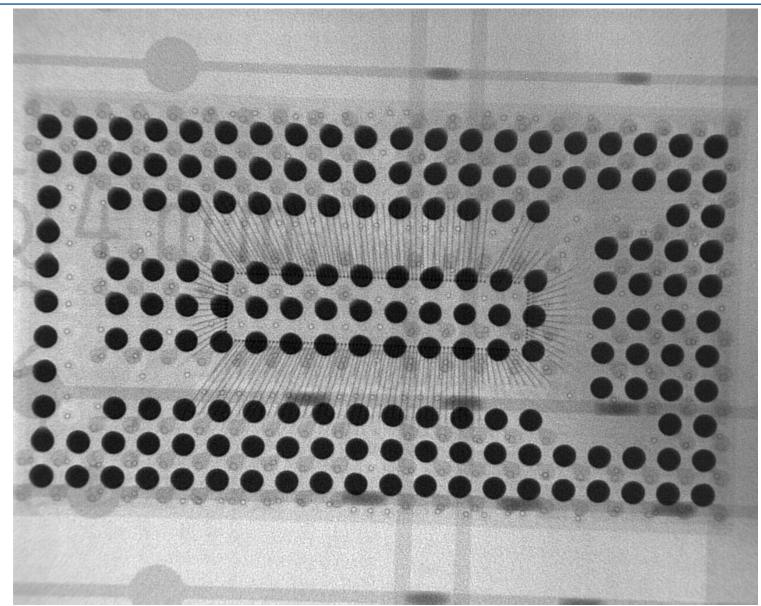






R+R 32 / Z – X-Ray nach Rework 2 – ZAL R-PBGA-N176 (mit Massefläche)

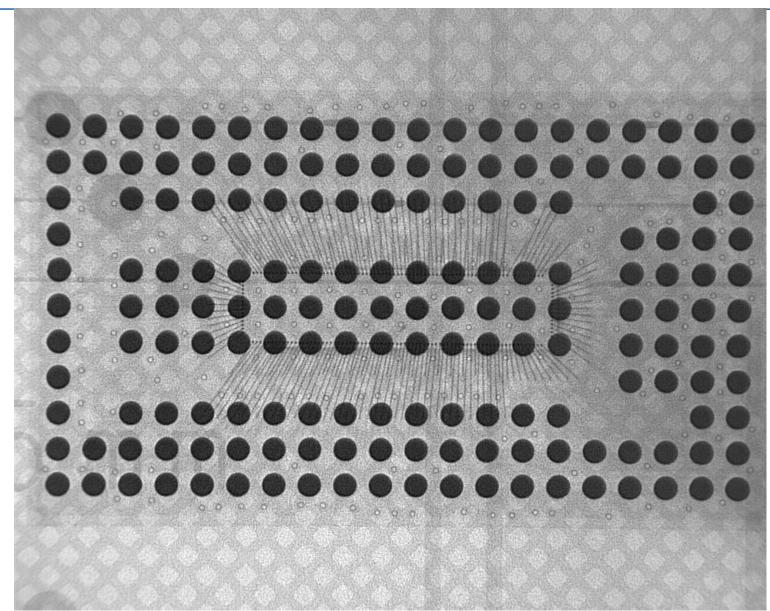






R+R 32 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (ohne Massefläche)

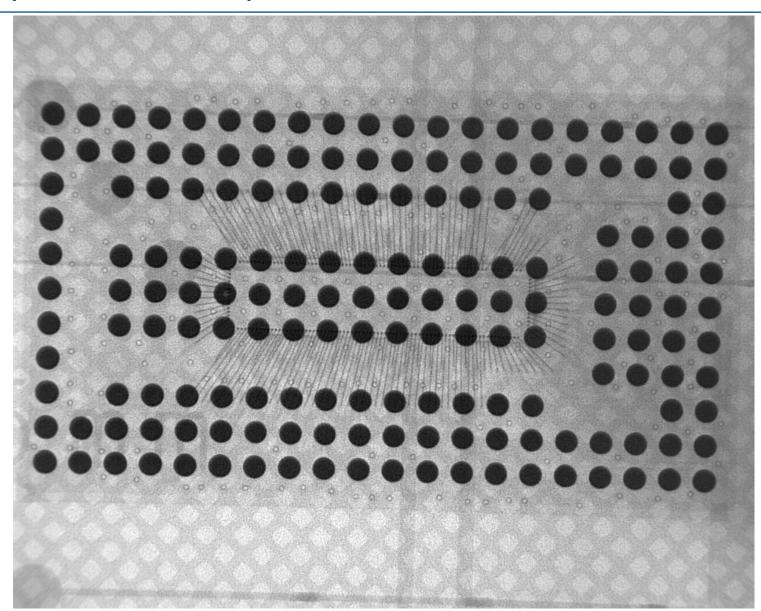






R+R 32 / Z – X-Ray nach Rework 2 – ZAL R-PBGA-N176 (ohne Massefläche)

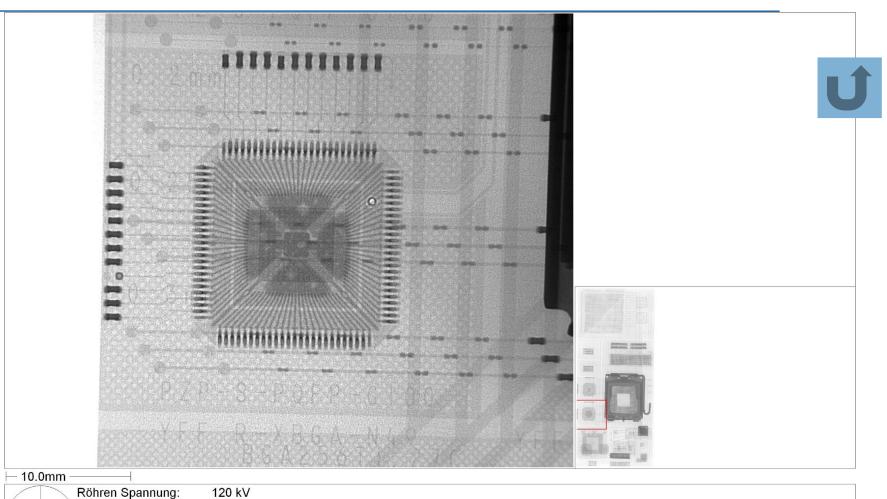






R+R 32 / Z - X-Ray vor Rework - PZP-S-PQFP-G100





Röhren Leistung: Filter in Verwendung:

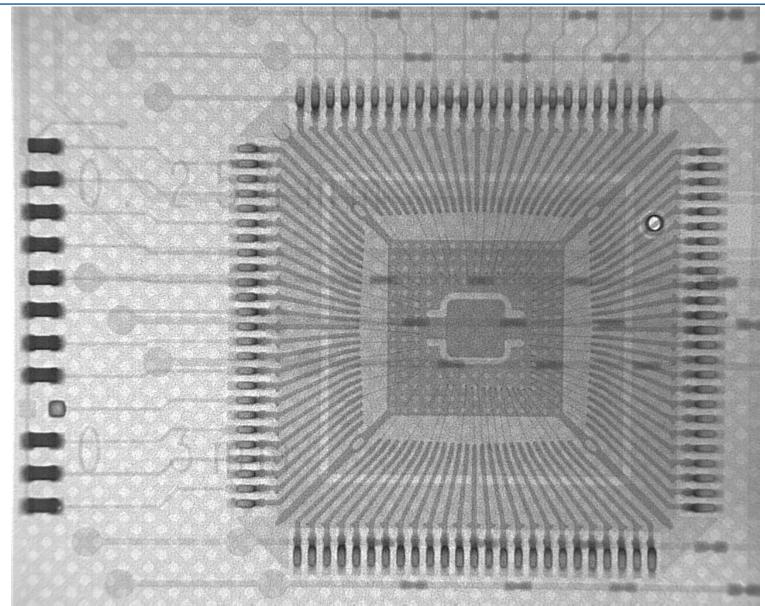
Filter Stärke: 100 Akkumulierung: 64 Frames

2.19 W

Medium-High Mag

R+R 32 / Z – X-Ray nach Rework 1 – PZP-S-PQFP-G100

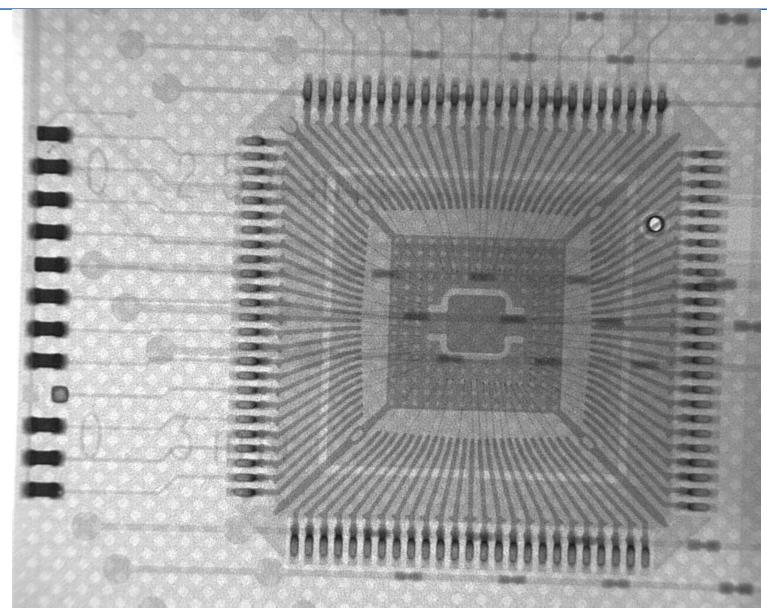






R+R 32 / Z – X-Ray nach Rework 2 – PZP-S-PQFP-G100

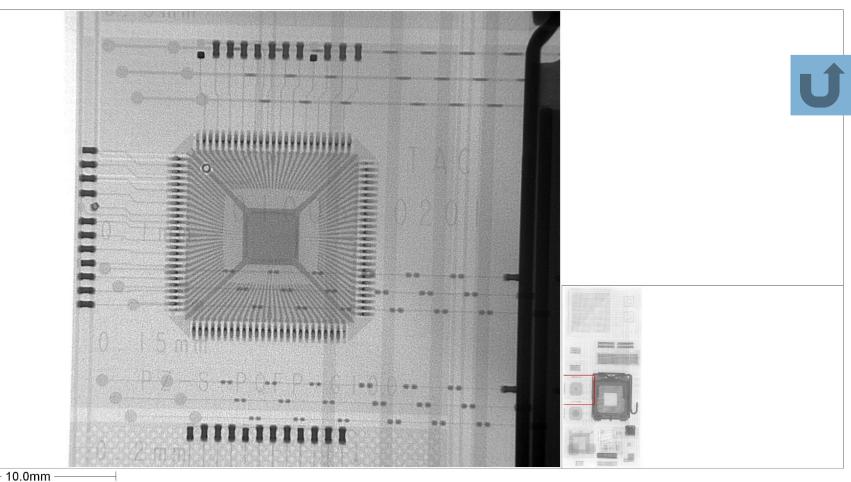






R+R 32 / Z - X-Ray vor Rework - PZ-S-PQFP-G100





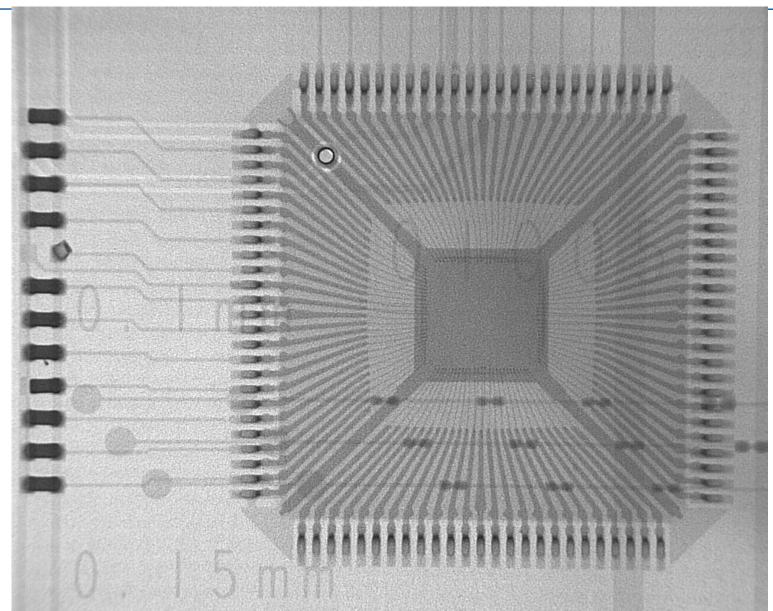
Röhren Spannung: 120 kV Röhren Leistung: 2.19 W

Filter in Verwendung: Medium-High Mag

Filter Stärke: 100 Akkumulierung: 64 Frames

R+R 32 / Z - X-Ray nach Rework 1 - PZ-S-PQFP-G100

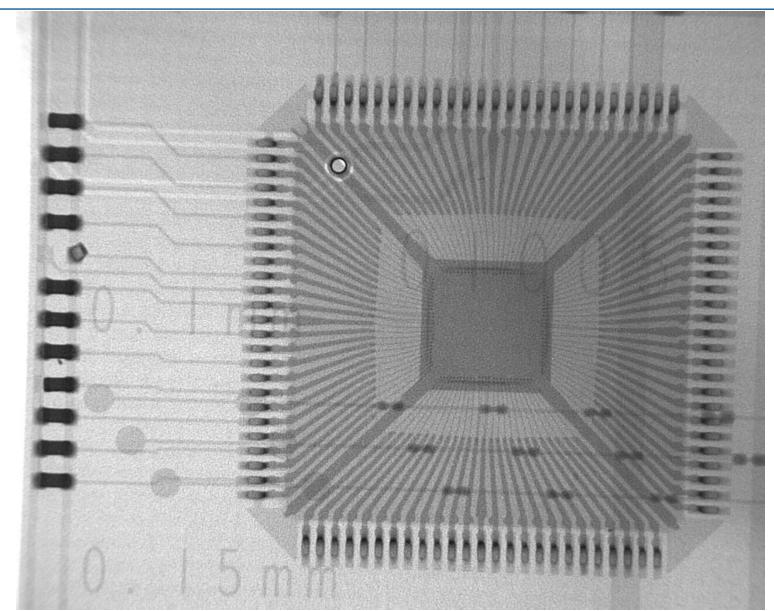






R+R 32 / Z - X-Ray nach Rework 2 - PZ-S-PQFP-G100





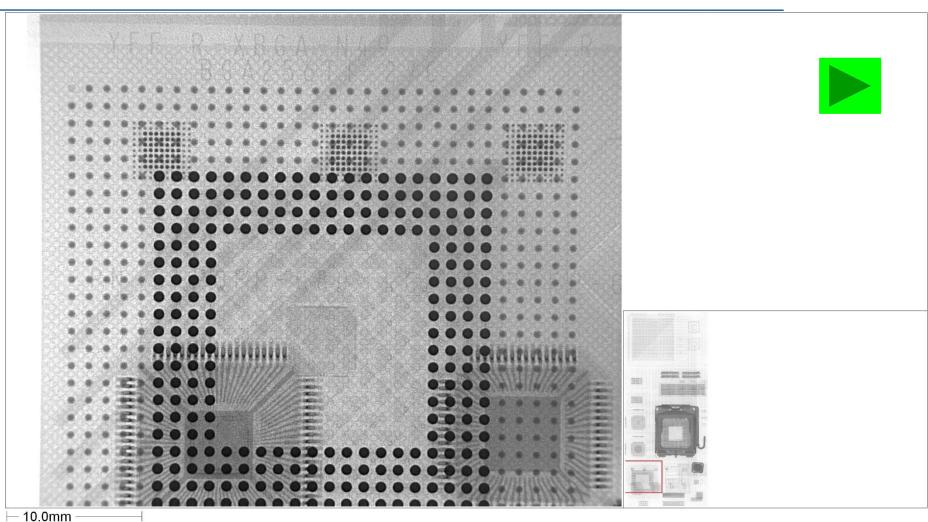




Baugruppe R+R 33 / Z

R+R 33 / Z - X-Ray vor Rework - BGA 256





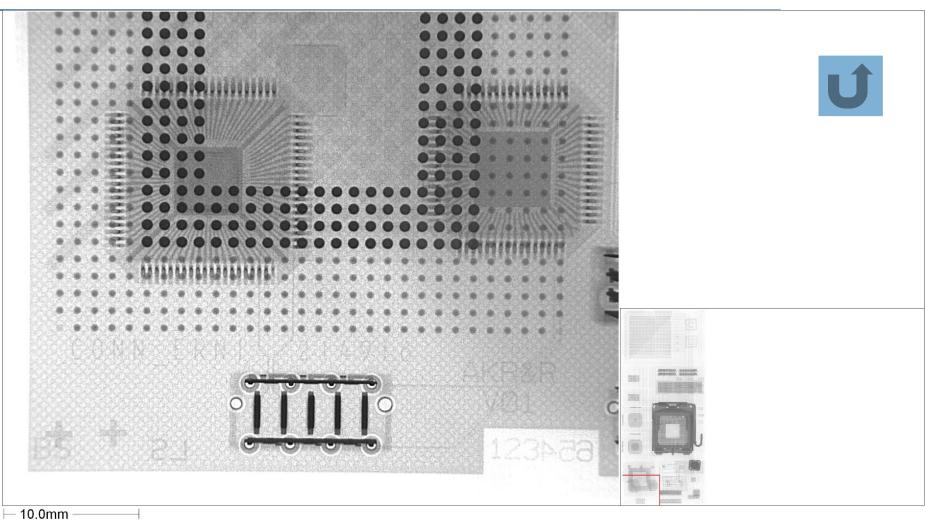
Röhren Spannung: 120 kV Röhren Leistung: 2.20 W

Filter in Verwendung: Medium-High Mag

Filter Stärke: 100 Akkumulierung: 64 Frames

R+R 33 / Z - X-Ray vor Rework - BGA 256





(*)

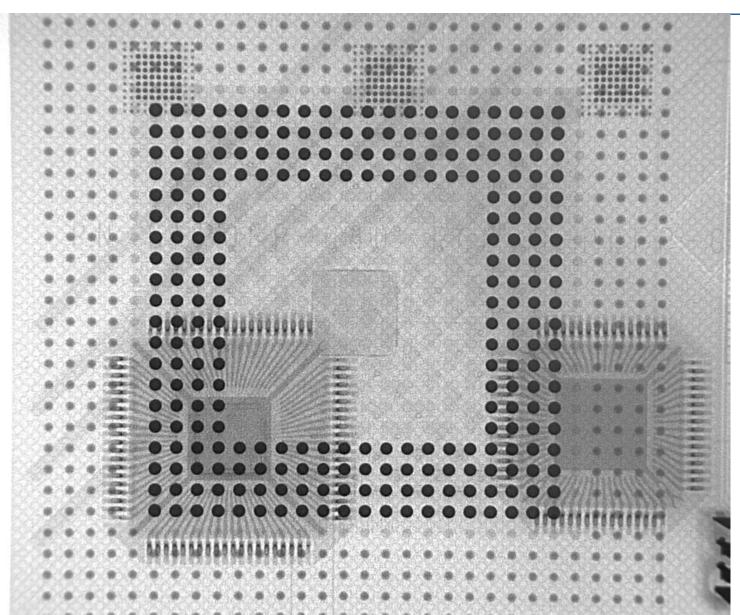
Röhren Spannung: 120 kV Röhren Leistung: 2.19 W

Filter in Verwendung: Medium-High Mag

Filter Stärke: 100
Akkumulierung: 64 Frames

R+R 33 / Z – X-Ray nach Rework 1 – BGA 256

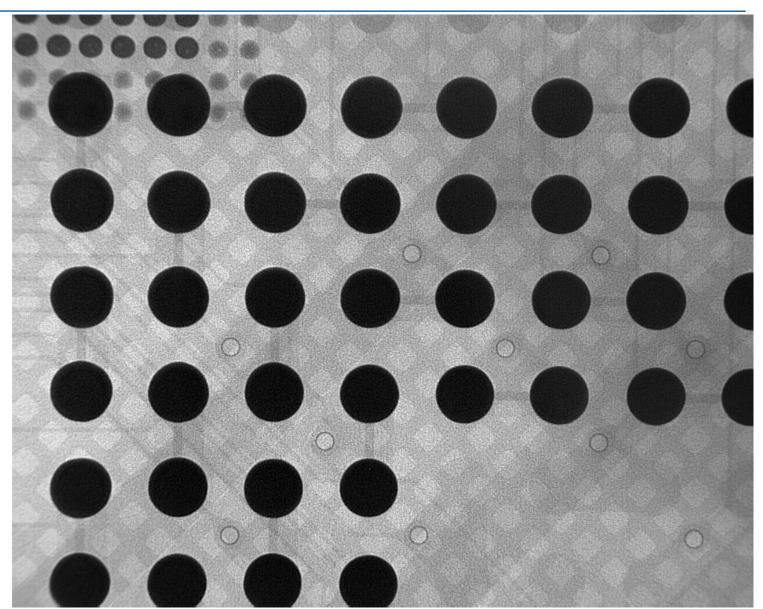






R+R 33 / Z - X-Ray nach Rework 1 / Detail - BGA 256

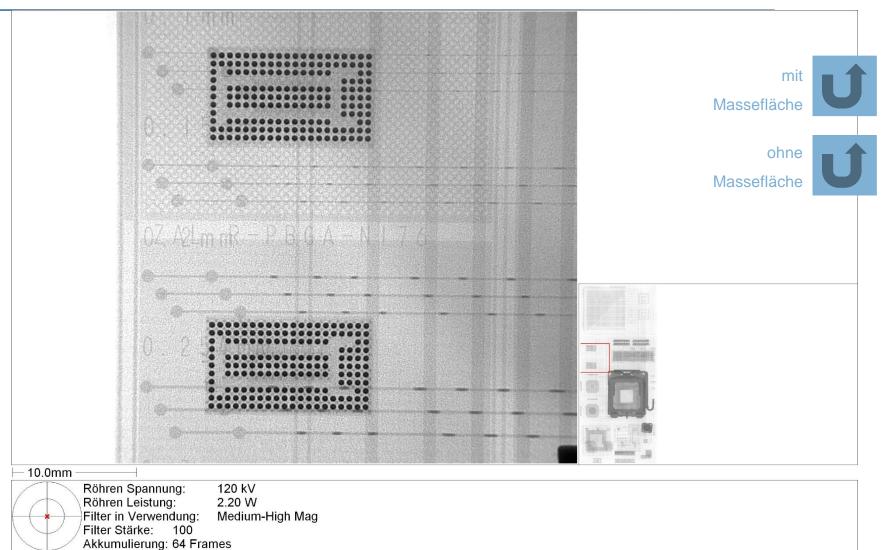






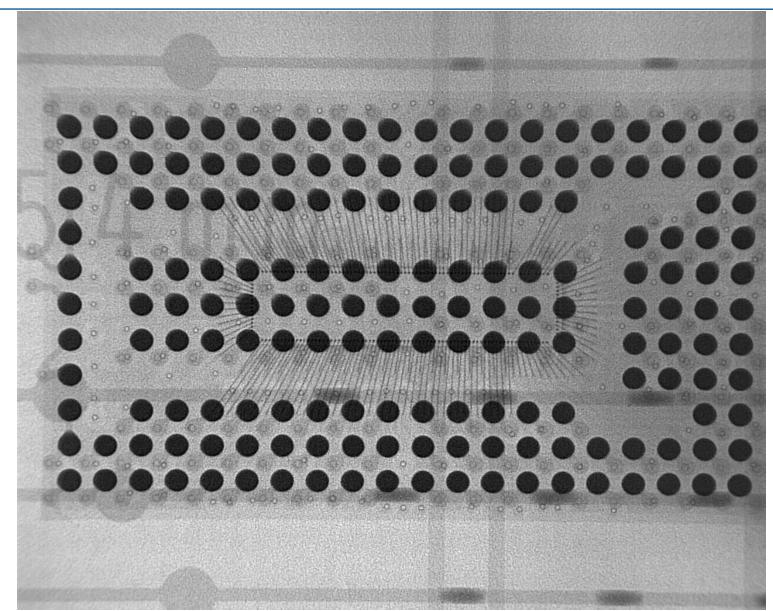
R+R 33 / Z – X-Ray vor Rework – ZAL R-PBGA-N176





R+R 33 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (mit Massefläche)

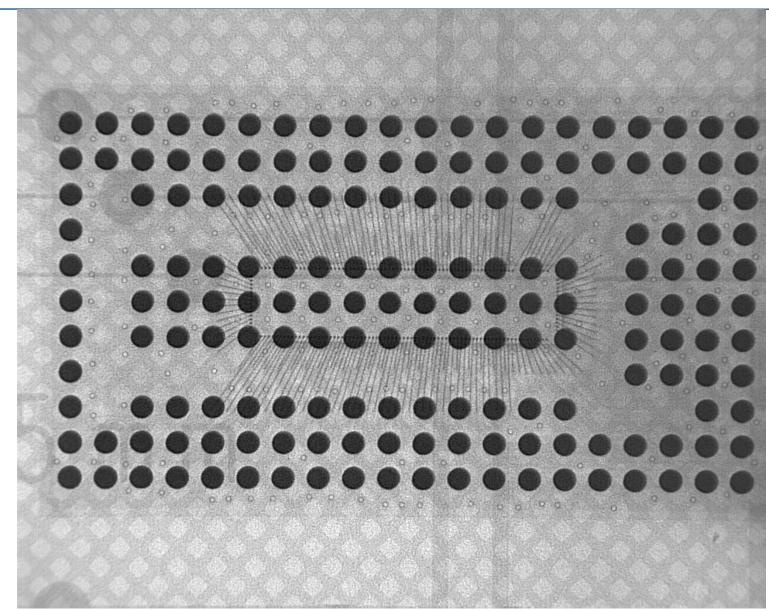






R+R 33 / Z – X-Ray nach Rework 1 – ZAL R-PBGA-N176 (ohne Massefläche)

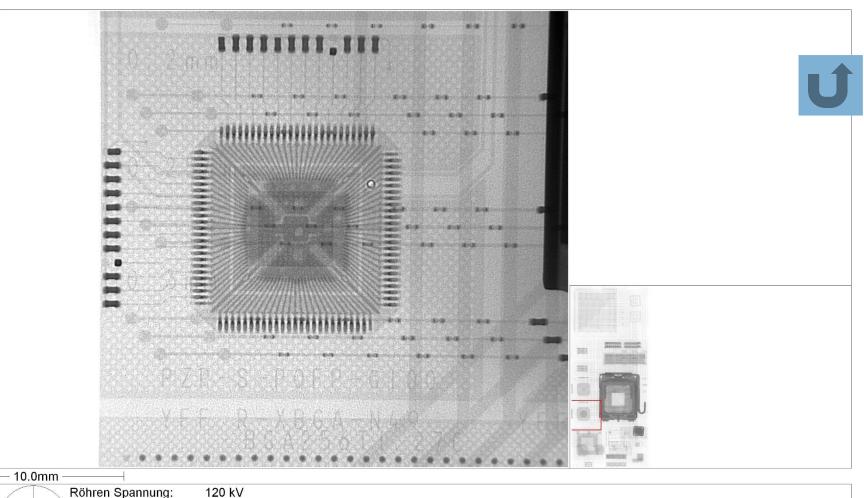






R+R 33 / Z - X-Ray vor Rework - PZP-S-PQFP-G100





Röhren Leistung:

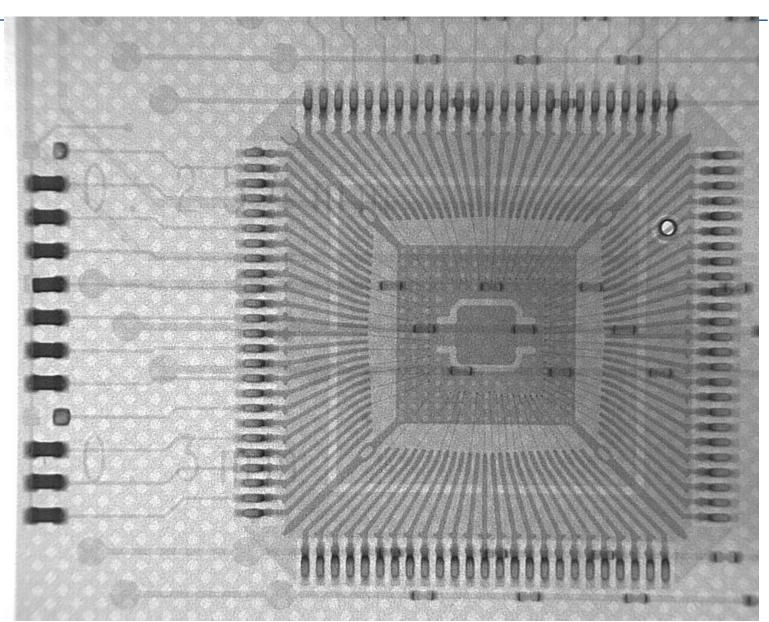
Filter in Verwendung: Me Filter Stärke: 100 Akkumulierung: 64 Frames

2.20 W

Medium-High Mag

R+R 33 / Z – X-Ray nach Rework 1 – PZP-S-PQFP-G100

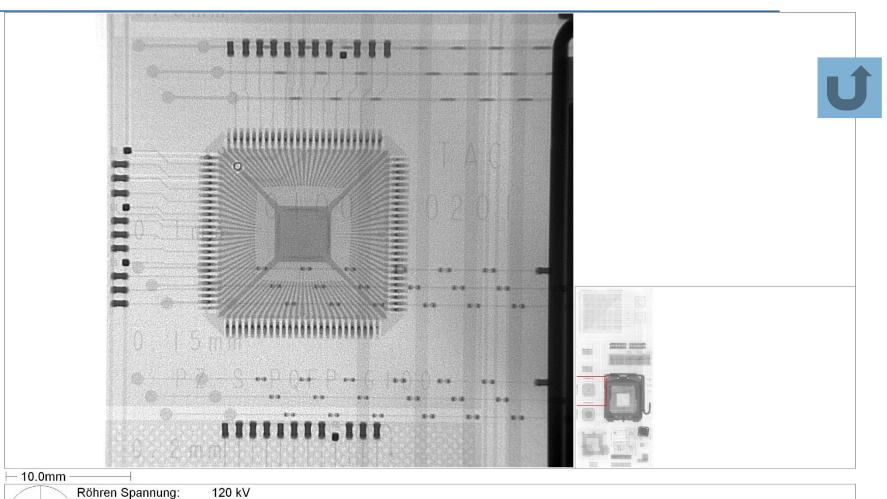






R+R 33 / Z - X-Ray vor Rework - PZ-S-PQFP-G100





PCB and Electronic Systems – Rework elektronischer Baugruppen

Röhren Leistung: Filter in Verwendung:

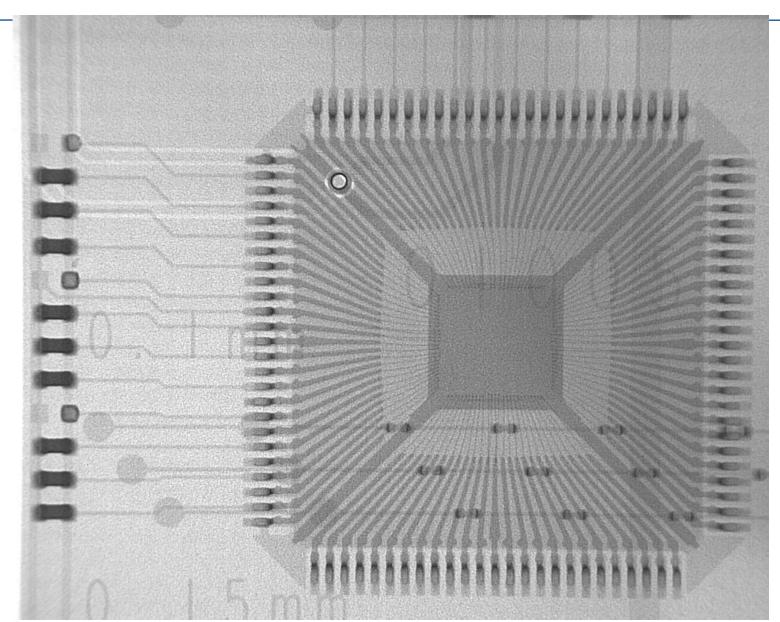
Filter Stärke: 100 Akkumulierung: 64 Frames

2.19 W

Medium-High Mag

R+R 33 / Z - X-Ray nach Rework 1 - PZ-S-PQFP-G100





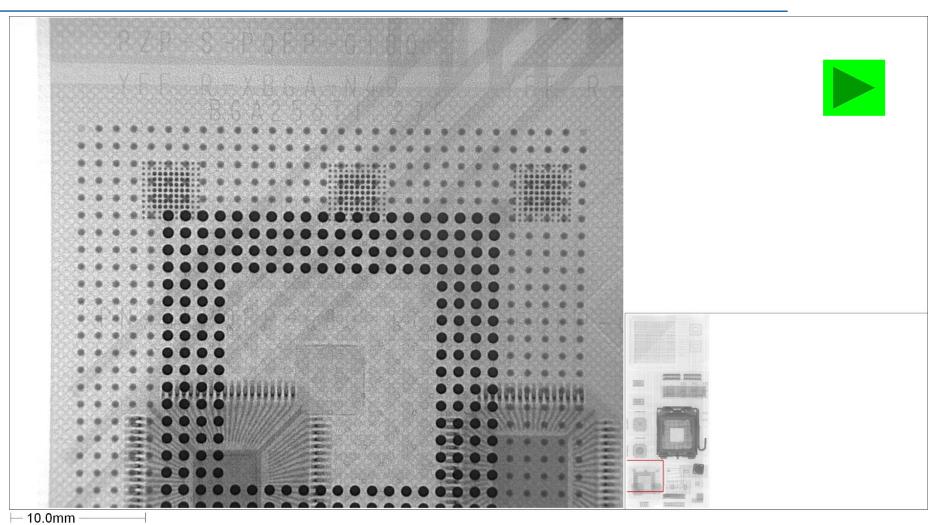




Baugruppe R+R 34 / Z

R+R 34 / Z - X-Ray vor Rework - BGA 256





PCB and Electronic Systems – Rework elektronischer Baugruppen

Filter Stärke:

Röhren Spannung:

Filter in Verwendung:

Akkumulierung: 64 Frames

Röhren Leistung:

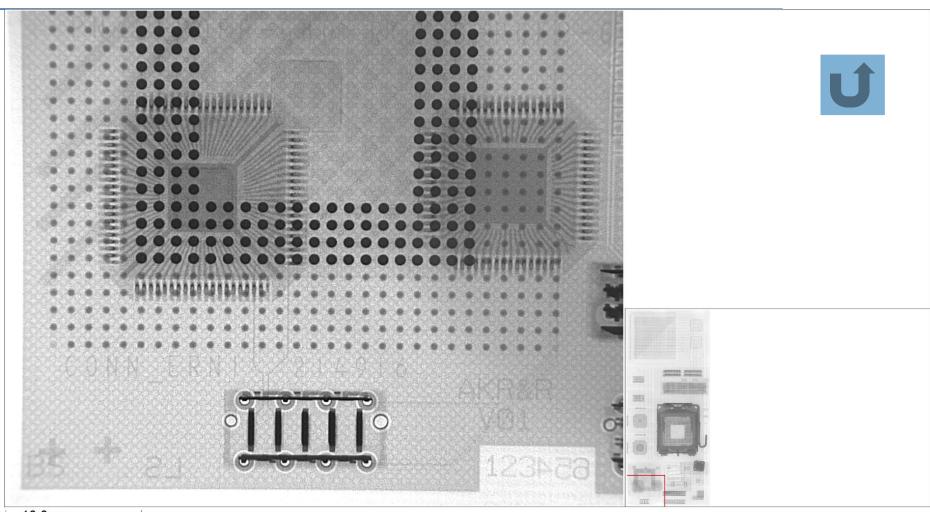
120 kV

2.20 W

Medium-High Mag

R+R 34 / Z - X-Ray vor Rework - BGA 256





- 10.0mm

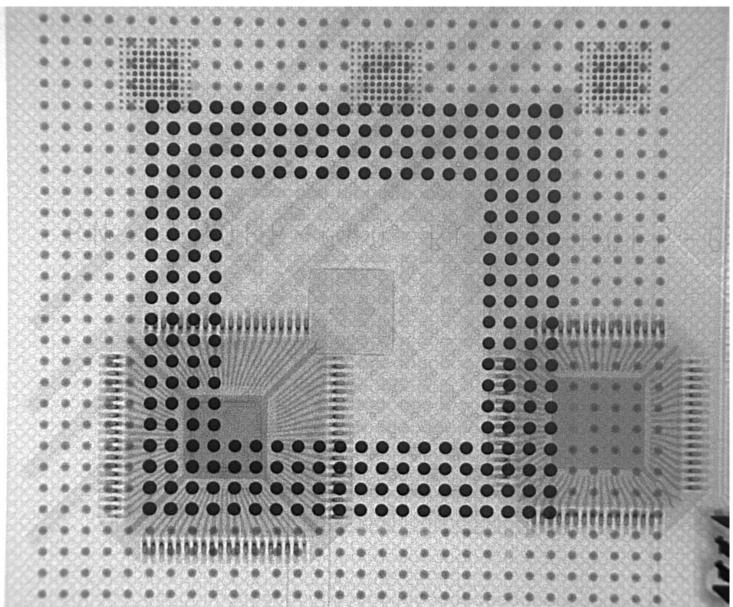
Röhren Spannung: 120 kV Röhren Leistung: 2.19 W

Filter in Verwendung: Medium-High Mag

Filter Stärke: 100 Akkumulierung: 64 Frames

R+R 34 / Z - X-Ray nach Rework 1 - BGA 256

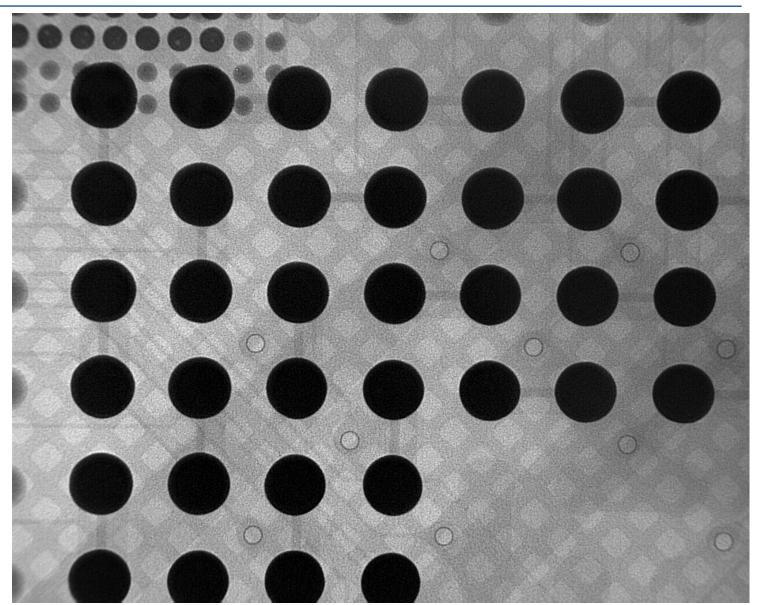






R+R 34 / Z - X-Ray nach Rework 1 / Detail - BGA 256

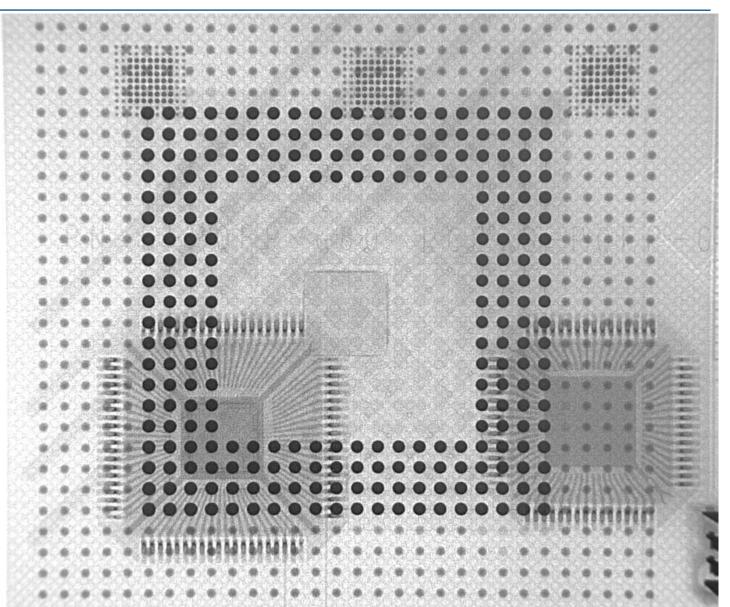






R+R 34 / Z - X-Ray nach Rework 2 - BGA 256

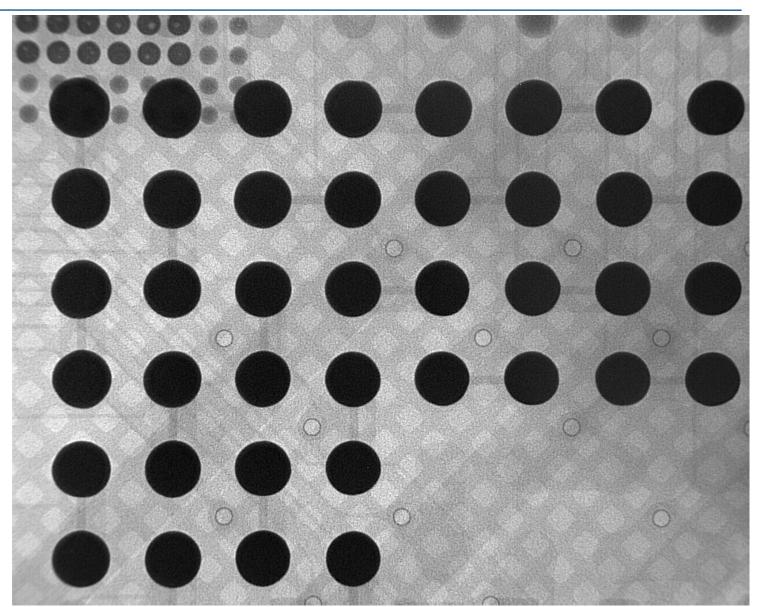






R+R 34 / Z - X-Ray nach Rework 2 / Detail - BGA 256

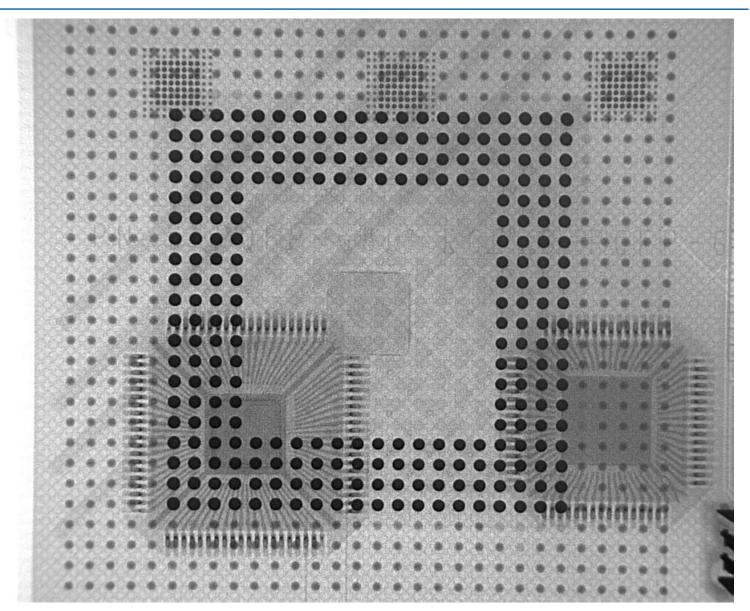






R+R 34 / Z - X-Ray nach Rework 3 - BGA 256

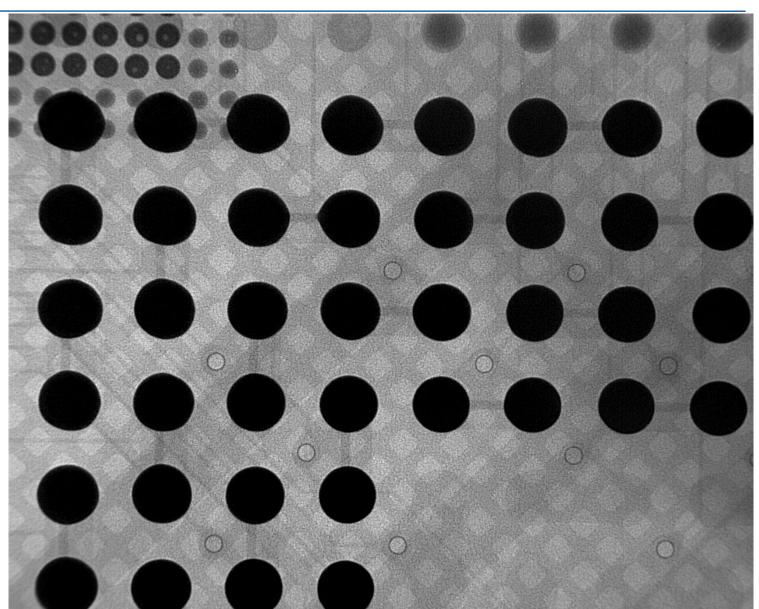






R+R 34 / Z - X-Ray nach Rework 3 / Detail - BGA 256

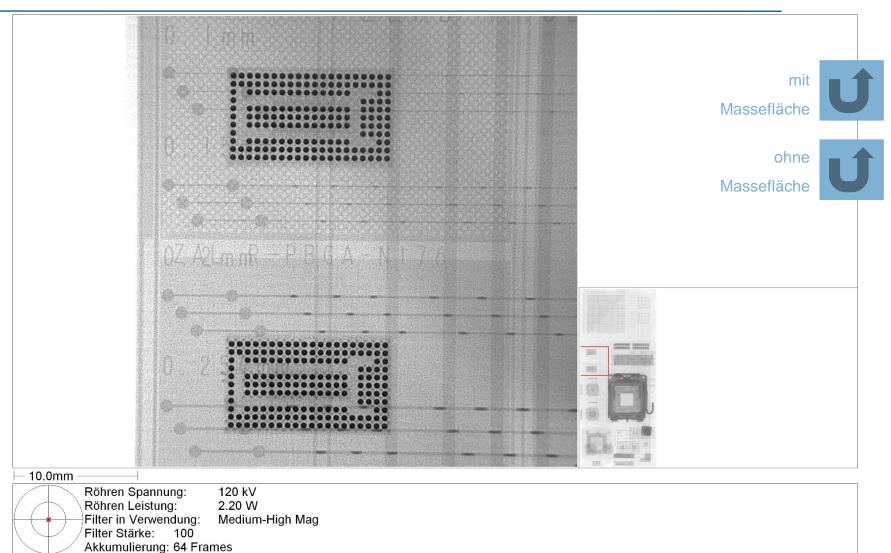






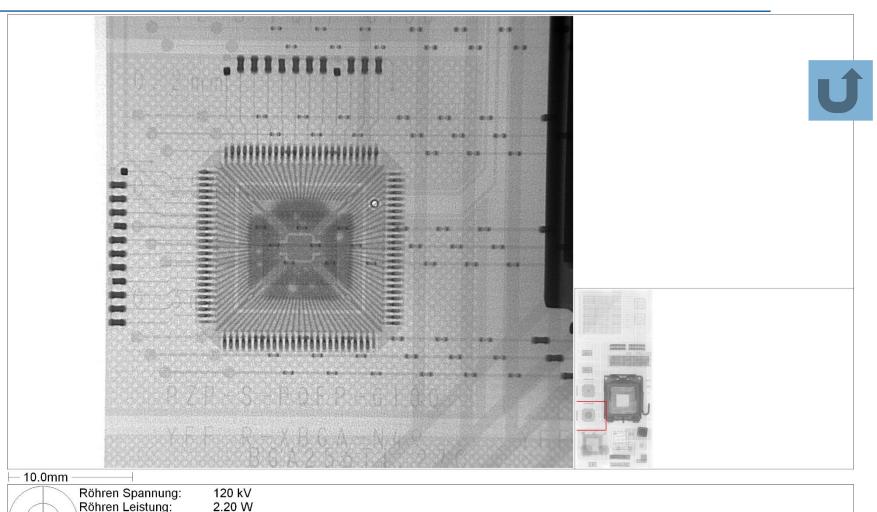
R+R 34 / Z – X-Ray vor Rework – ZAL R-PBGA-N176





R+R 34 / Z - X-Ray vor Rework - PZP-S-PQFP-G100





PCB and Electronic Systems – Rework elektronischer Baugruppen

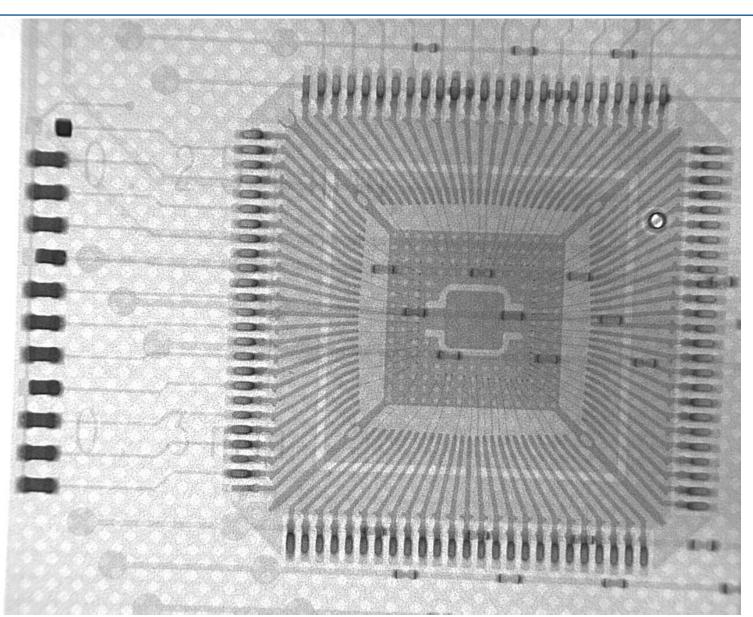
Filter in Verwendung:

Filter Stärke: 100 Akkumulierung: 64 Frames

Medium-High Mag

R+R 34 / Z – X-Ray nach Rework 1 – PZP-S-PQFP-G100

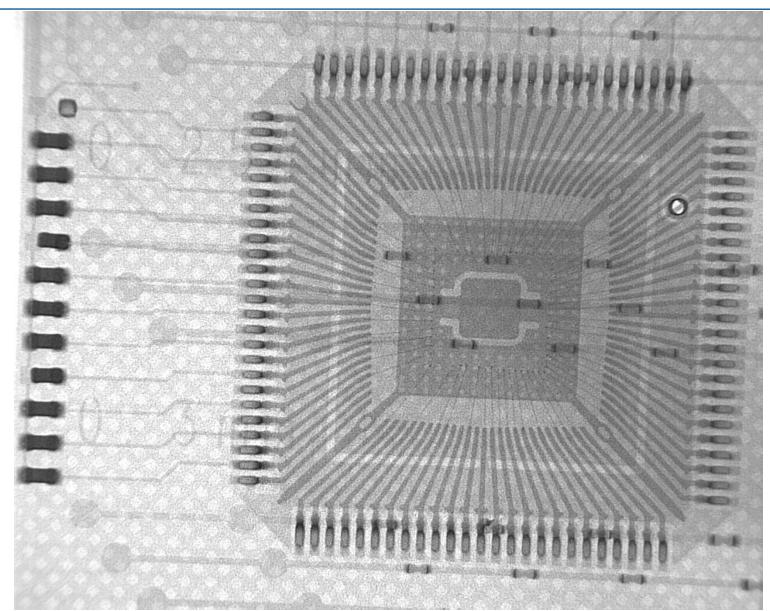






R+R 34 / Z – X-Ray nach Rework 2 – PZP-S-PQFP-G100

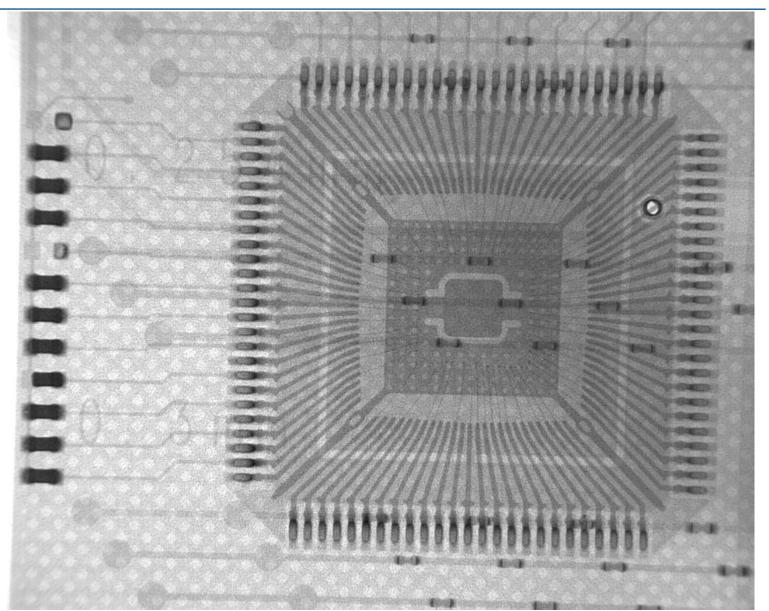






R+R 34 / Z - X-Ray nach Rework 3 - PZP-S-PQFP-G100

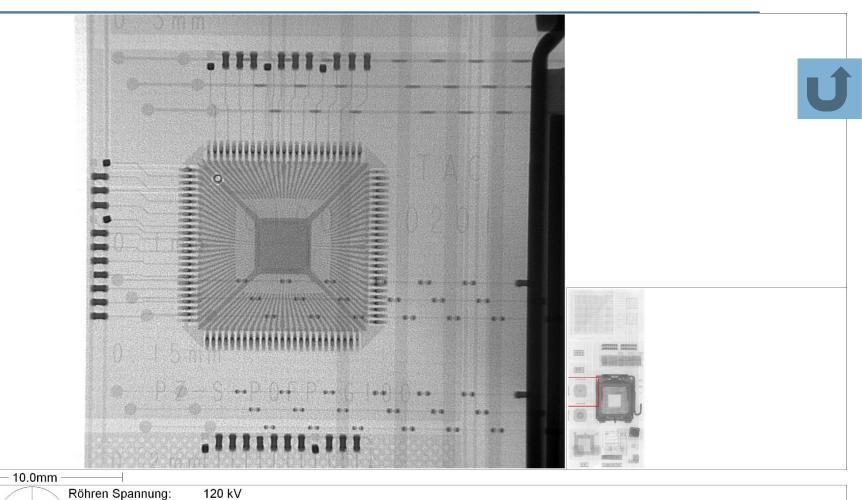






R+R 34 / Z - X-Ray vor Rework - PZ-S-PQFP-G100





PCB and Electronic Systems - Rework elektronischer Baugruppen

Röhren Leistung: Filter in Verwendung:

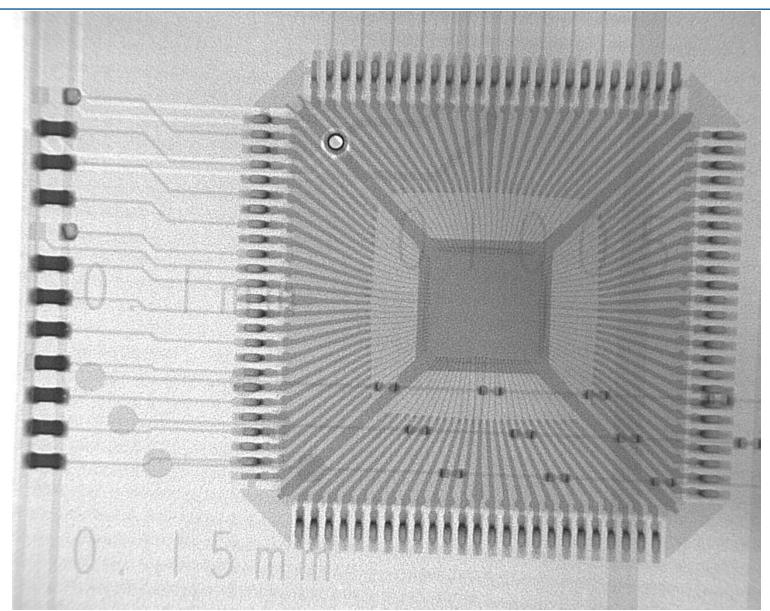
Filter Stärke: 100 Akkumulierung: 64 Frames

2.19 W

Medium-High Mag

R+R 34 / Z - X-Ray nach Rework 1 - PZ-S-PQFP-G100

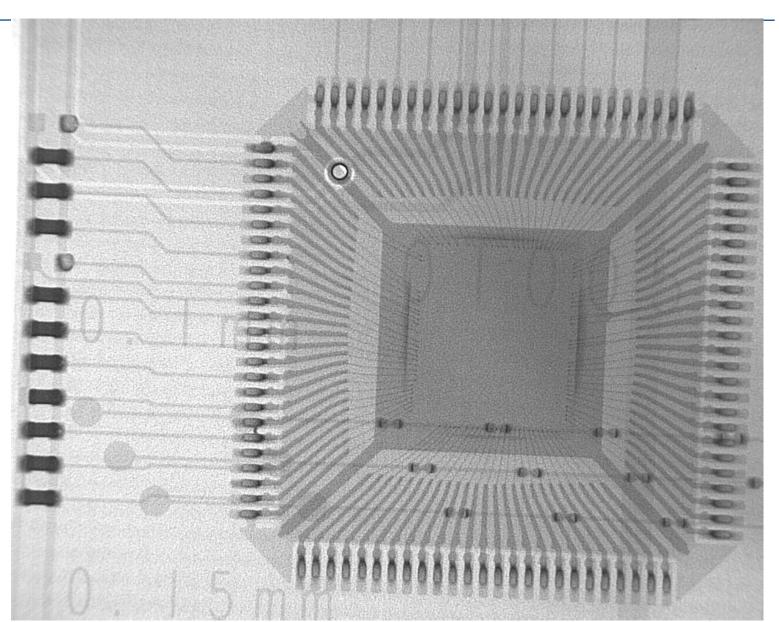






R+R 34 / Z - X-Ray nach Rework 2 - PZ-S-PQFP-G100

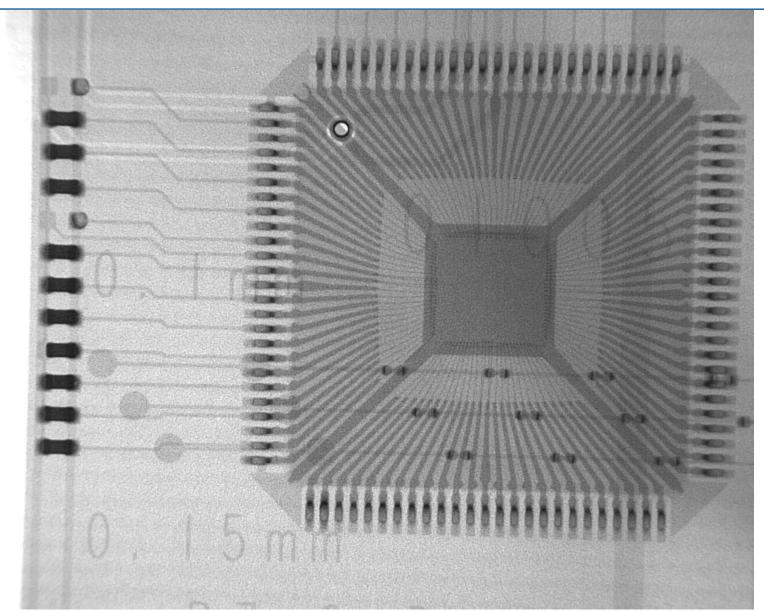






R+R 34 / Z - X-Ray nach Rework 3 - PZ-S-PQFP-G100





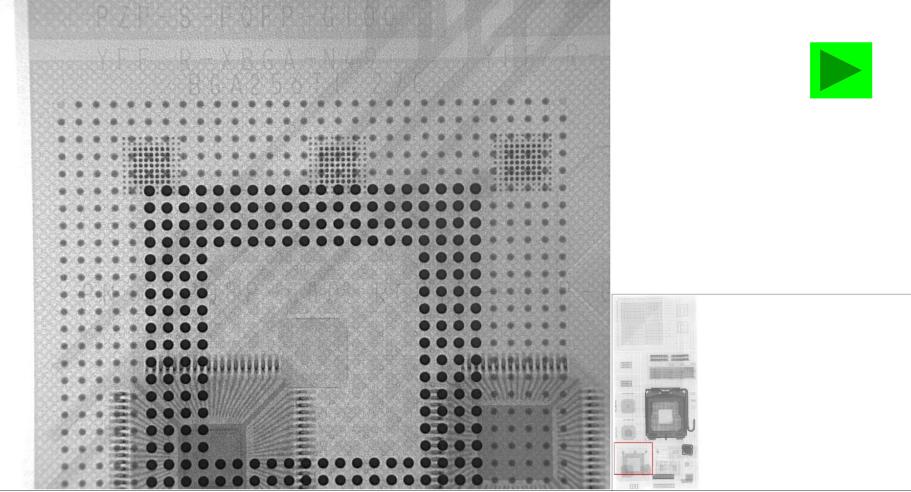




Baugruppe R+R 35 / Z

R+R 35 / Z – X-Ray vor Rework – BGA 256





- 10.0mm

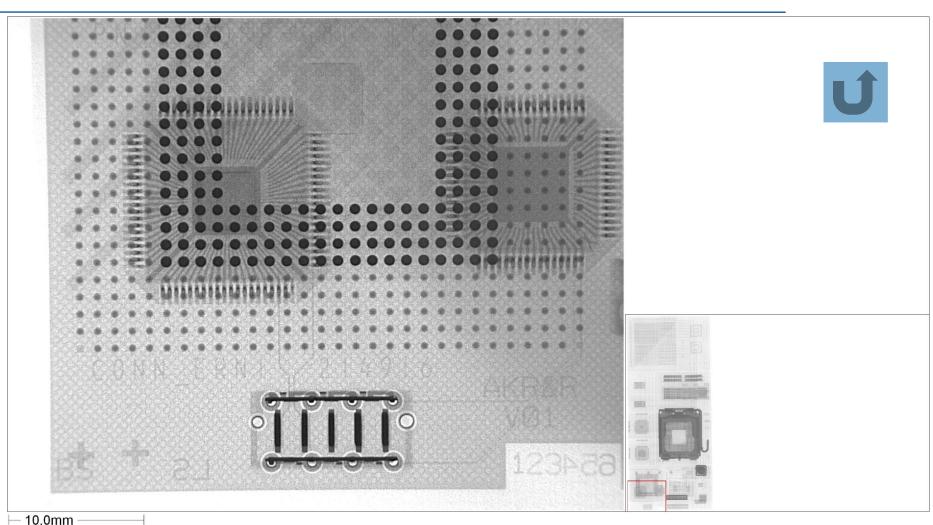
Röhren Spannung: 120 kV Röhren Leistung: 2.19 W

Filter in Verwendung: Medium-High Mag

Filter Stärke: 100 Akkumulierung: 64 Frames

R+R 35 / Z - X-Ray vor Rework - BGA 256





PCB and Electronic Systems – Rework elektronischer Baugruppen

Filter Stärke:

Röhren Spannung:

Filter in Verwendung:

Akkumulierung: 64 Frames

100

Röhren Leistung:

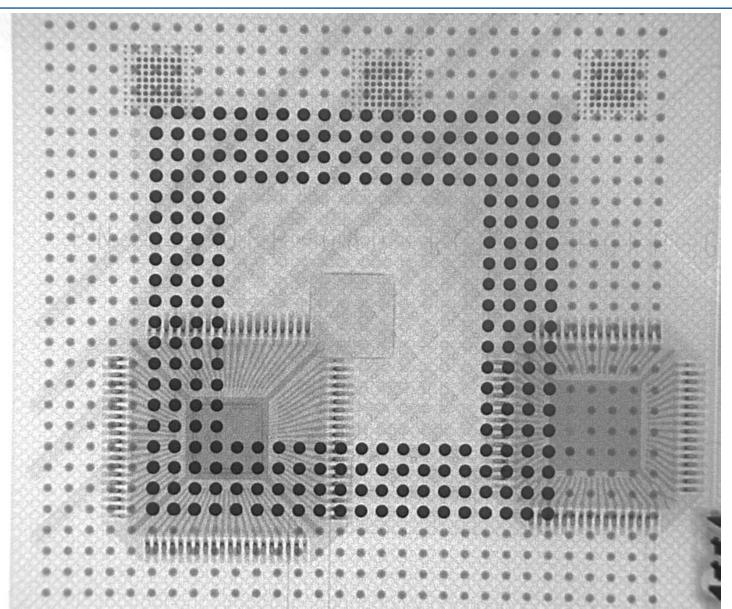
120 kV

2.19 W

Medium-High Mag

R+R 35 / Z - X-Ray nach Rework 1 - BGA 256

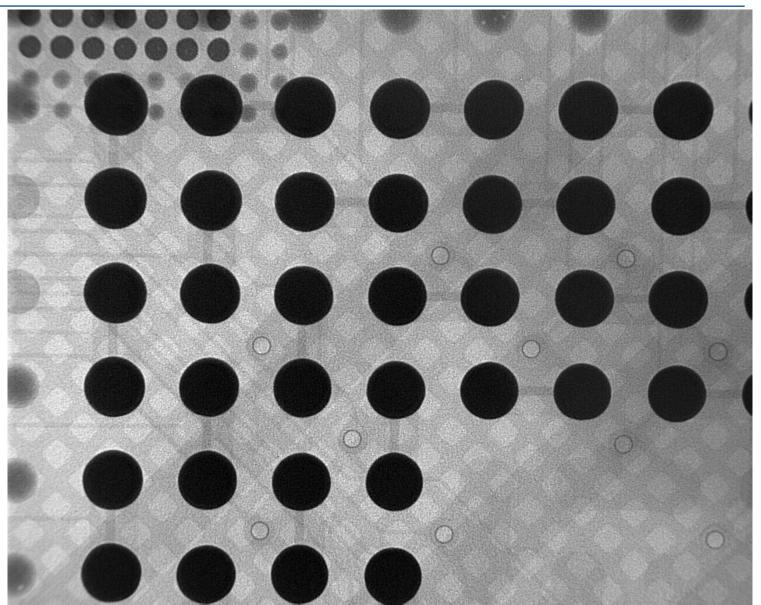






R+R 35 / Z - X-Ray nach Rework 1 / Detail - BGA 256

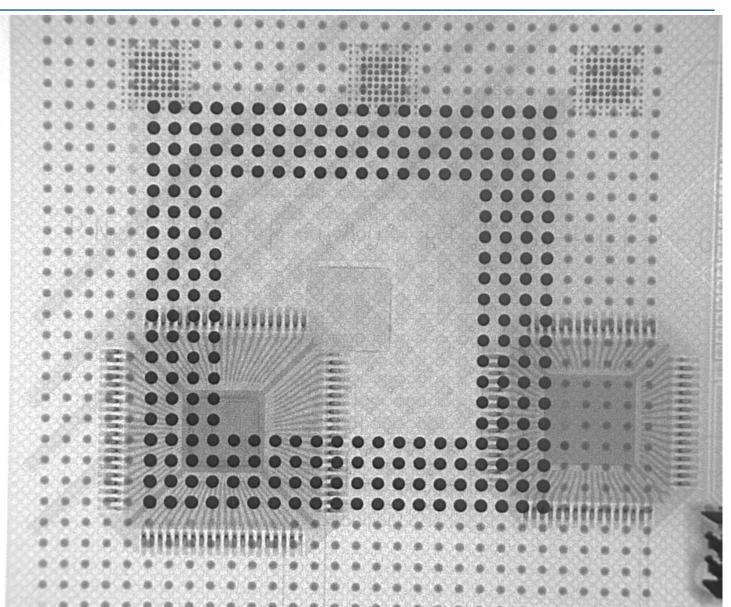






R+R 35 / Z - X-Ray nach Rework 2 - BGA 256

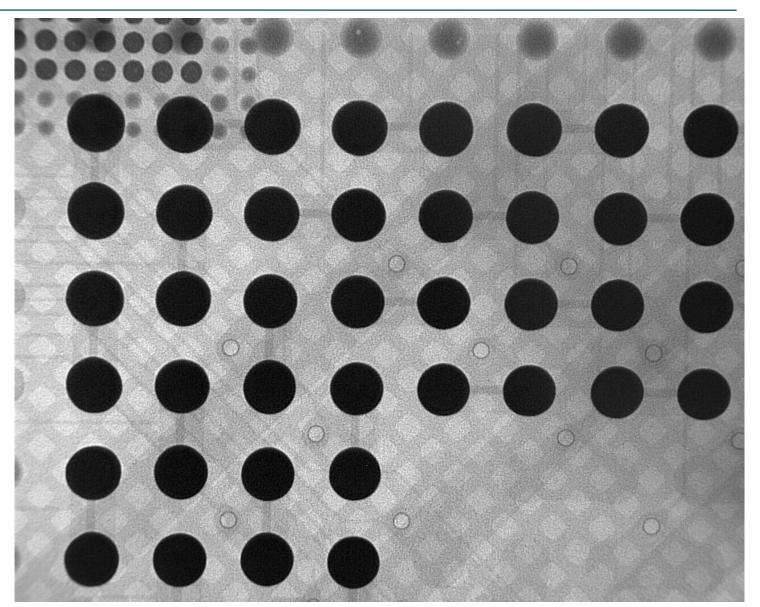






R+R 35 / Z - X-Ray nach Rework 2 / Detail - BGA 256

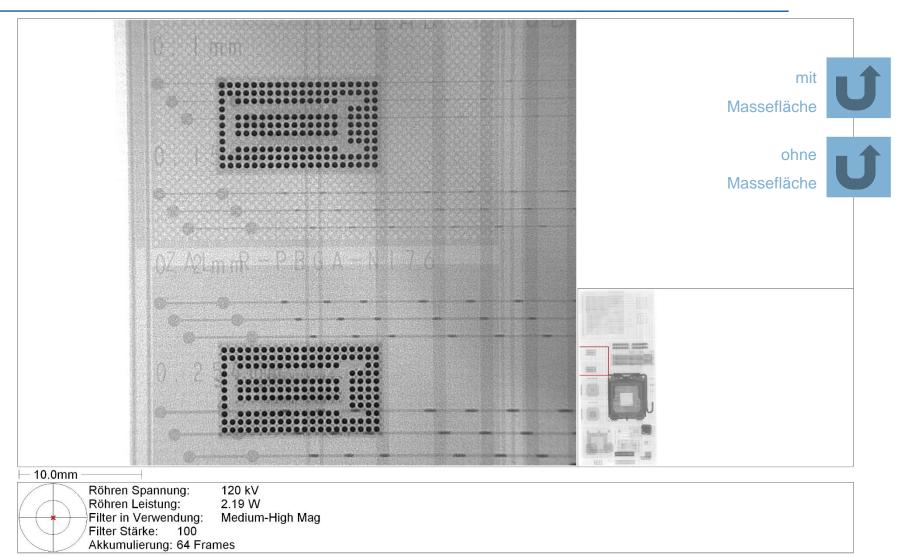






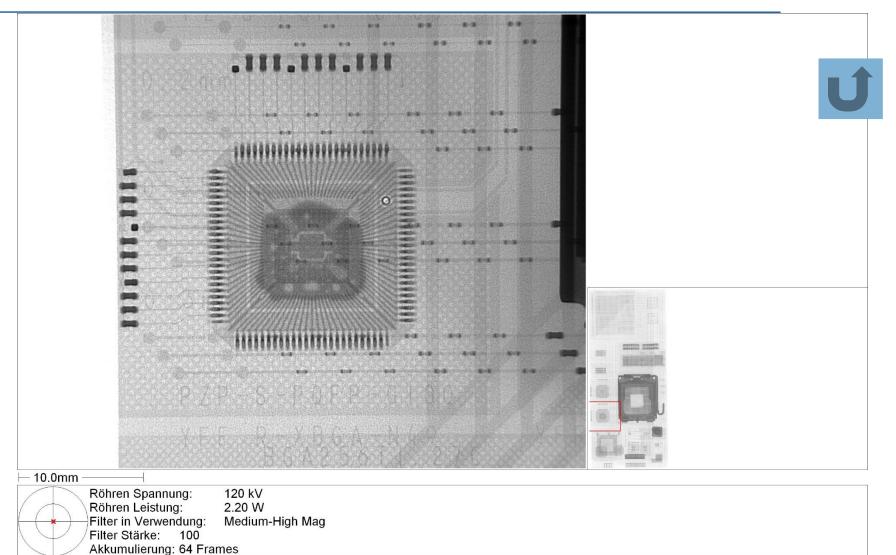
R+R 35 / Z - X-Ray vor Rework - ZAL R-PBGA-N176





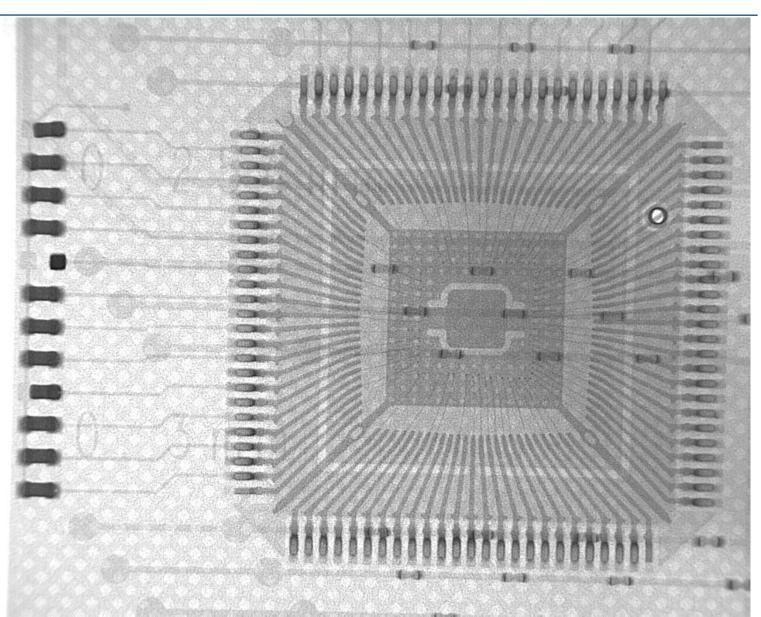
R+R 35 / Z – X-Ray vor Rework – PZP-S-PQFP-G100





R+R 35 / Z – X-Ray nach Rework 1 – PZP-S-PQFP-G100

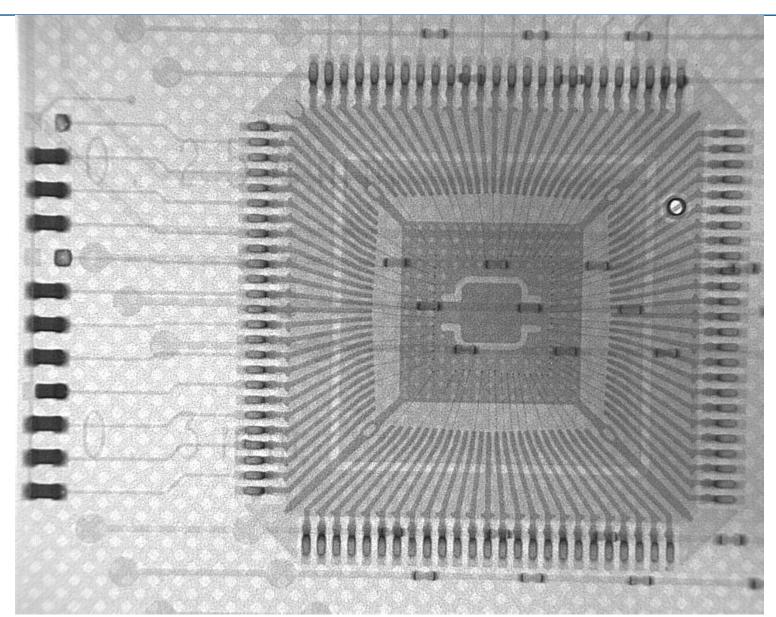






R+R 35 / Z – X-Ray nach Rework 2 – PZP-S-PQFP-G100

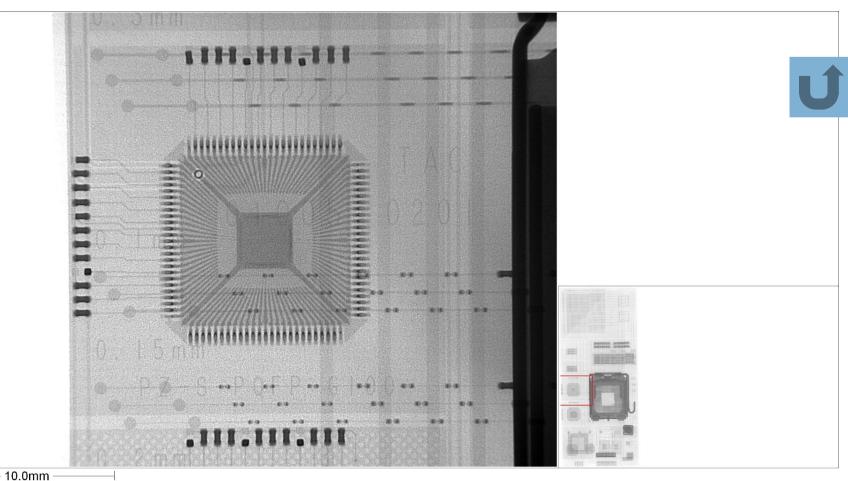






R+R 35 / Z - X-Ray vor Rework - PZ-S-PQFP-G100





PCB and Electronic Systems - Rework elektronischer Baugruppen

Röhren Spannung:

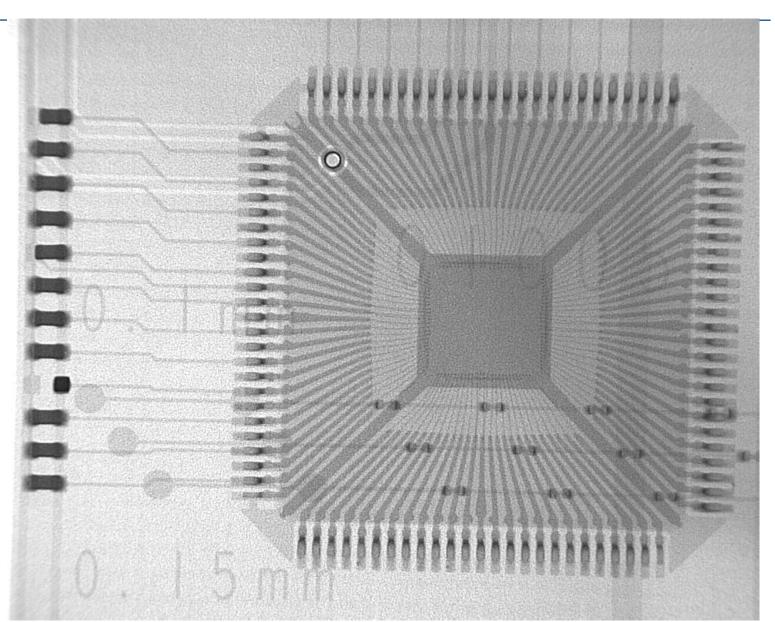
Filter Stärke: 100 Akkumulierung: 64 Frames

Röhren Leistung: Filter in Verwendung: 120 kV 2.20 W

Medium-High Mag

R+R 35 / Z – X-Ray nach Rework 1 – PZ-S-PQFP-G100

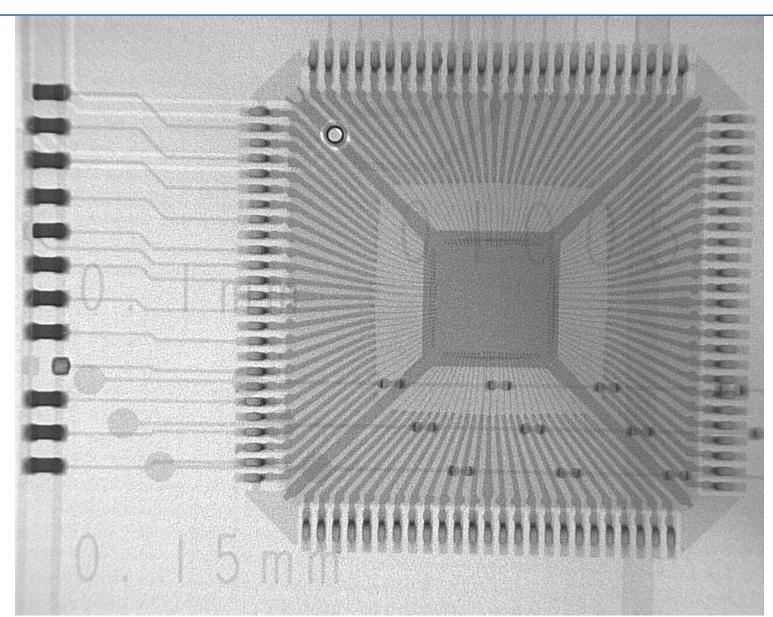






R+R 35 / Z - X-Ray nach Rework 2 - PZ-S-PQFP-G100





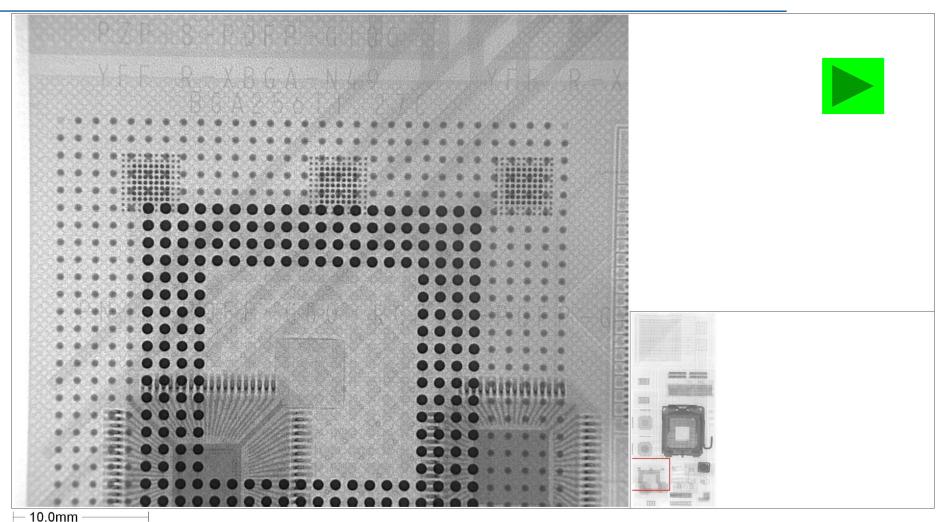




Baugruppe R+R 36 / Z

R+R 36 / Z - X-Ray vor Rework - BGA 256





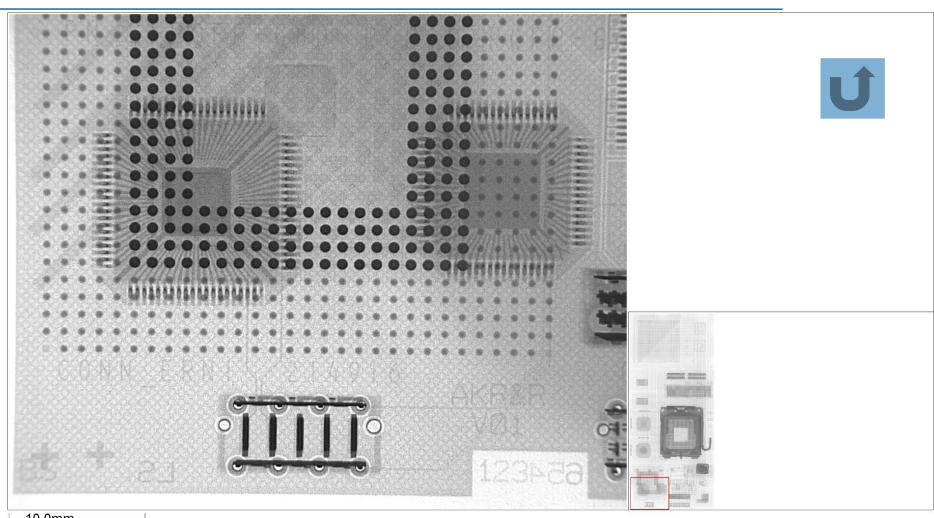
Röhren Spannung: 120 kV
Röhren Leistung: 2.20 W
Filter in Verwendung: Medium

Filter in Verwendung: Medium-High Mag

Filter Stärke: 100
Akkumulierung: 64 Frames

R+R 36 / Z – X-Ray vor Rework – BGA 256





10.0mm

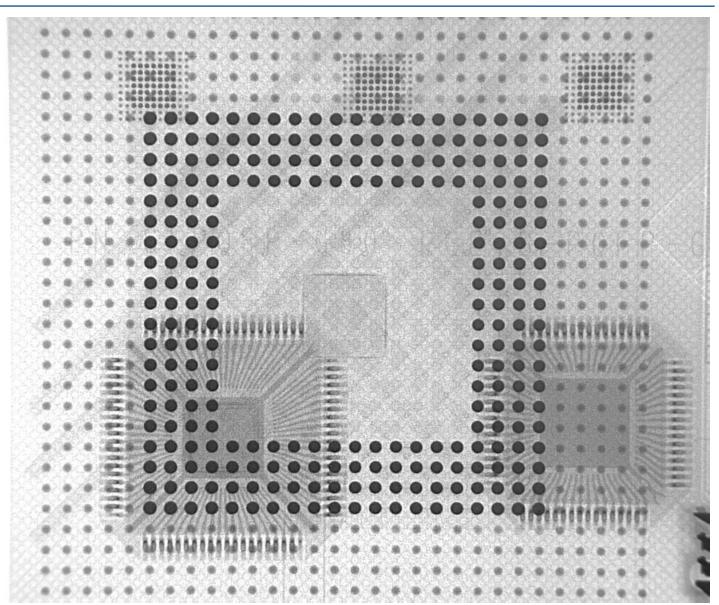
Röhren Spannung: 120 kV 2.20 W Röhren Leistung: Filter in Verwendung: Medium-High Mag

Filter Stärke:

Akkumulierung: 64 Frames

R+R 36 / Z – X-Ray nach Rework 1 – BGA 256

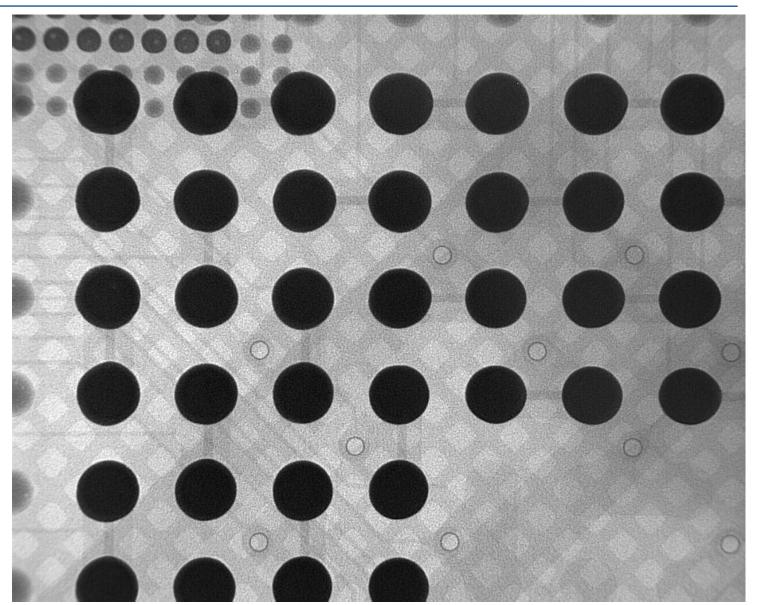






R+R 36 / Z - X-Ray nach Rework 1 / Detail - BGA 256







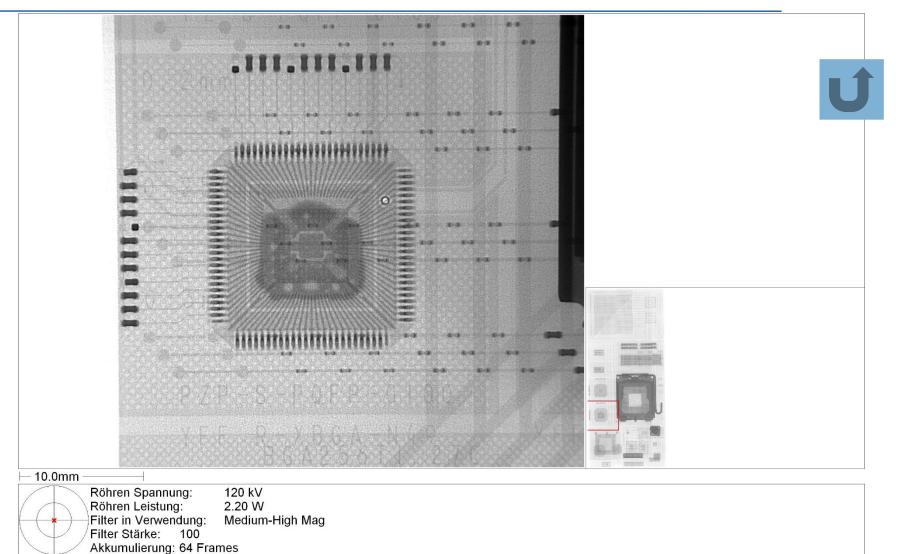
R+R 36 / Z - X-Ray vor Rework - ZAL R-PBGA-N176





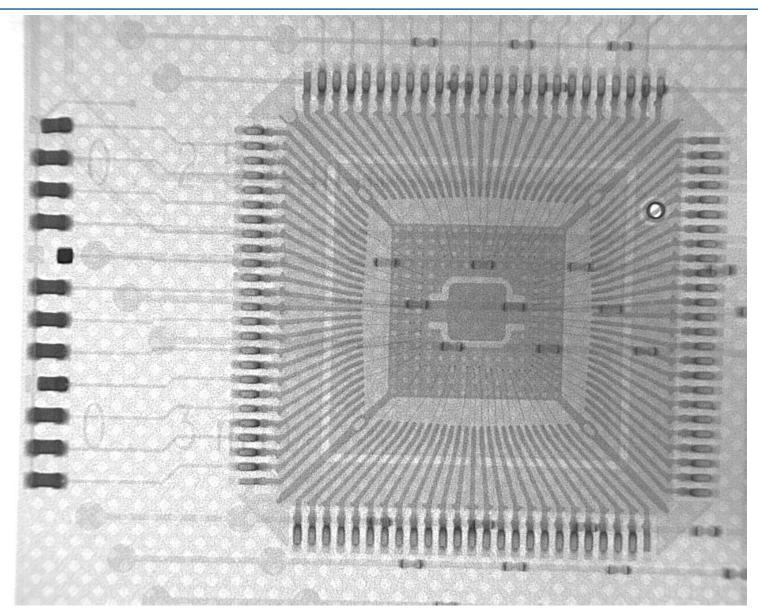
R+R 36 / Z - X-Ray vor Rework - PZP-S-PQFP-G100





R+R 36 / Z – X-Ray nach Rework 1 – PZP-S-PQFP-G100

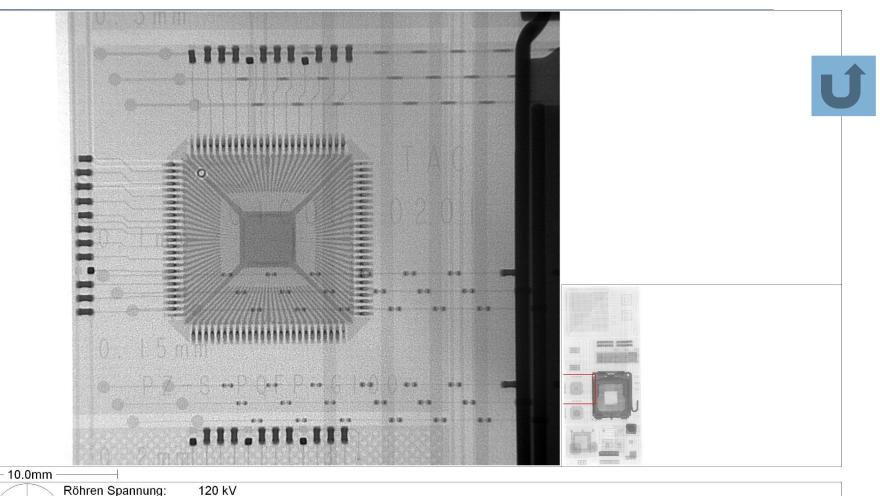






R+R 36 / Z - X-Ray vor Rework - PZ-S-PQFP-G100





PCB and Electronic Systems - Rework elektronischer Baugruppen

Röhren Leistung:

Filter in Verwendung:

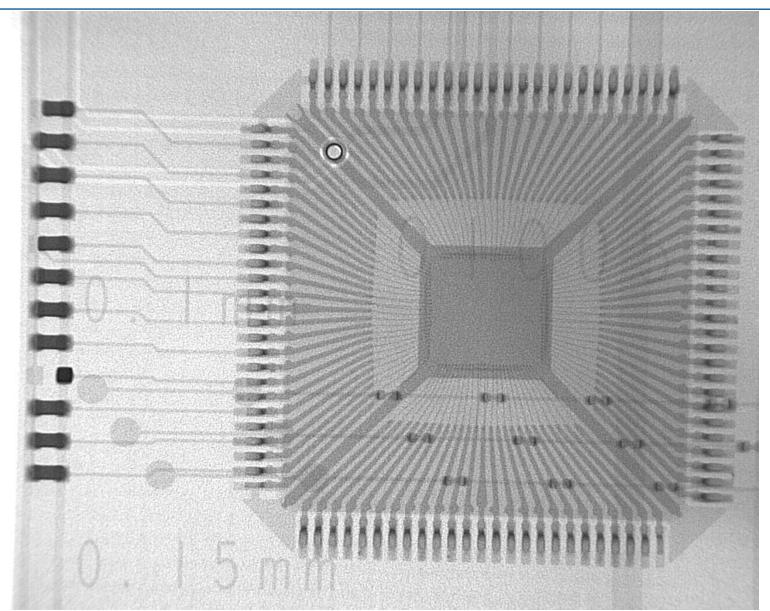
Filter Stärke: 100 Akkumulierung: 64 Frames

2.20 W

Medium-High Mag

R+R 36 / Z – X-Ray nach Rework 1 – PZ-S-PQFP-G100





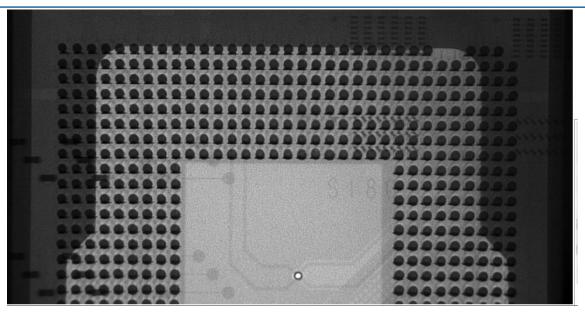




BGA Sockel

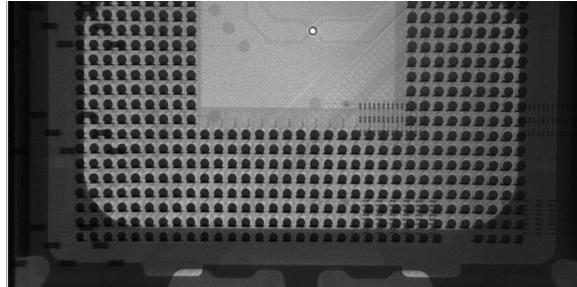
R+R 25 / Z - X-Ray vor Rework - Sockel





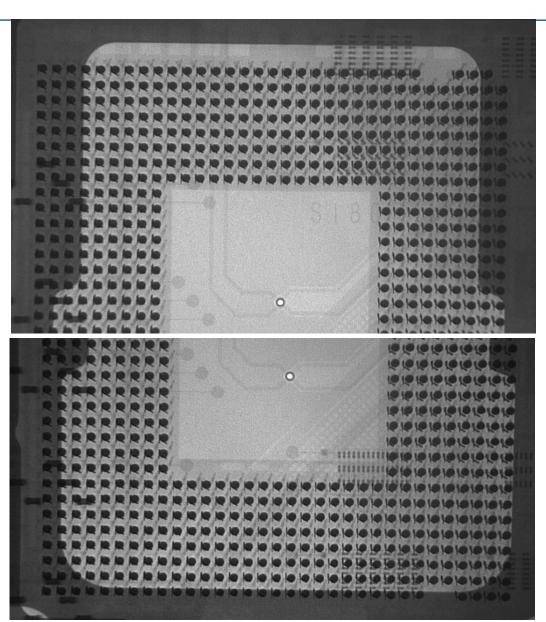






R+R 25 / Z – X-Ray nach Rework 1 mit Flussmittel – Sockel **ZVE**:

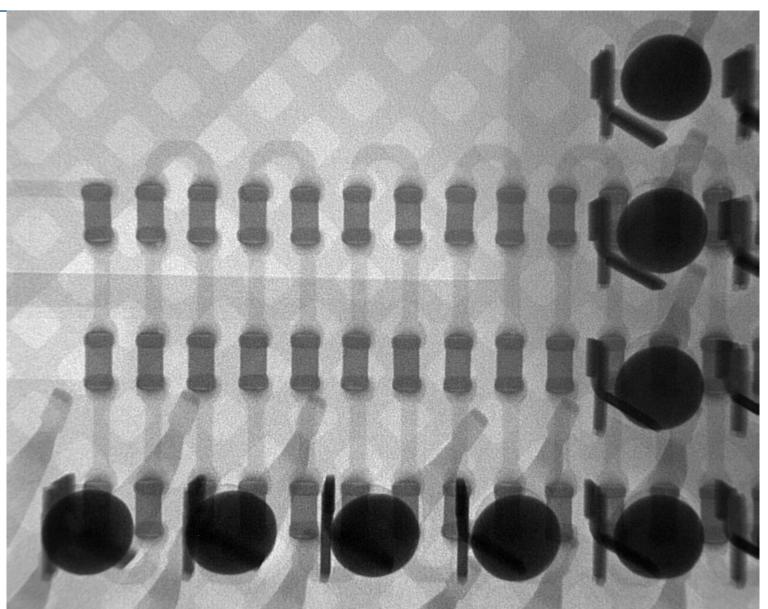






R+R 25 / Z – X-Ray nach Rework 1 mit Flussmittel – Sockel Detail

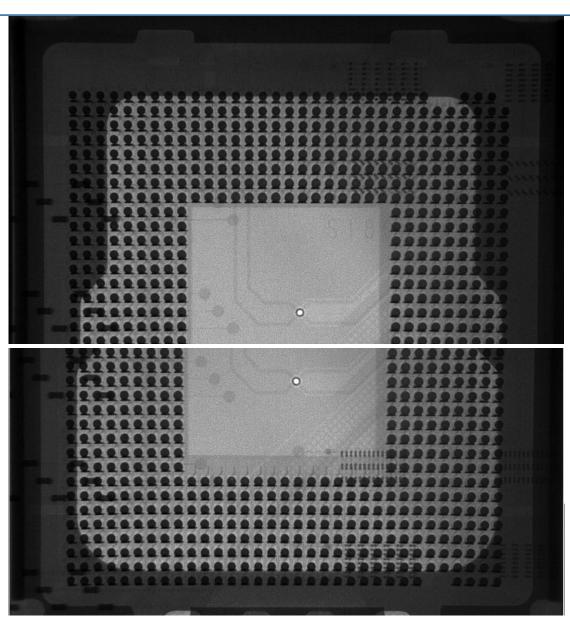






R+R 26 / Z - X-Ray vor Rework - Sockel



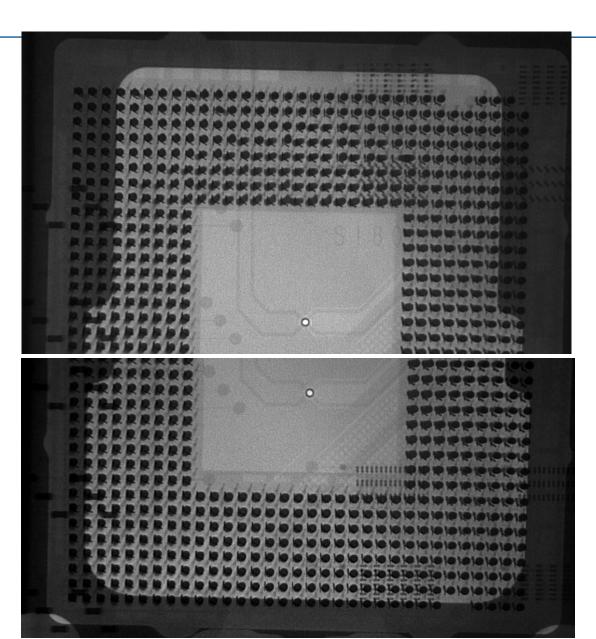






R+R 26 / Z – X-Ray nach Rework 1 mit Flussmittel – Sockel **ZVE**:

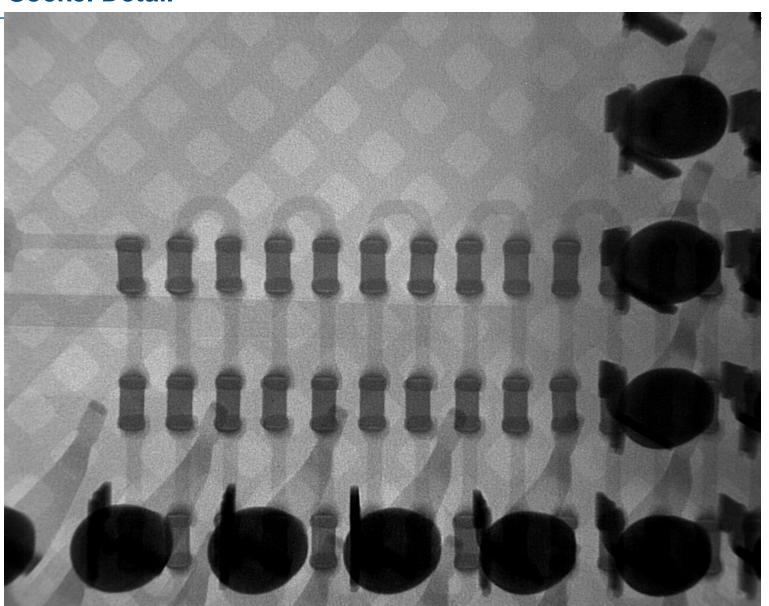






R+R 26 / Z – X-Ray nach Rework 1 mit Flussmittel – Sockel Detail

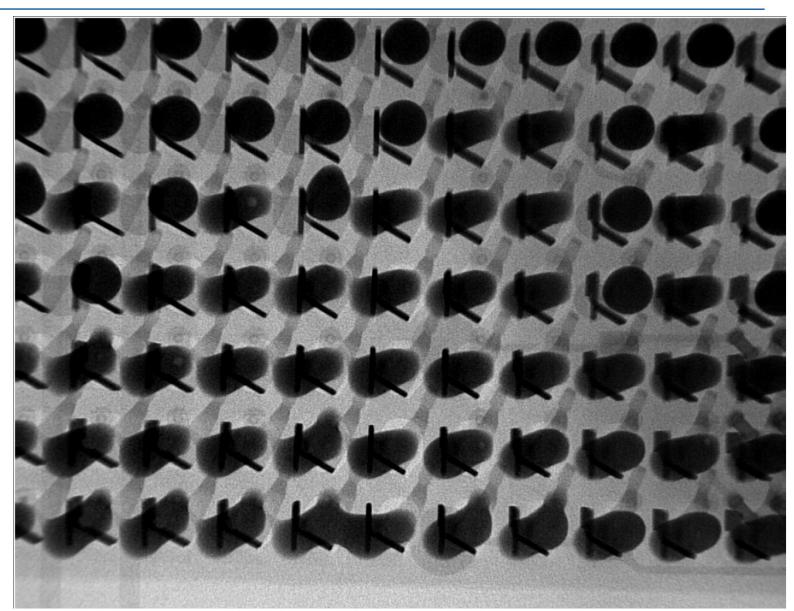






R+R 26 / Z – X-Ray nach Rework 1 mit Flussmittel – Sockel Detail

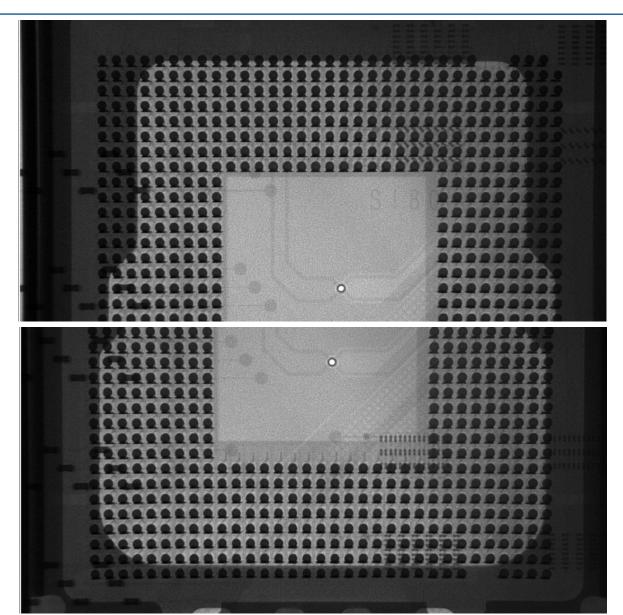






R+R 27 / Z - X-Ray vor Rework - Sockel



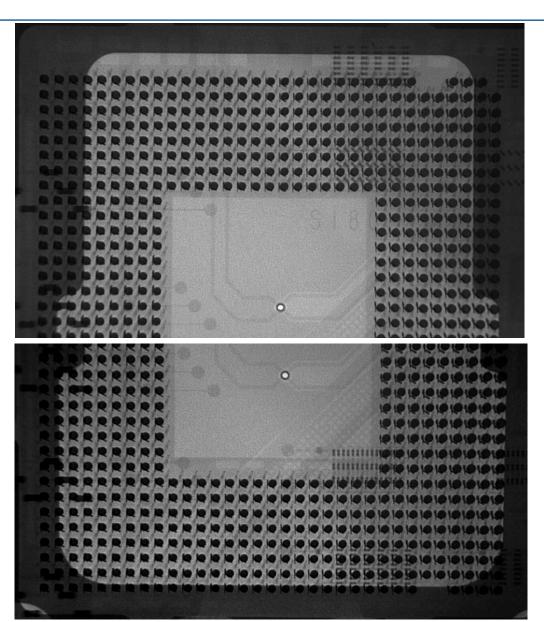






R+R 27 / Z – X-Ray nach Rework 1 mit Dip-Paste – Sockel

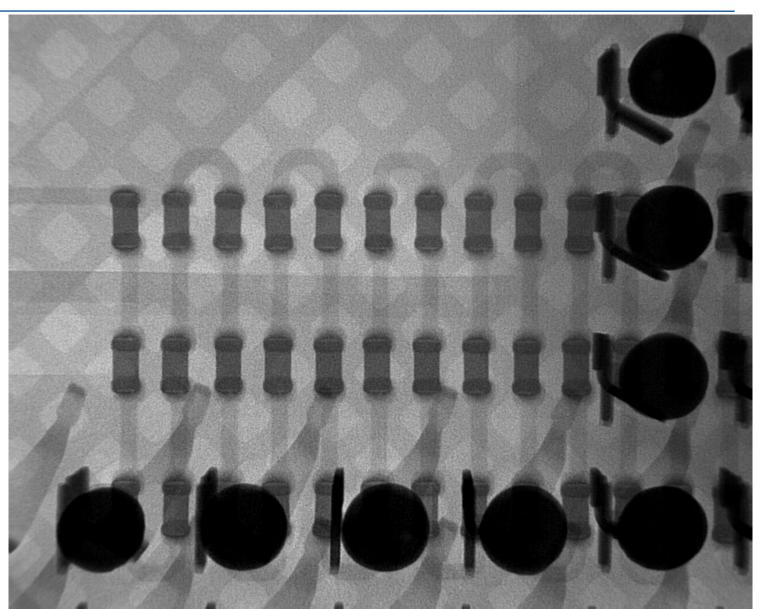






R+R 27 / Z – X-Ray nach Rework 1 mit Dip-Paste – Sockel Detail

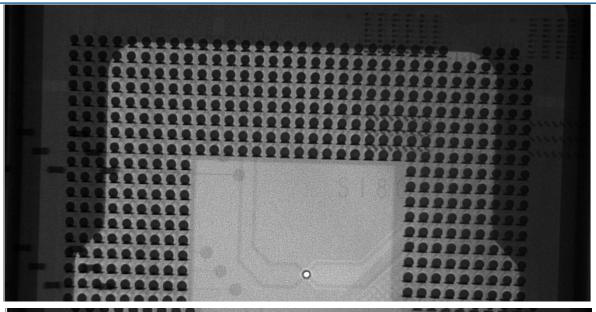




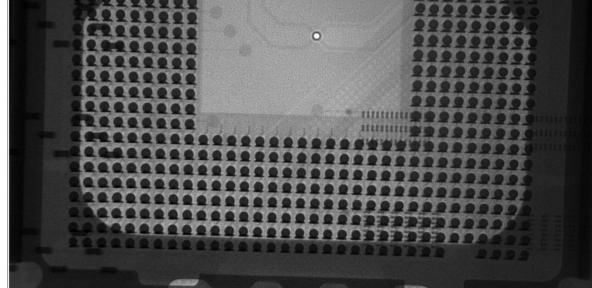


R+R 28 / Z - X-Ray vor Rework - Sockel



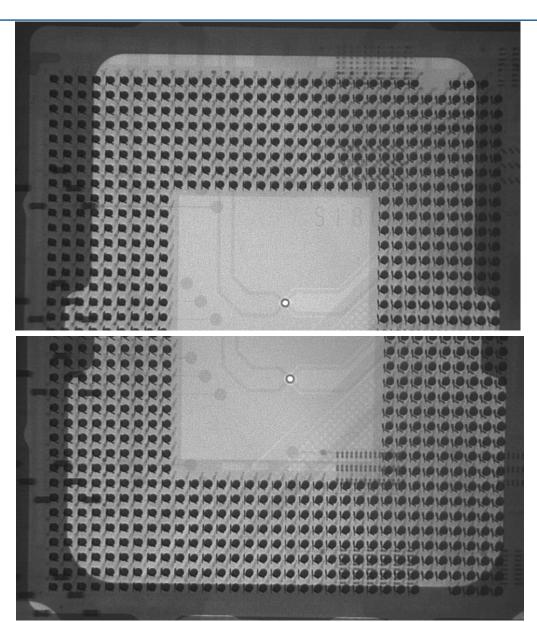






R+R 28 / Z – X-Ray nach Rework 1 mit Flussmittel – Sockel **ZVE**:



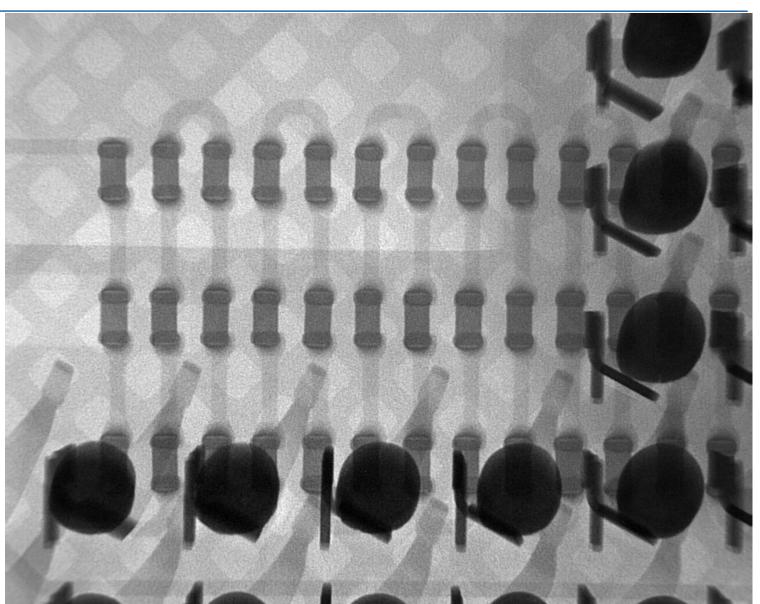






R+R 28 / Z – X-Ray nach Rework 1 mit Flussmittel – Sockel Detail

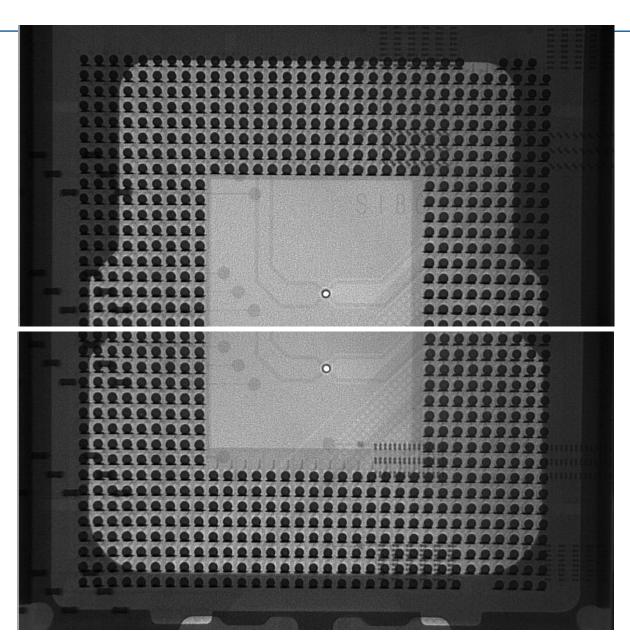






R+R 29 / Z - X-Ray vor Rework - Sockel



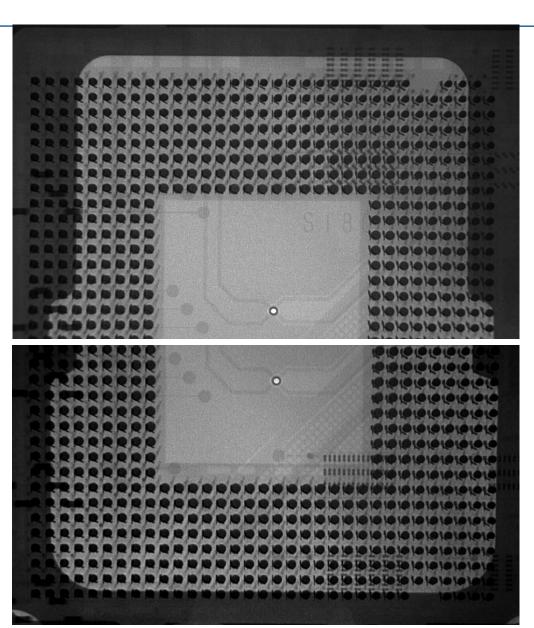






R+R 29 / Z – X-Ray nach Rework 1 mit Dip-Paste– Sockel

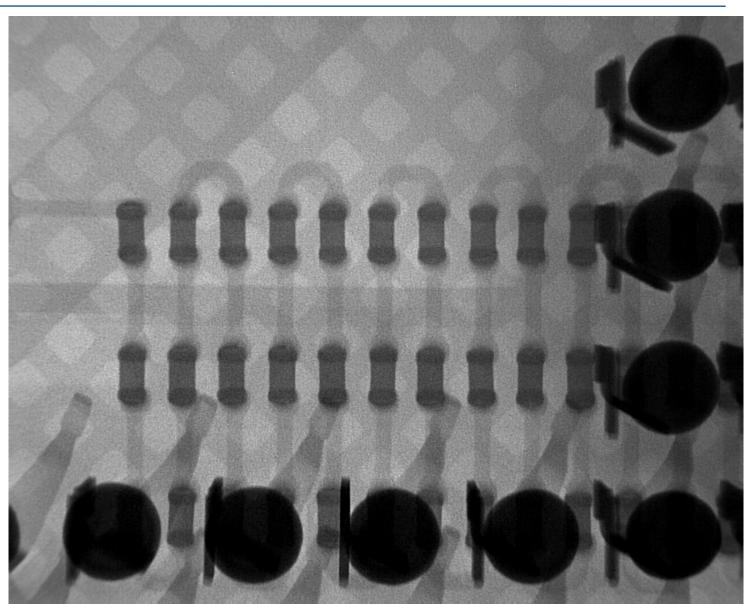






R+R 29 / Z – X-Ray nach Rework 1 mit Dip-Paste – Sockel Detail

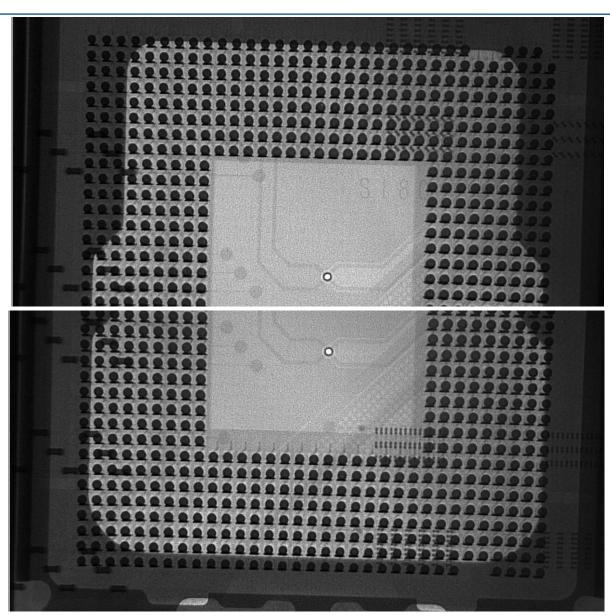






R+R 30 / Z - X-Ray vor Rework - Sockel



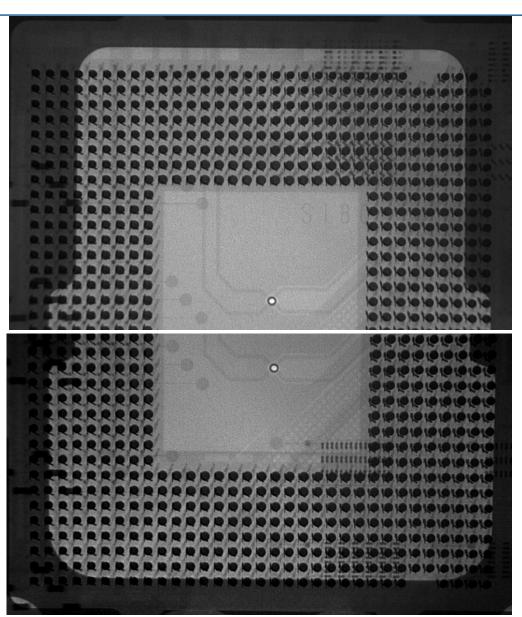






R+R 30 / Z - X-Ray nach Rework 1 mit Dip-Paste - Sockel

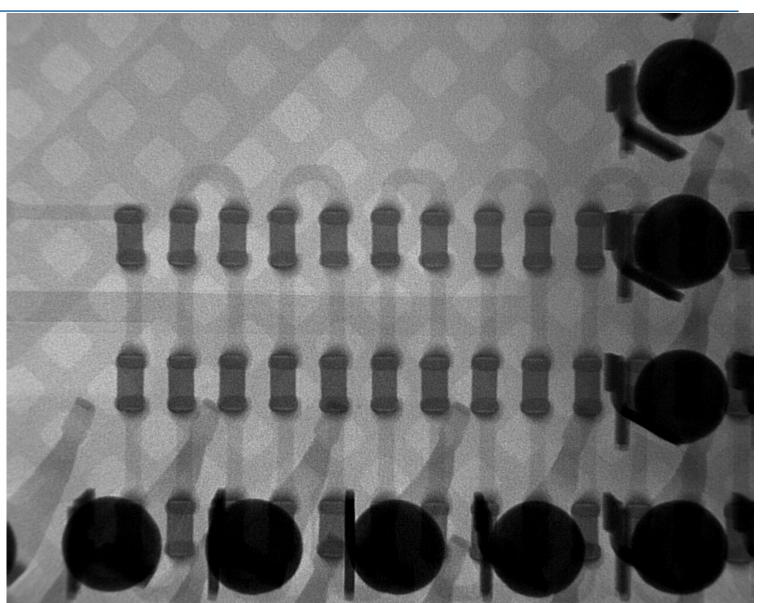






R+R 30 / Z – X-Ray nach Rework 1 mit Dip-Paste – Sockel Detail









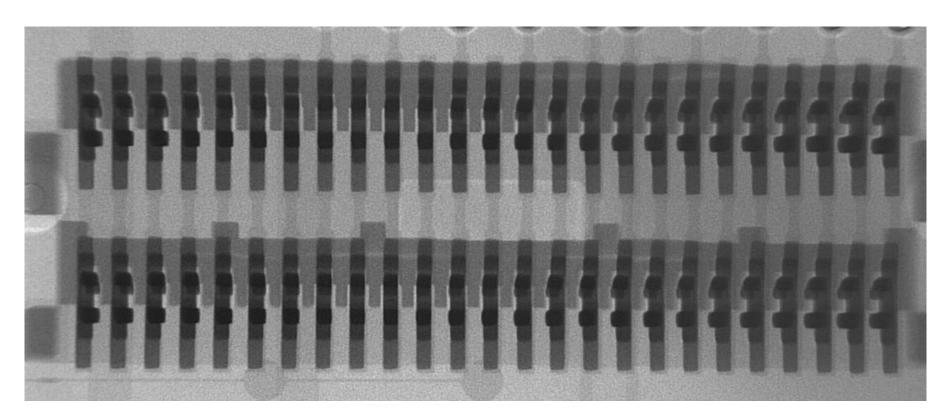
Stecker CONN_ERNI_114713

R+R 25 / Z – X-Ray nach Rework 3 – CONN_ERNI_114713







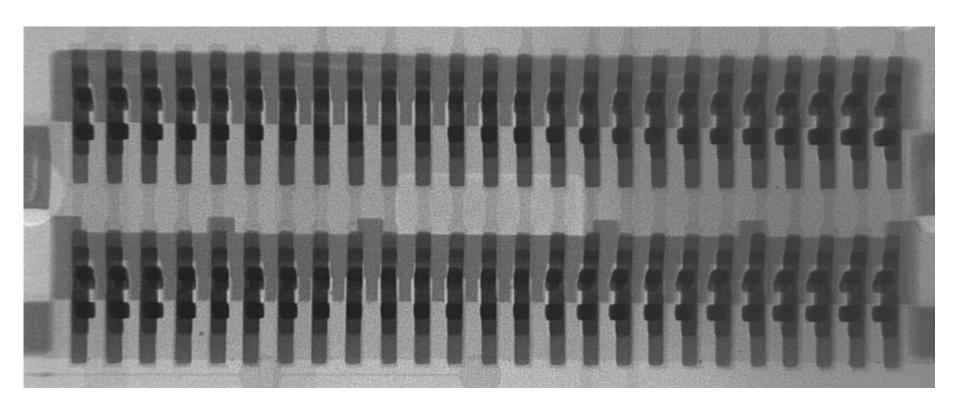


R+R 26 / Z – X-Ray nach Rework 2 – CONN_ERNI_114713







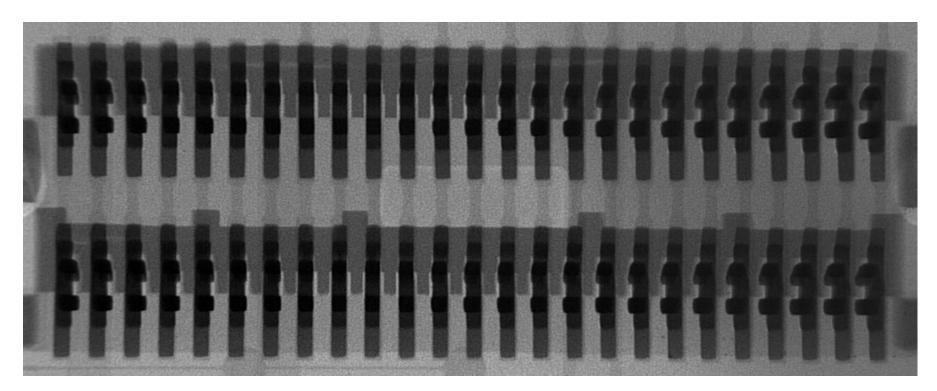


R+R 27 / Z – X-Ray nach Rework 1 – CONN_ERNI_114713







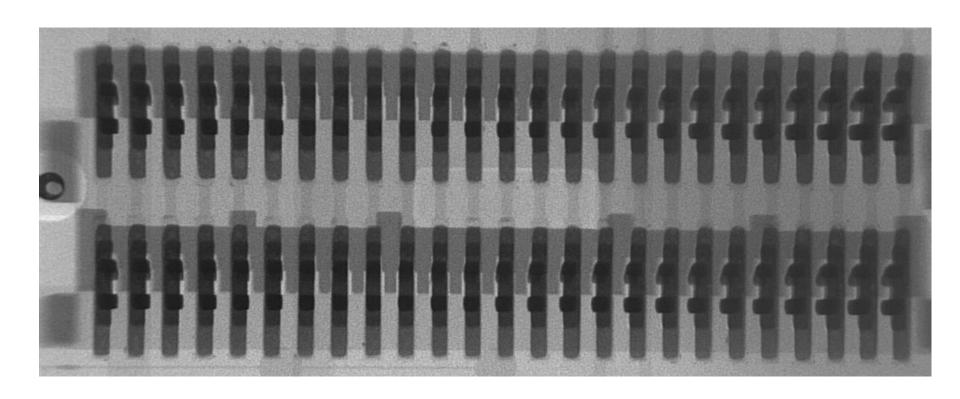


R+R 28 / Z – X-Ray nach Rework 3 – CONN_ERNI_114713







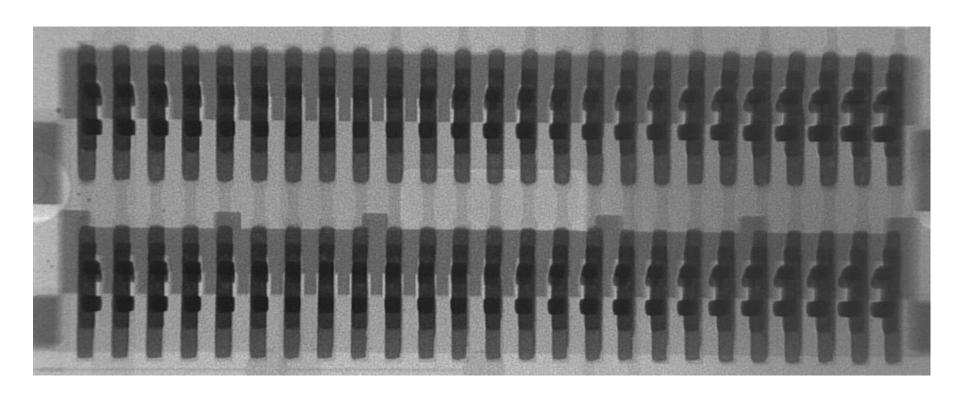


R+R 29 / Z – X-Ray nach Rework 2 – CONN_ERNI_114713







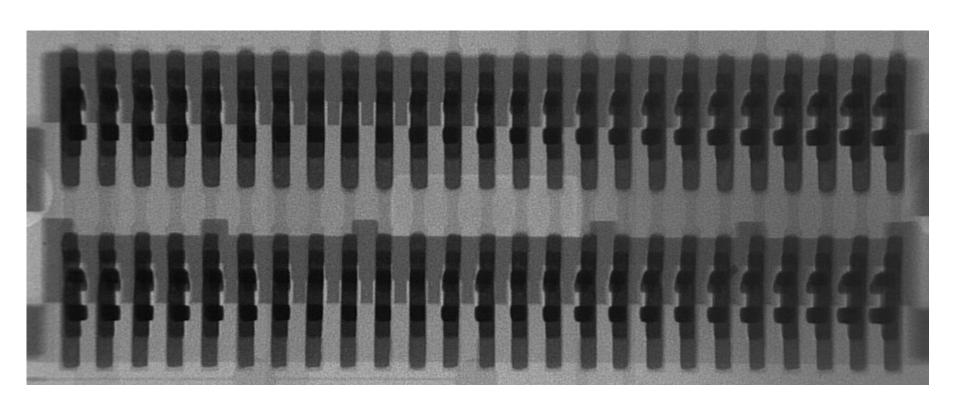


R+R 30 / Z – X-Ray nach Rework 1 – CONN_ERNI_114713







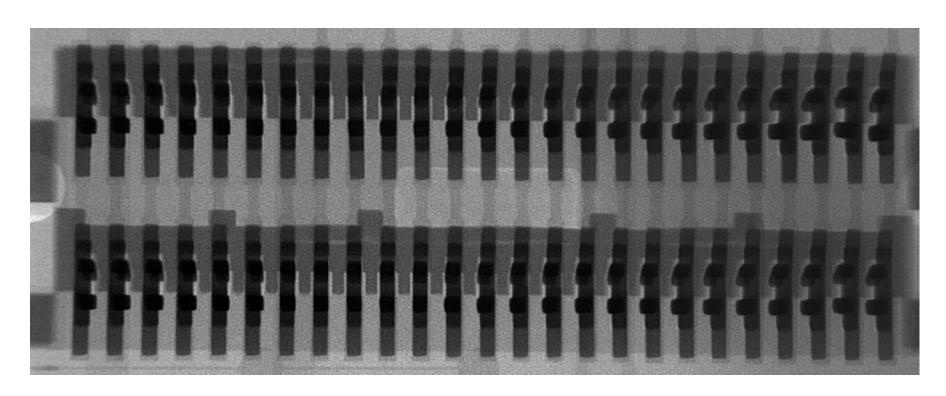


R+R 31 / Z – X-Ray nach Rework 3 – CONN_ERNI_114713







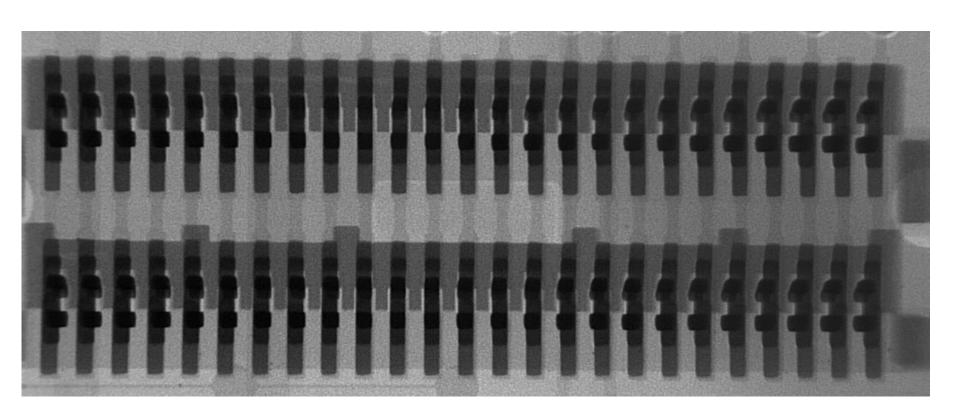


R+R 32 / Z – X-Ray nach Rework 2 – CONN_ERNI_114713







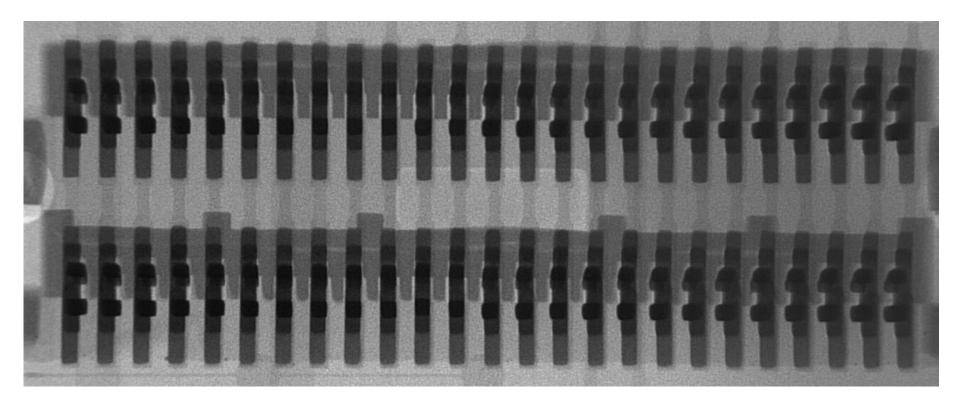


R+R 33 / Z - X-Ray nach Rework 1 - CONN_ERNI_114713







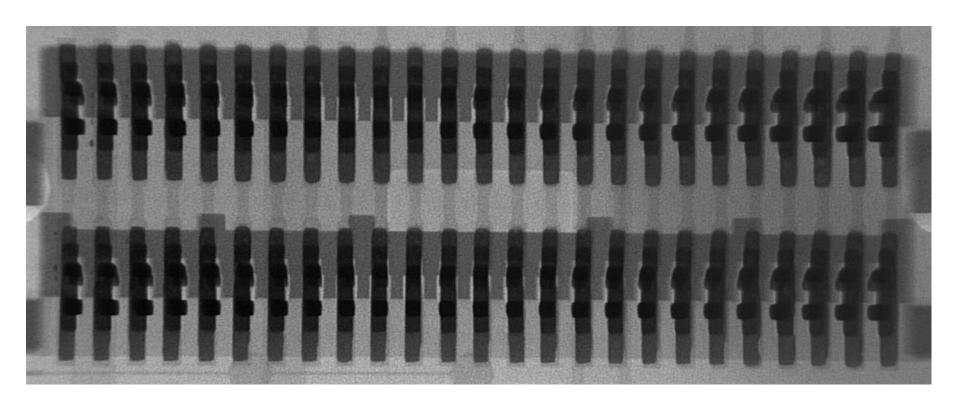


R+R 34 / Z – X-Ray nach Rework 3 – CONN_ERNI_114713







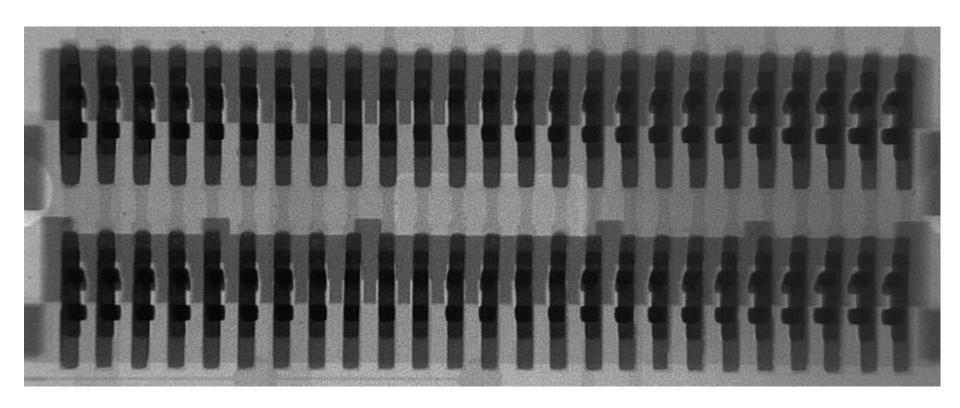


R+R 35 / Z – X-Ray nach Rework 2 – CONN_ERNI_114713





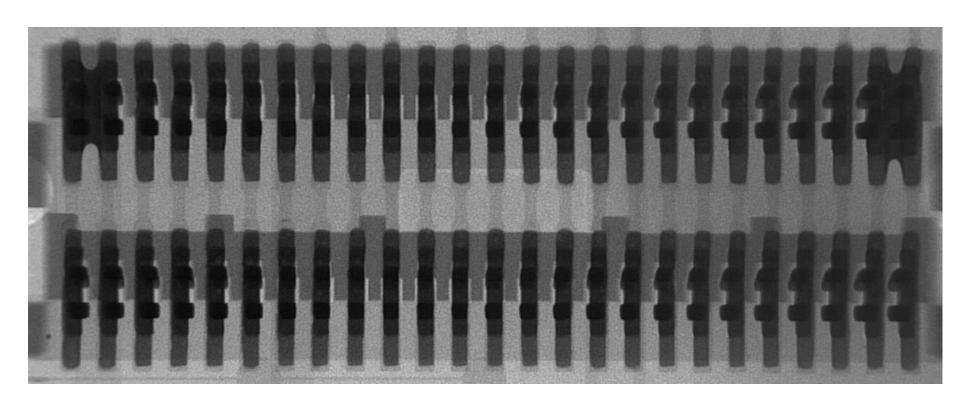




R+R 36 / Z – X-Ray nach Rework 1 – CONN_ERNI_114713





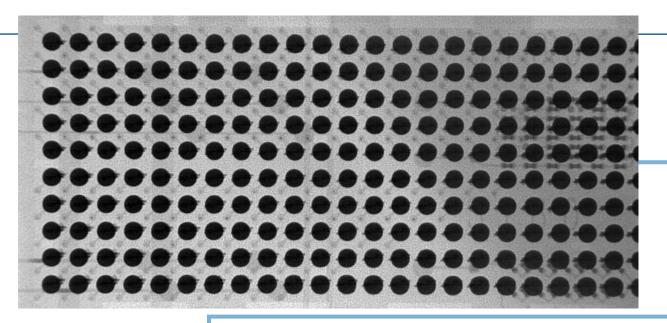




Stecker CONN_FCI_74390

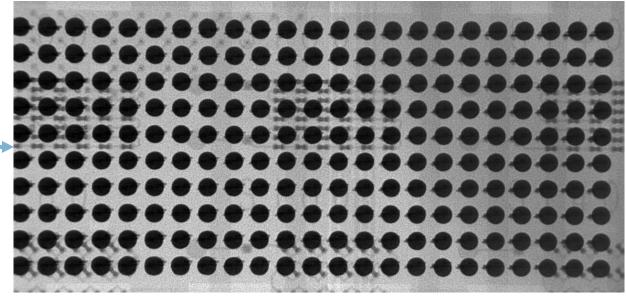
R+R 25 / Z – X-Ray nach Rework 1 – CONN_FCI_74390





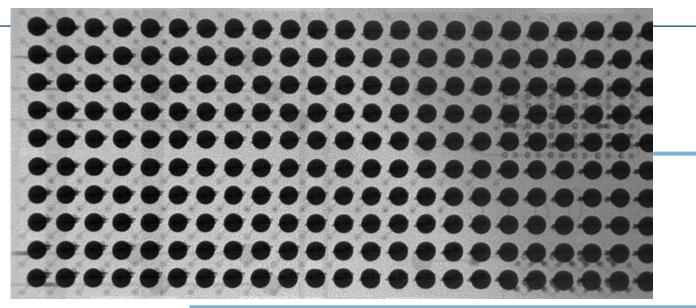






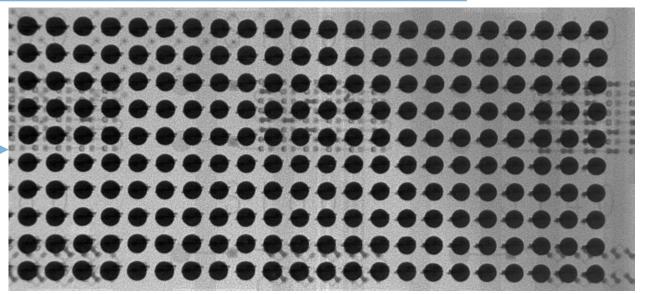
R+R 26 / Z – X-Ray nach Rework 1 – CONN_FCI_74390





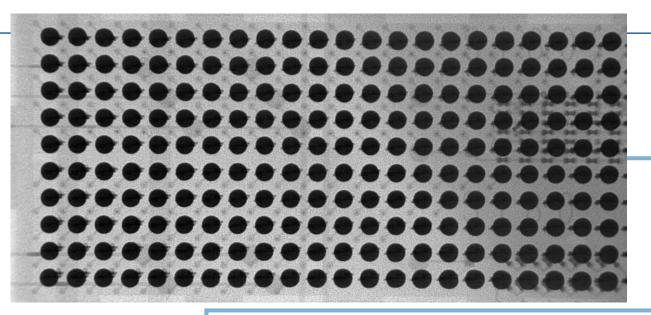






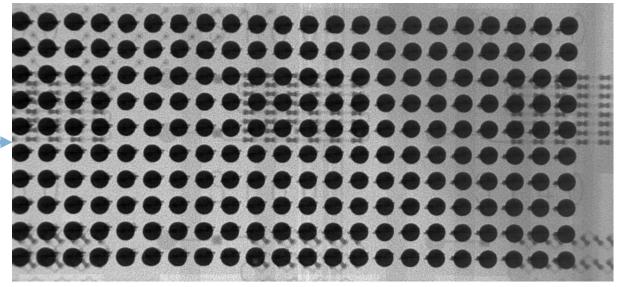
R+R 27 / Z - X-Ray nach Rework 1 - CONN_FCI_74390





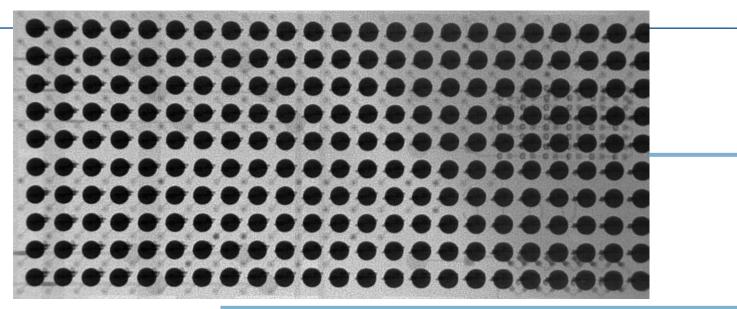






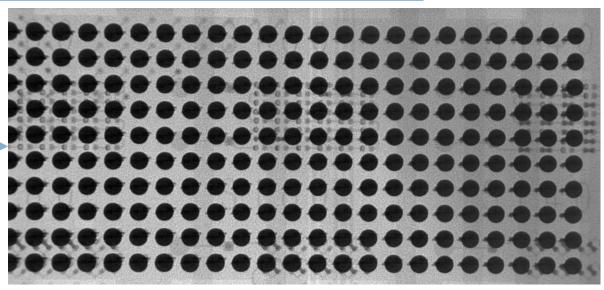
R+R 28 / Z - X-Ray nach Rework 1 - CONN_FCI_74390





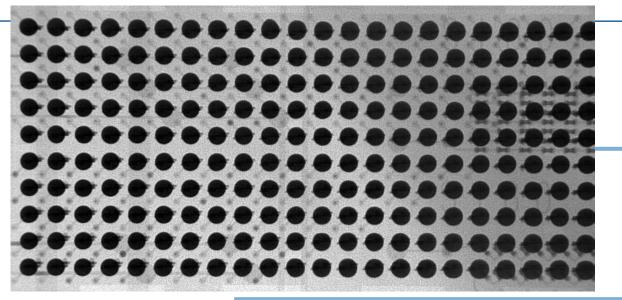






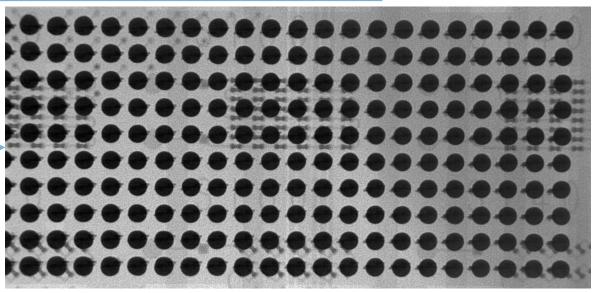
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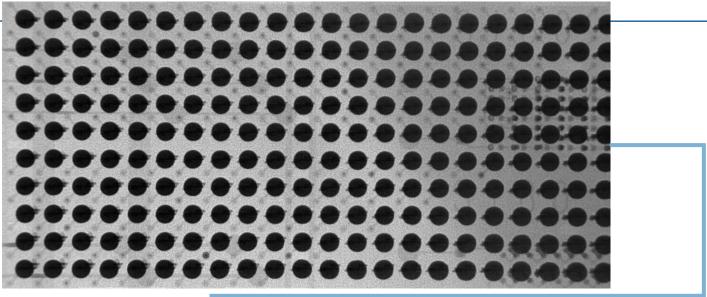






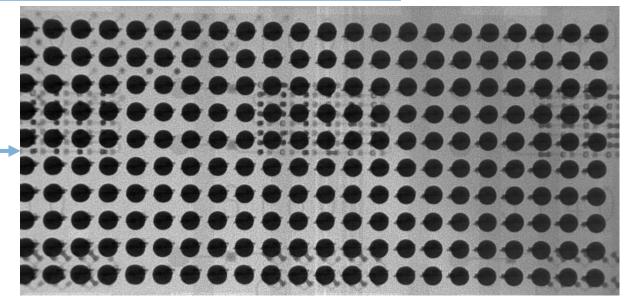
R+R 30 / Z - X-Ray nach Rework 1 - CONN_FCI_74390





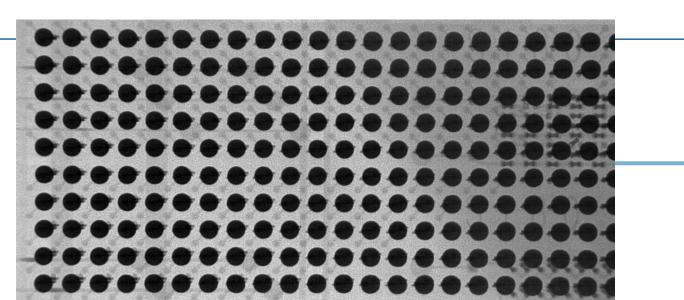






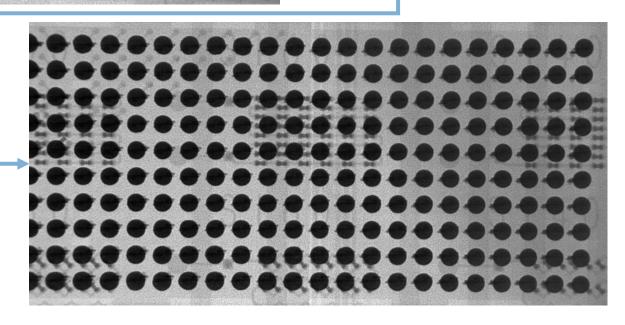
R+R 31 / Z – X-Ray nach Rework 1 – CONN_FCI_74390





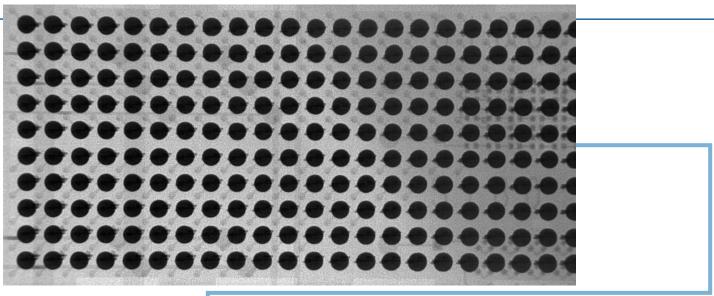






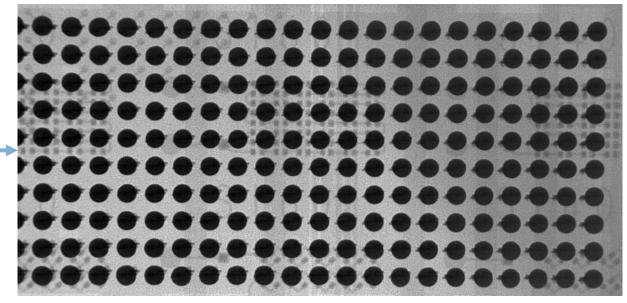
R+R 32 / Z - X-Ray nach Rework 1 - CONN_FCI_74390





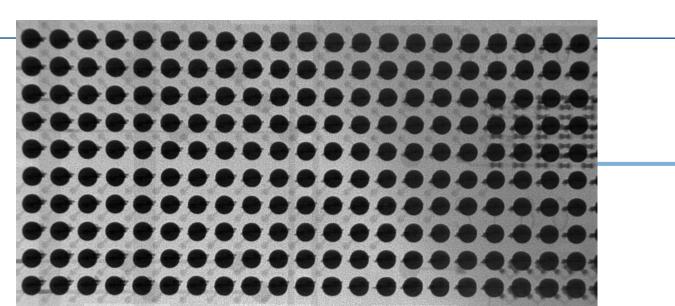






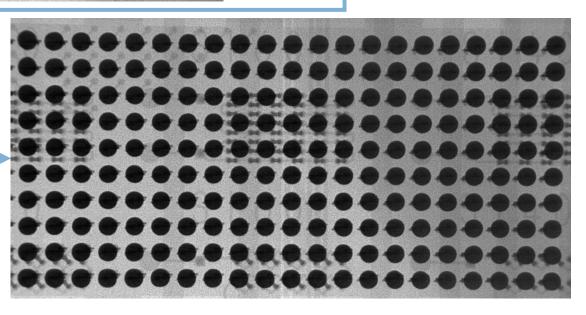
R+R 33 / Z – X-Ray nach Rework 1 – CONN_FCI_74390





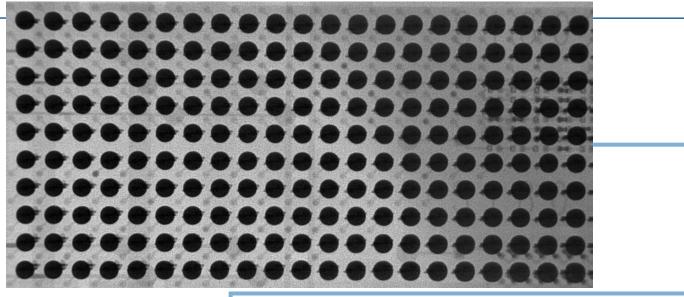






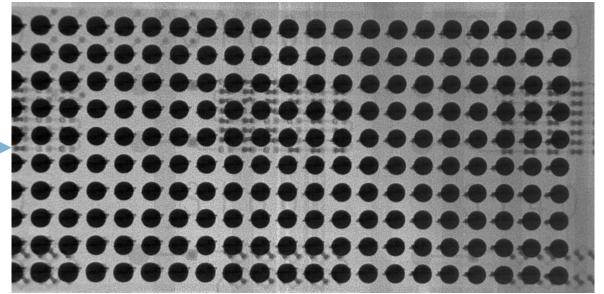
R+R 34 / Z - X-Ray nach Rework 1 - CONN_FCI_74390





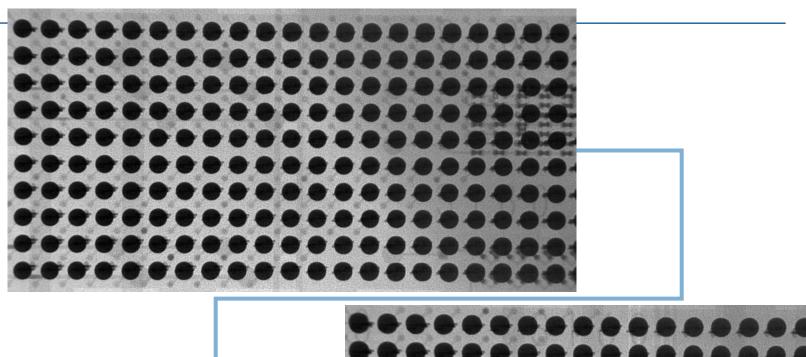






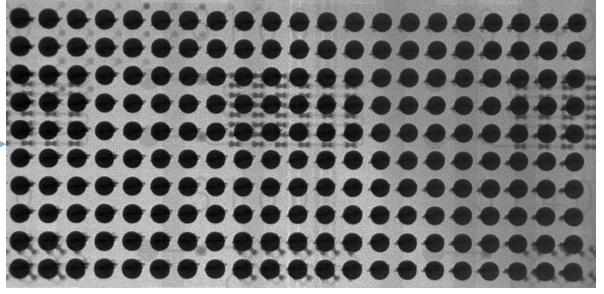
R+R 35 / Z – X-Ray nach Rework 1 – CONN_FCI_74390





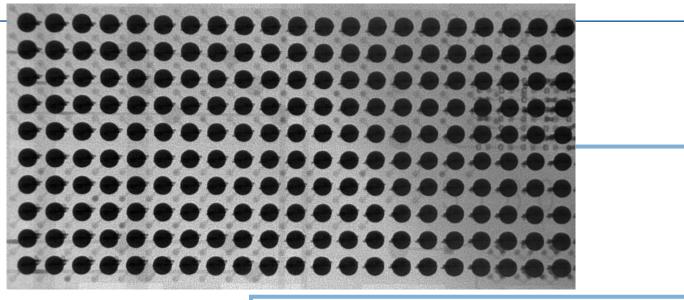






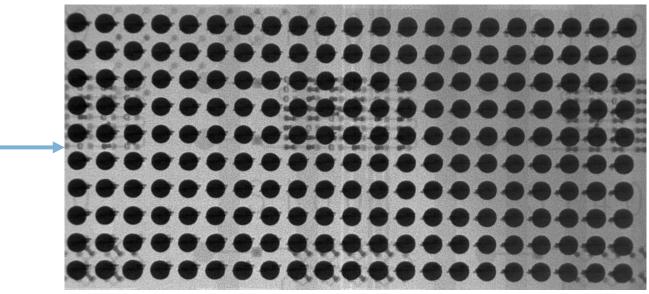
R+R 36 / Z – X-Ray nach Rework 1 – CONN_FCI_74390





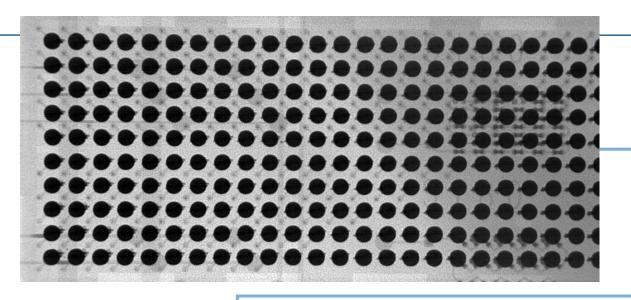






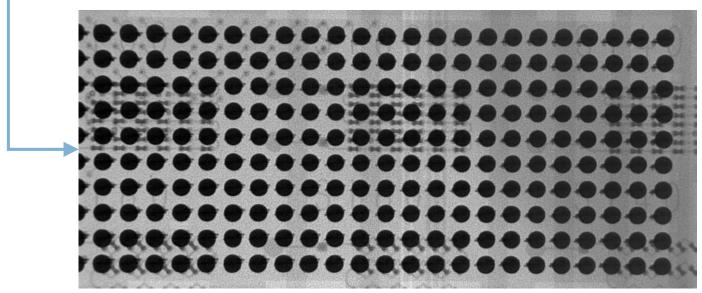
R+R 25 / Z – X-Ray nach Rework 3 – CONN_FCI_74390





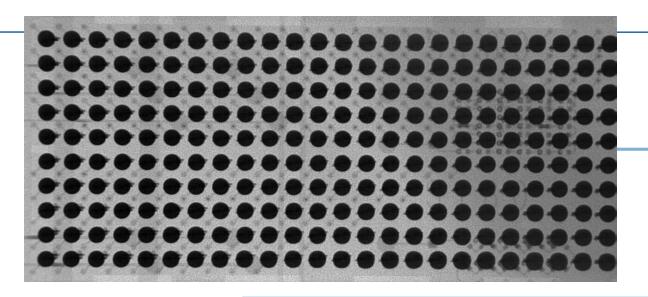






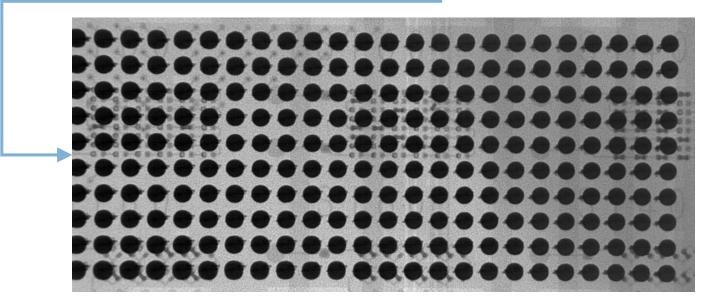
R+R 26 / Z – X-Ray nach Rework 2 – CONN_FCI_74390





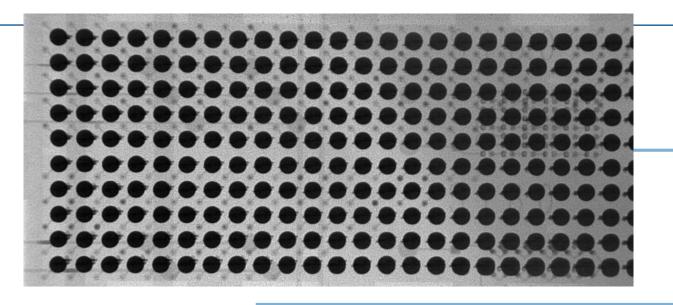






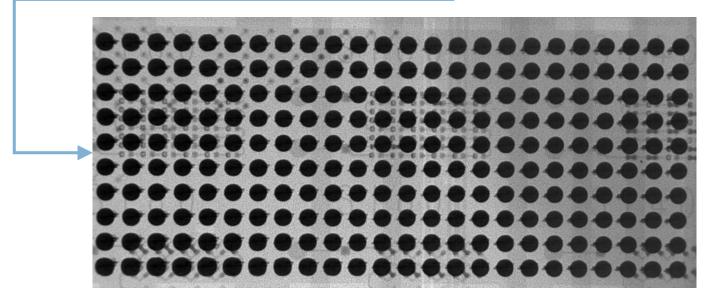
R+R 28 / Z - X-Ray nach Rework 3 - CONN_FCI_74390





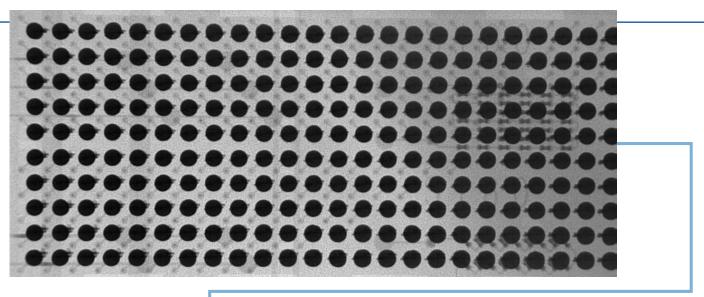






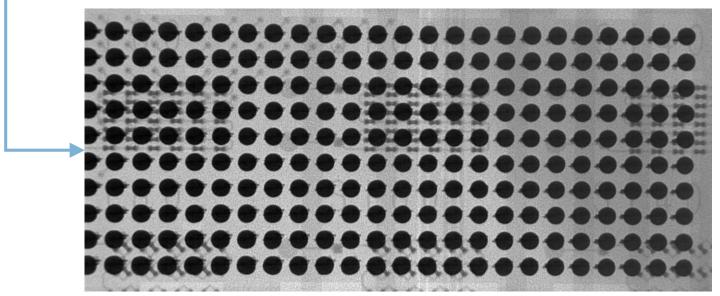
R+R 29 / Z – X-Ray nach Rework 2 – CONN_FCI_74390





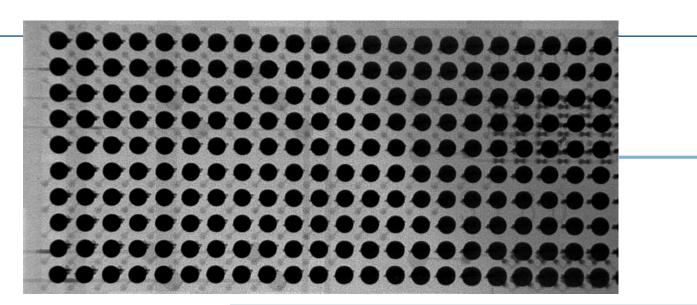






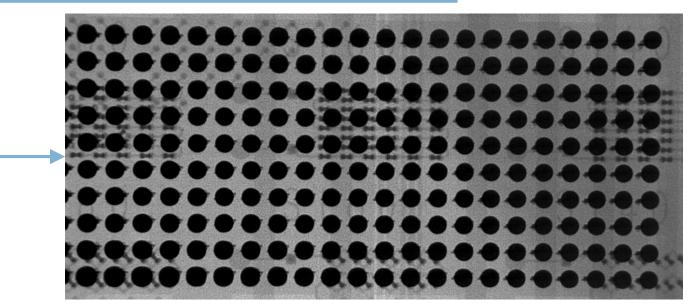
R+R 31 / Z – X-Ray nach Rework 3 – CONN_FCI_74390





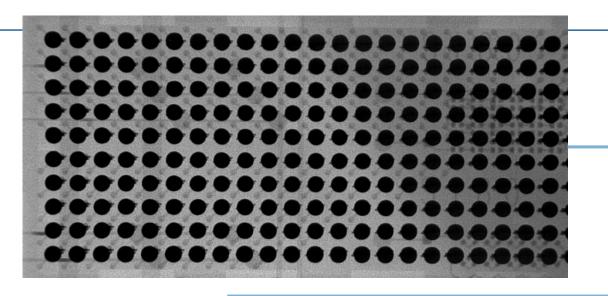






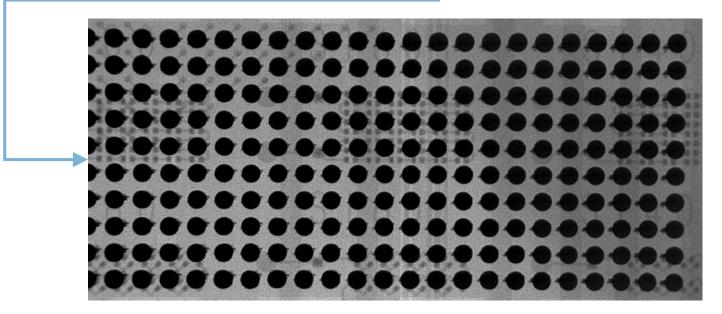
R+R 32 / Z - X-Ray nach Rework 2 - CONN_FCI_74390





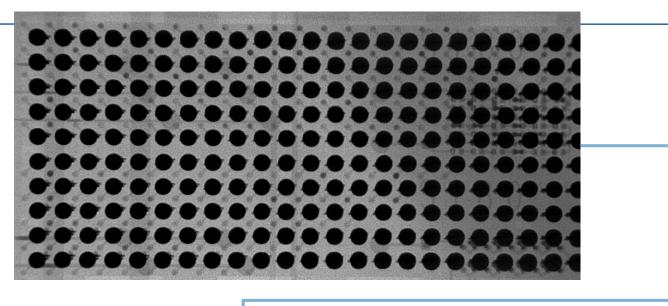






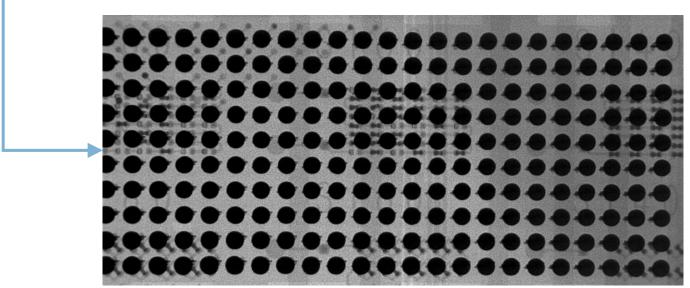
R+R 34 / Z - X-Ray nach Rework 3 - CONN_FCI_74390





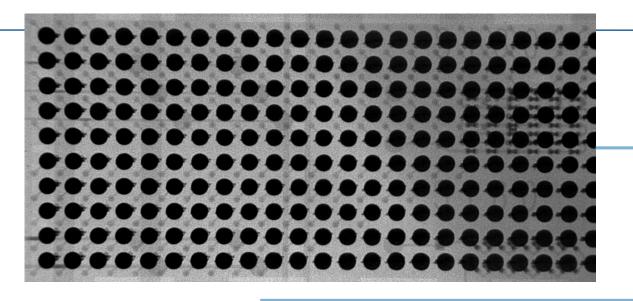




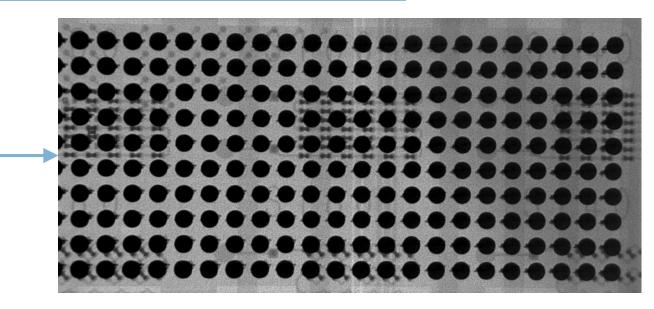


R+R 35 / Z – X-Ray nach Rework 2 – CONN_FCI_74390







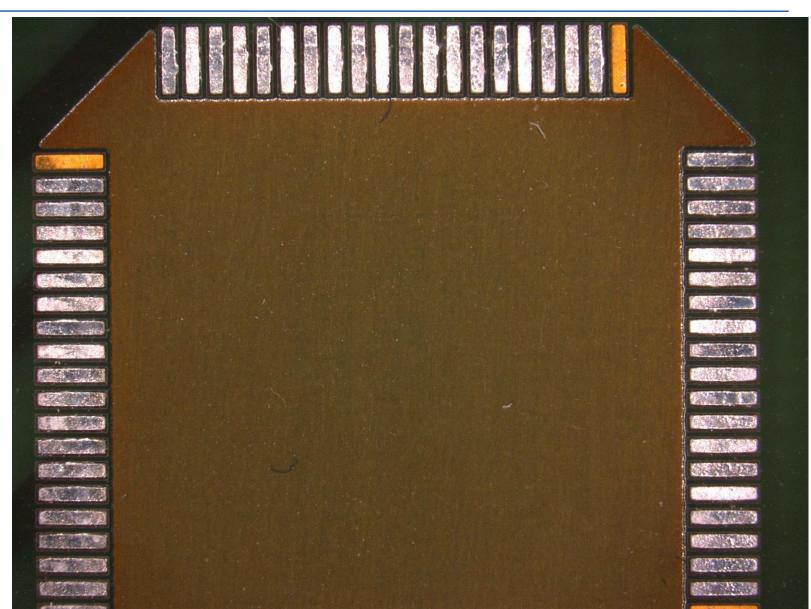




S-PQFP-G80

R+R 25 / Z – Optisch nach Ablöten – S-PQFP-G80



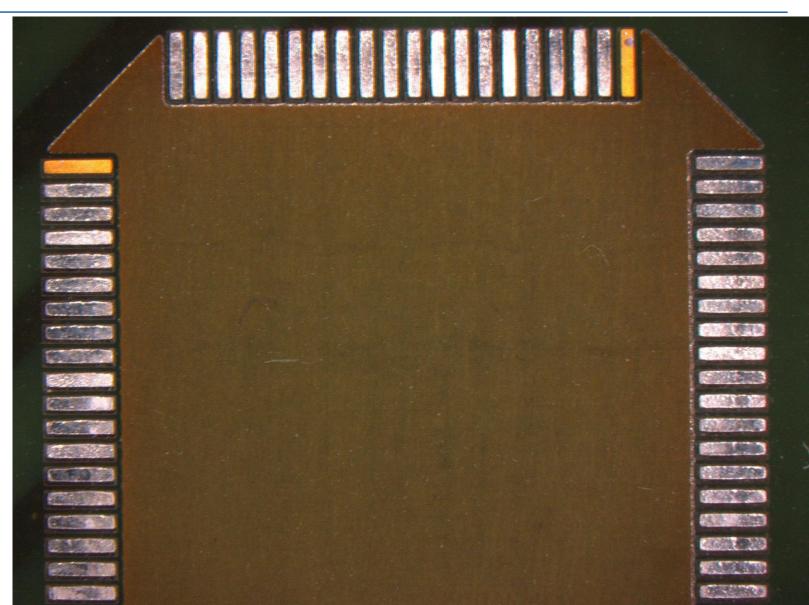






R+R 26 / Z – Optisch nach Ablöten – S-PQFP-G80



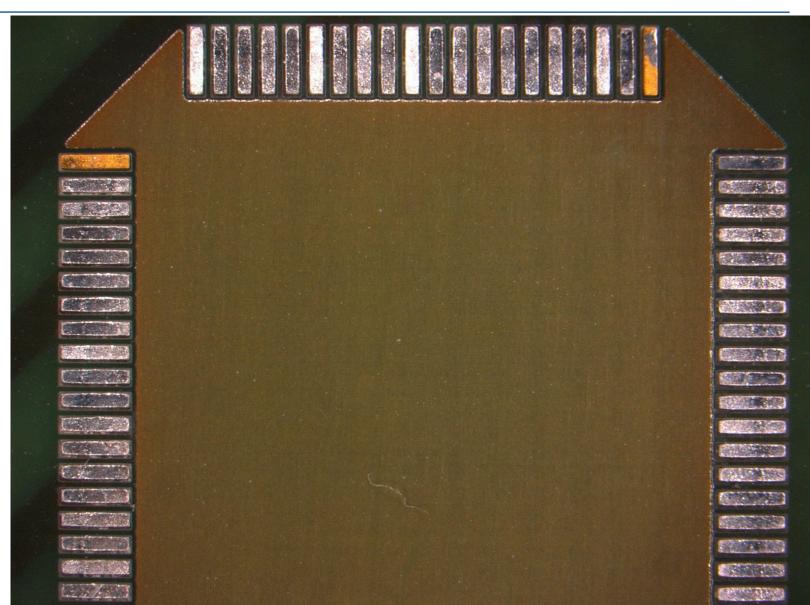






R+R 27 / Z – Optisch nach Ablöten – S-PQFP-G80



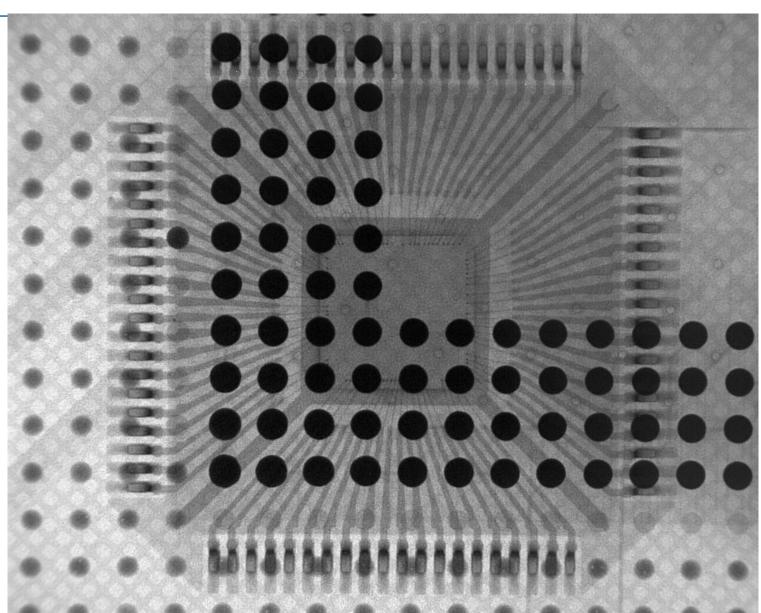






R+R 28 / Z - X-Ray nach Rework 3 - S-PQFP-G80



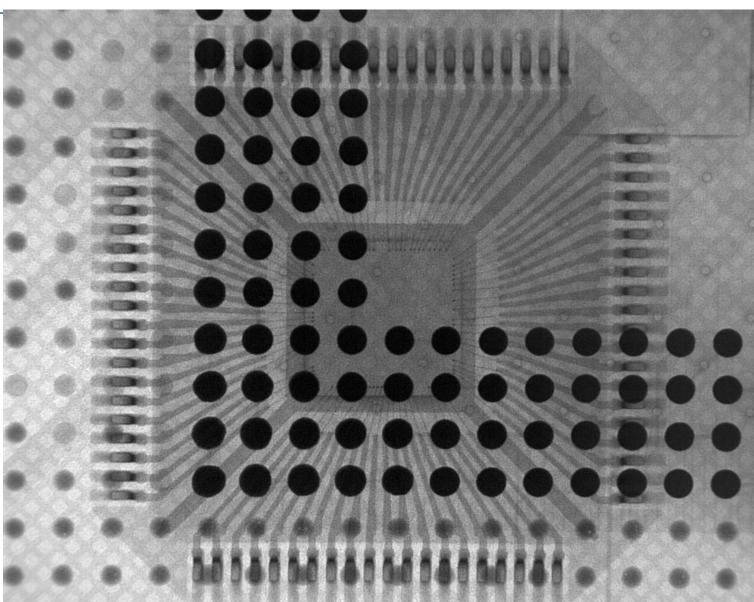






R+R 29 / Z – X-Ray nach Rework 2 – S-PQFP-G80



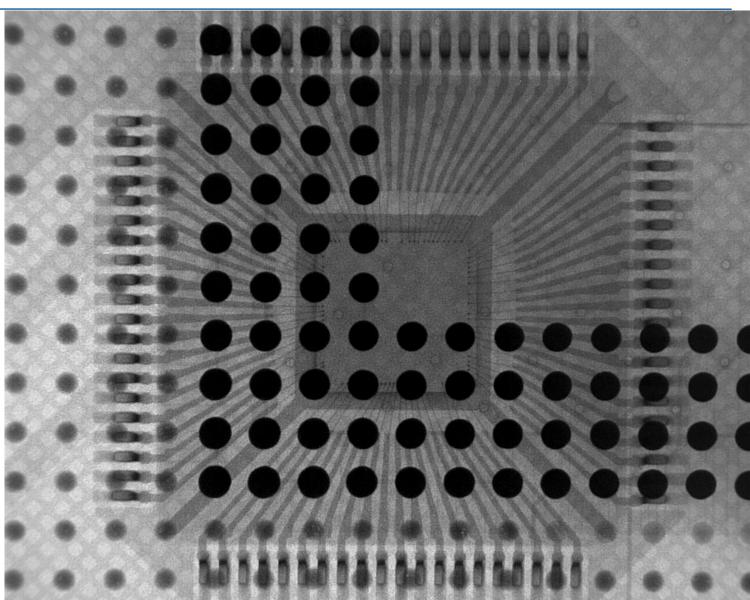






R+R 30 / Z - X-Ray nach Rework 1 - S-PQFP-G80



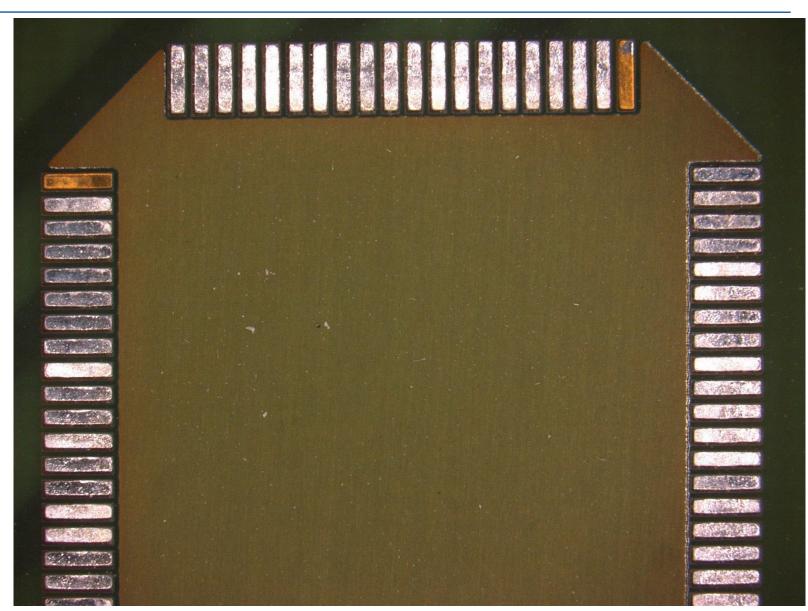






R+R 31 / Z – Optisch nach Ablöten – S-PQFP-G80



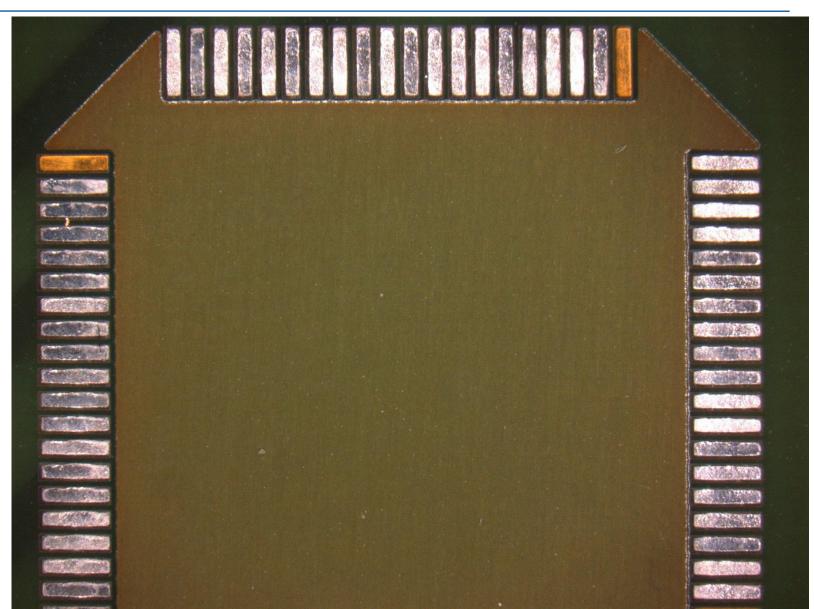






R+R 32 / Z – Optisch nach Ablöten – S-PQFP-G80



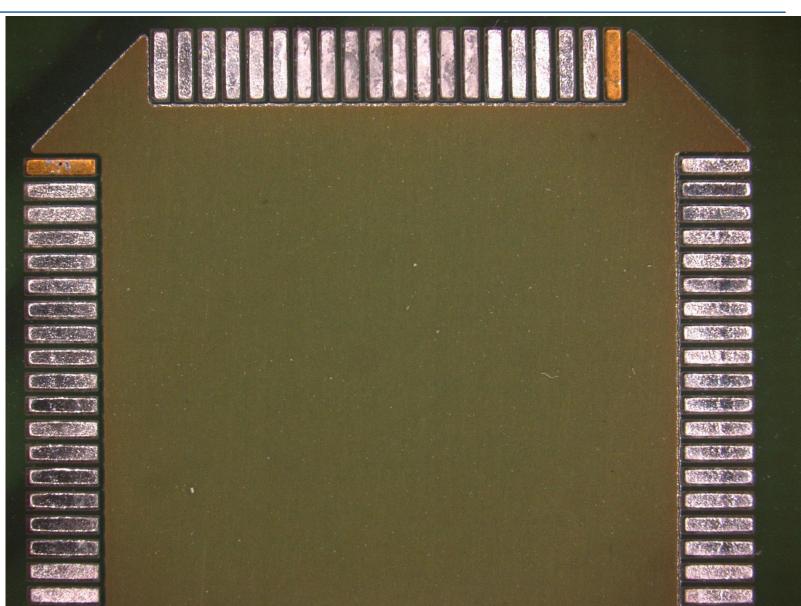






R+R 33 / Z – Optisch nach Ablöten – S-PQFP-G80



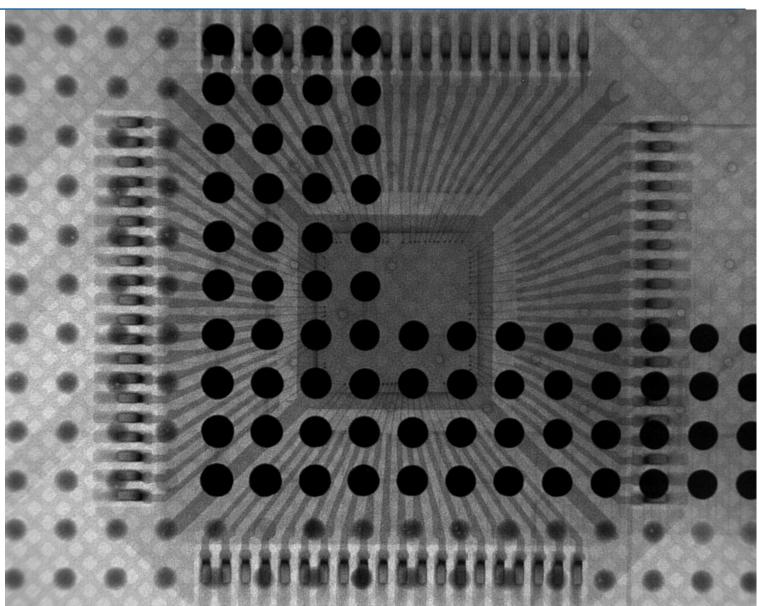






R+R 34 / Z - X-Ray nach Rework 3 - S-PQFP-G80



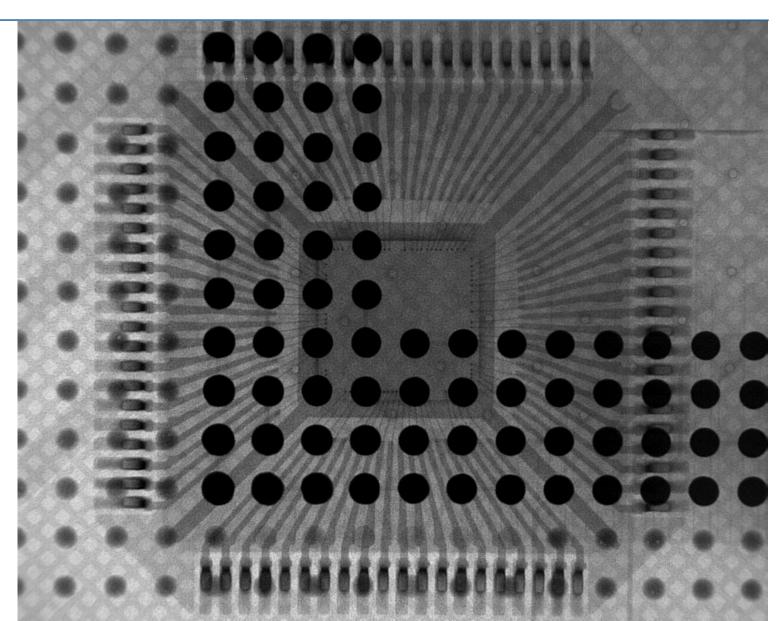






R+R 35 / Z – X-Ray nach Rework 2 – S-PQFP-G80



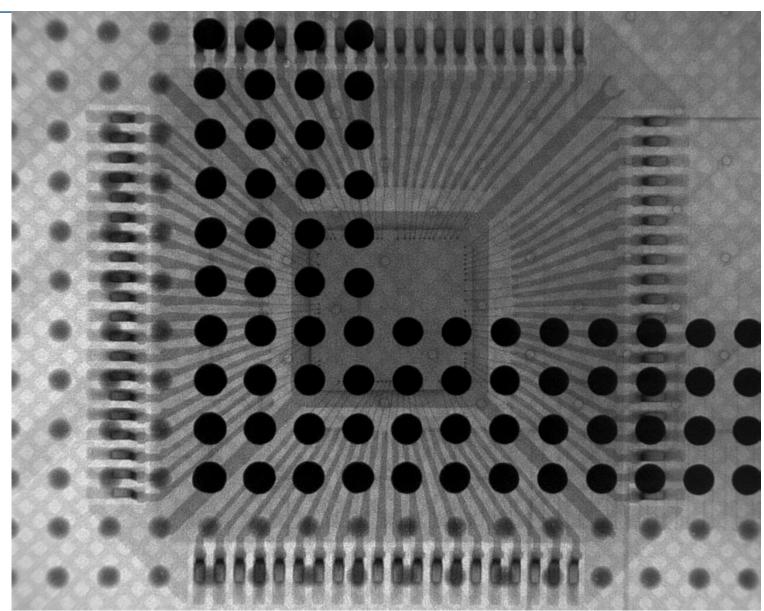






R+R 36 / Z – X-Ray nach Rework 1 – S-PQFP-G80





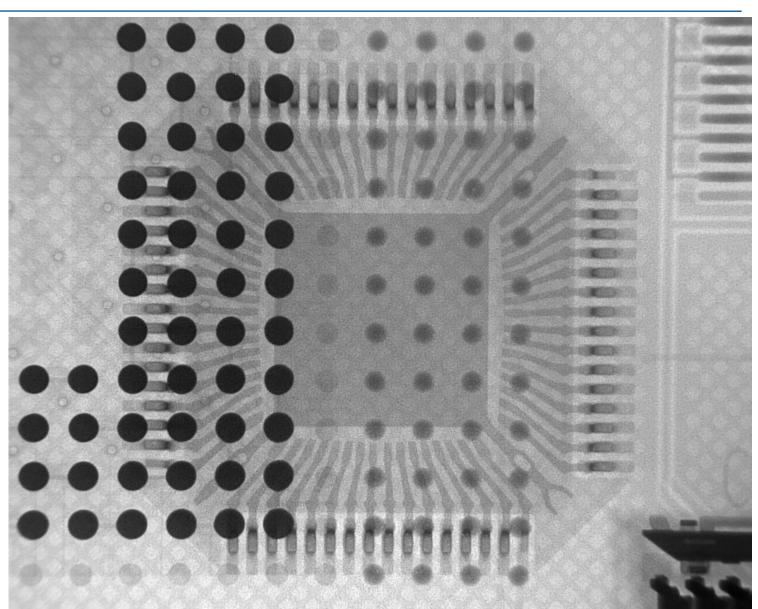




S-PQFP-G64

R+R 25 / Z - X-Ray vor Rework - S-PQFP-G64



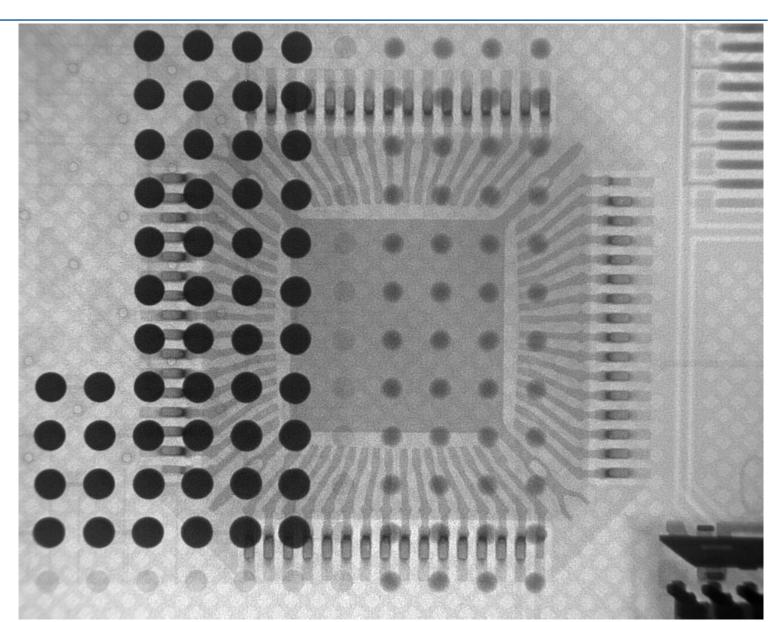






R+R 26 / Z - X-Ray vor Rework - S-PQFP-G64



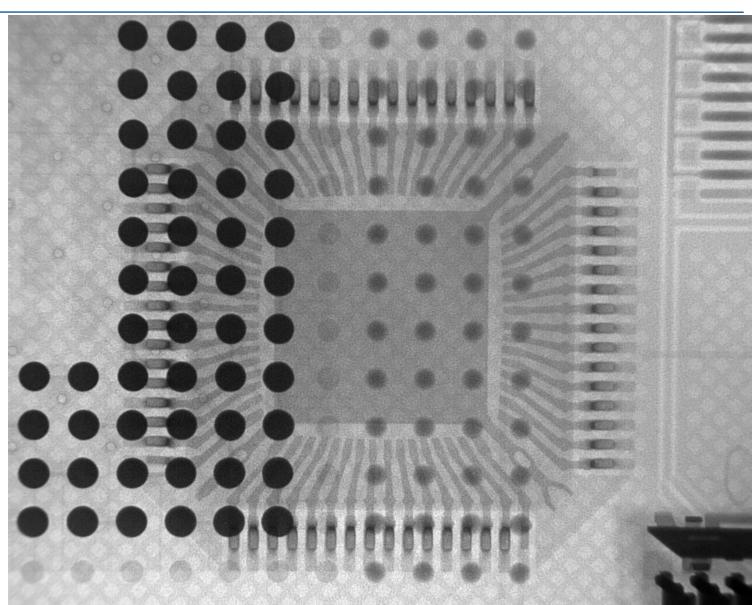






R+R 27 / Z - X-Ray vor Rework - S-PQFP-G64



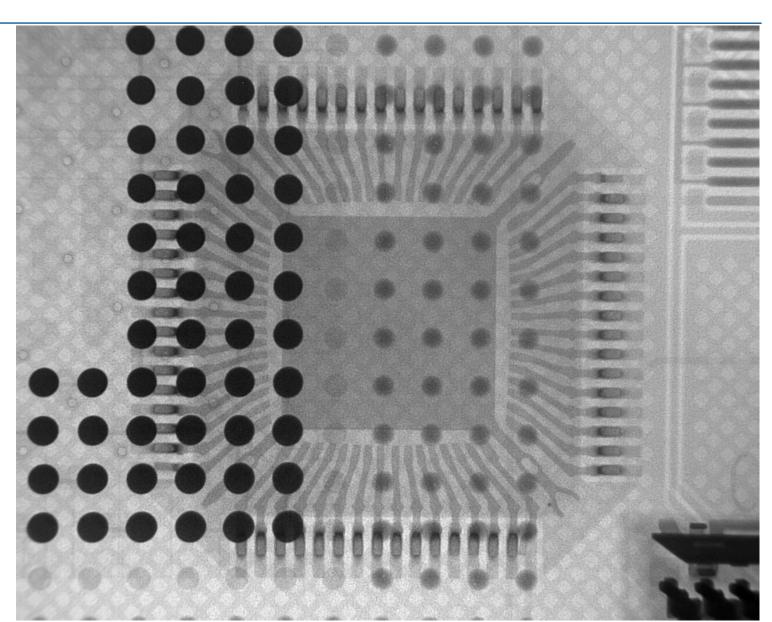






R+R 31 / Z - X-Ray vor Rework - S-PQFP-G64



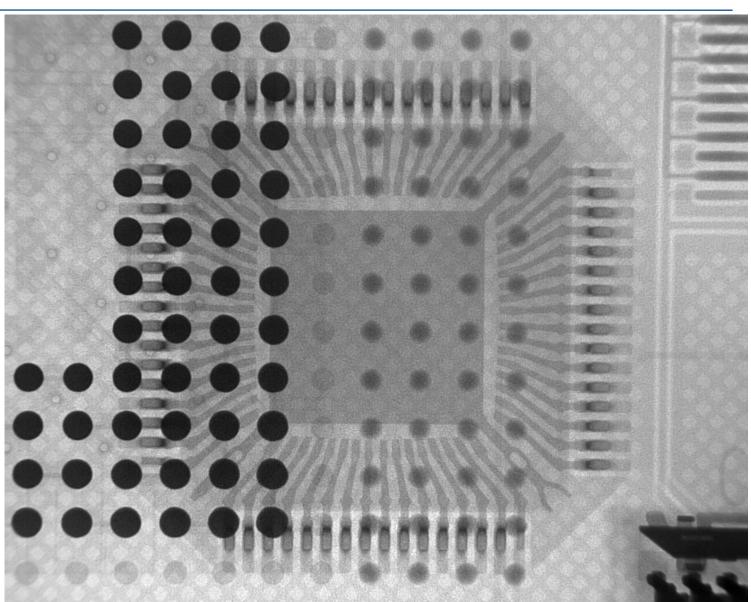






R+R 32 / Z - X-Ray vor Rework - S-PQFP-G64



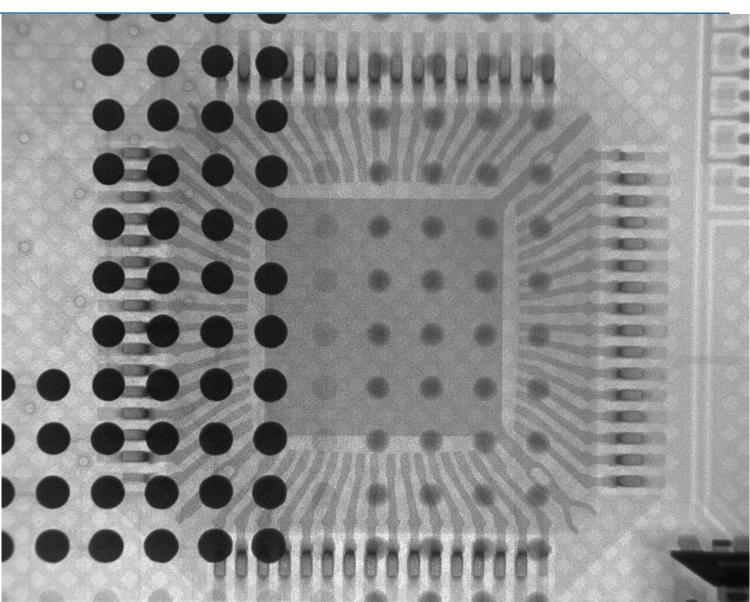






R+R 33 / Z - X-Ray vor Rework - S-PQFP-G64

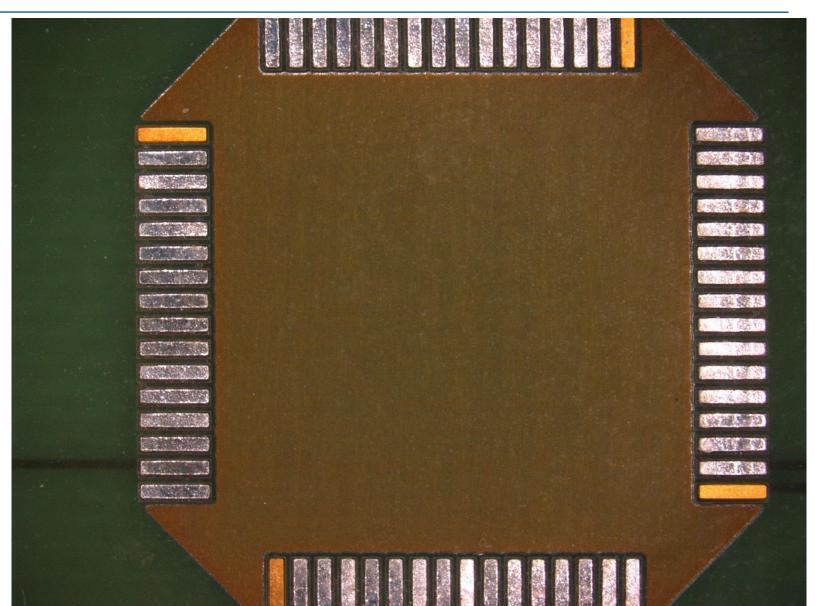






R+R 25 / Z – Optisch nach Absaugen – S-PQFP-G64



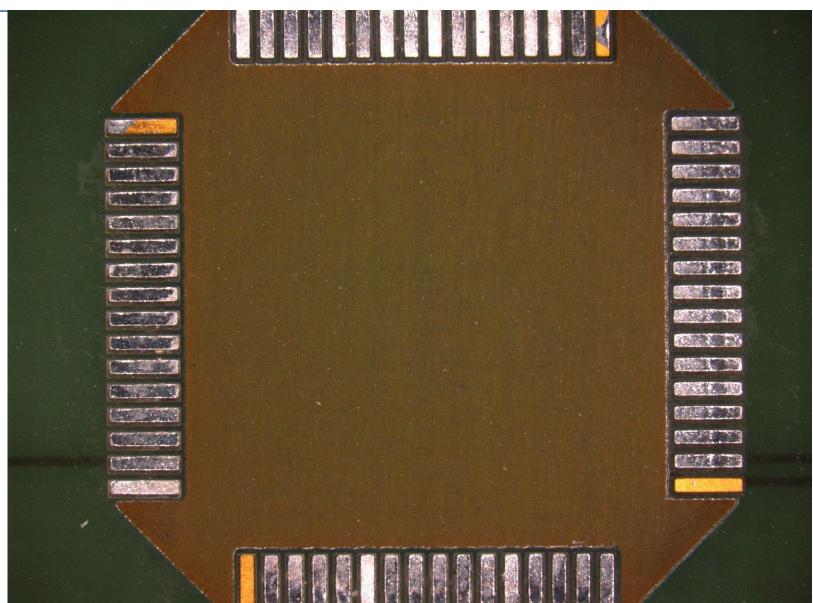






R+R 26 / Z – Optisch nach Absaugen – S-PQFP-G64



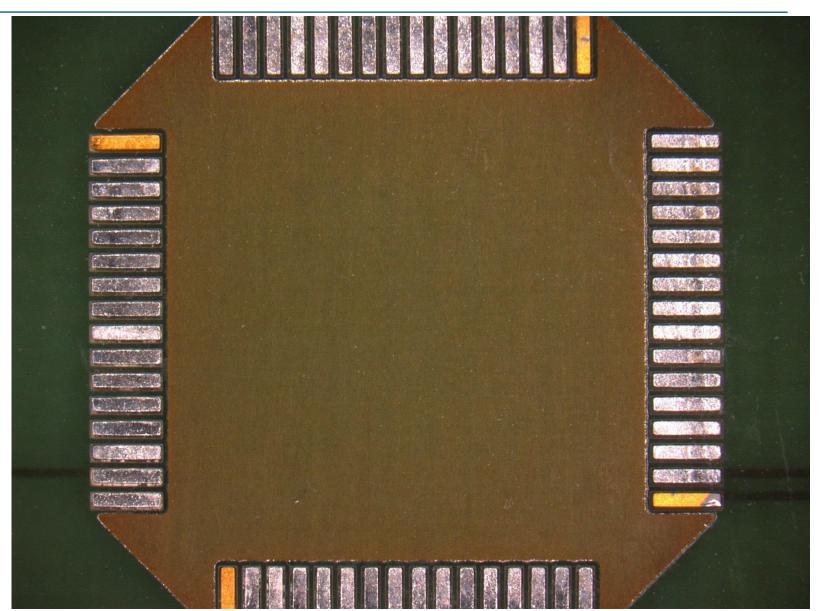






R+R 27 / Z – Optisch nach Absaugen – S-PQFP-G64



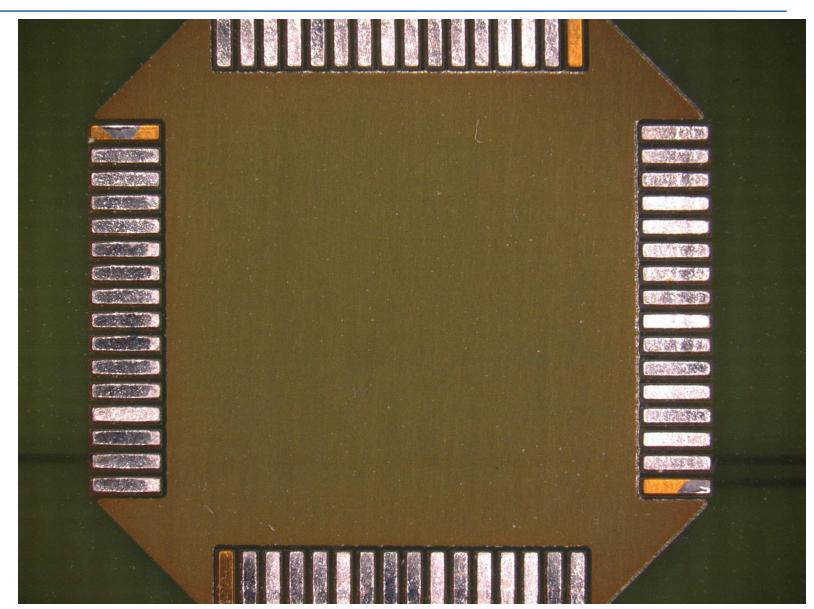






R+R 31 / Z – Optisch nach Absaugen – S-PQFP-G64



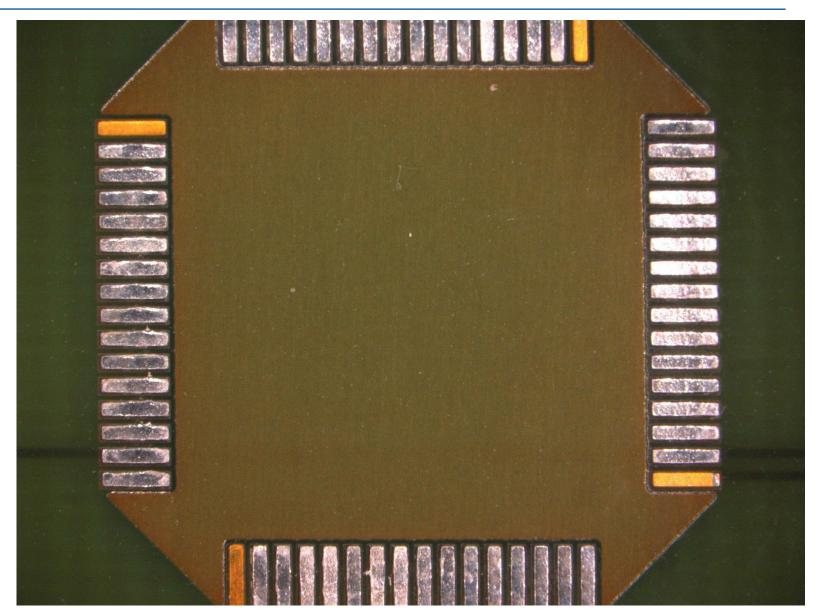






R+R 32 / Z – Optisch nach Absaugen – S-PQFP-G64



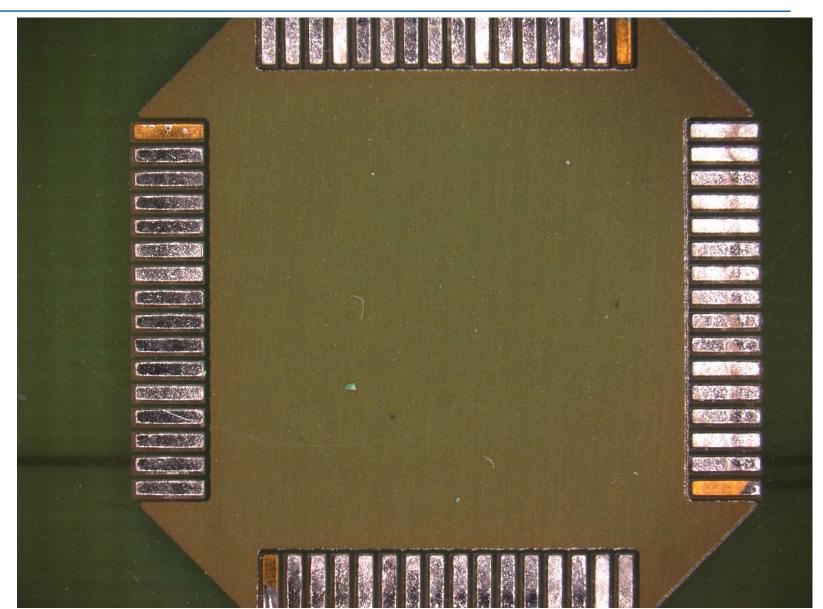






R+R 33 / Z – Optisch nach Absaugen – S-PQFP-G64

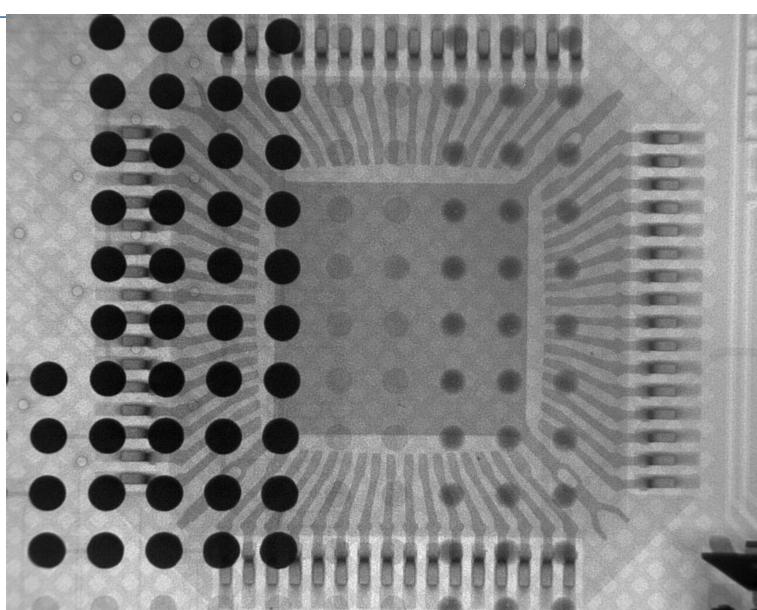






R+R 28 / Z - X-Ray nach Rework 3 - S-PQFP-G64



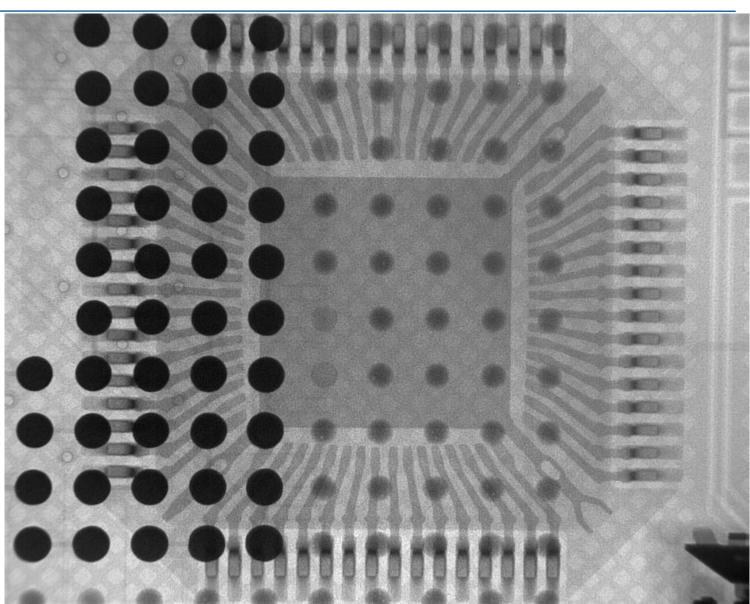






R+R 29 / Z - X-Ray nach Rework 2 - S-PQFP-G64



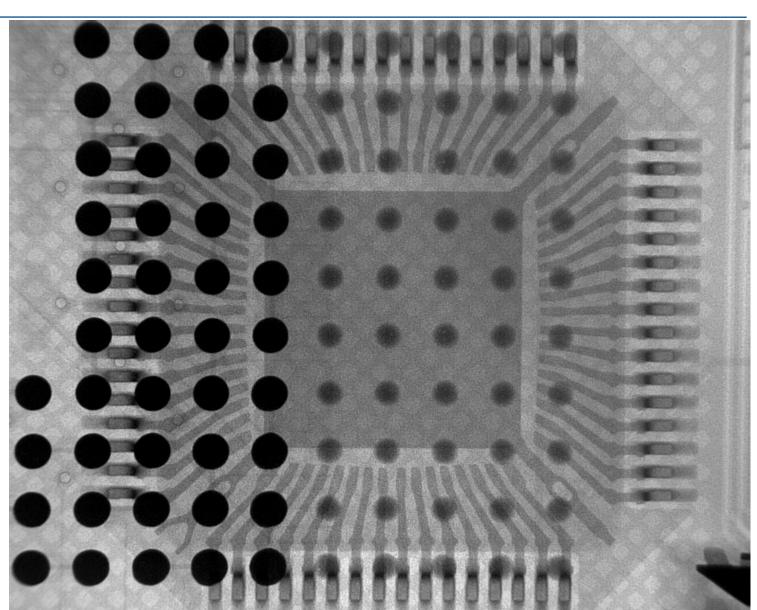






R+R 30 / Z - X-Ray nach Rework 1 - S-PQFP-G64



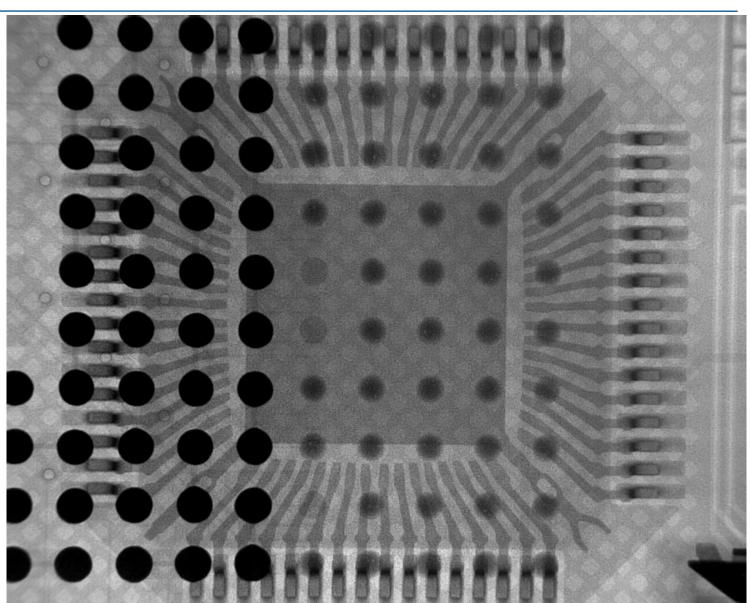






R+R 34 / Z - X-Ray nach Rework 3 - S-PQFP-G64



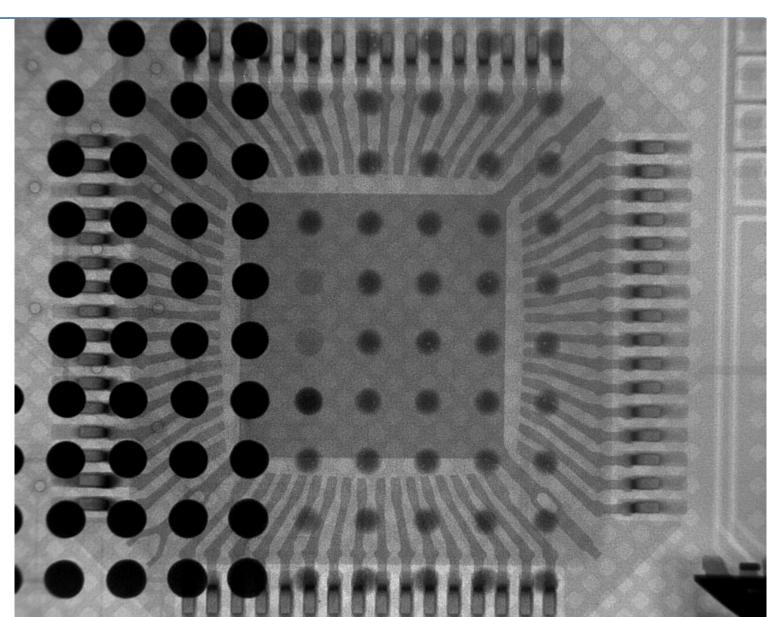






R+R 35 / Z – X-Ray nach Rework 2 – S-PQFP-G64



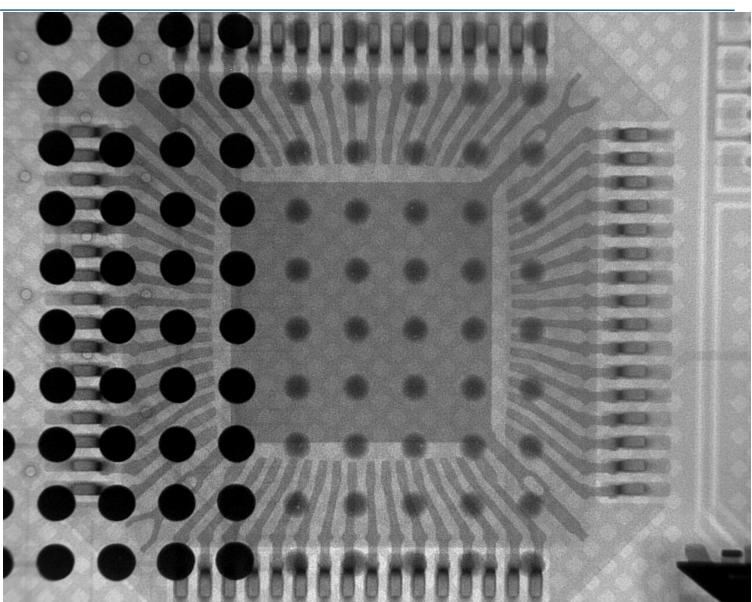






R+R 36 / Z - X-Ray nach Rework 1 - S-PQFP-G64



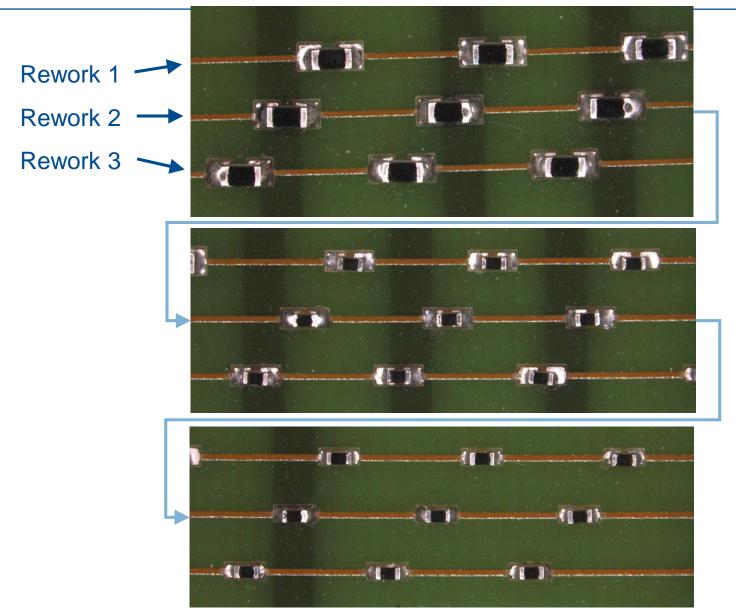






TAC

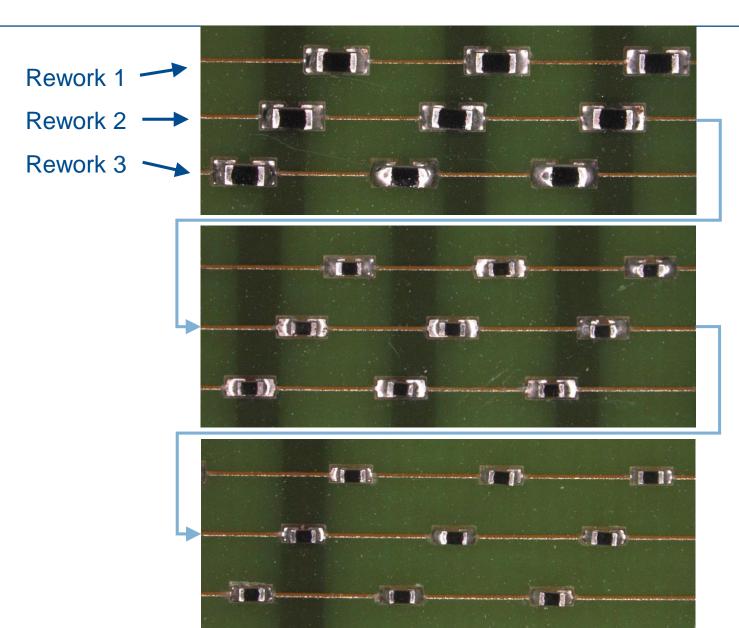






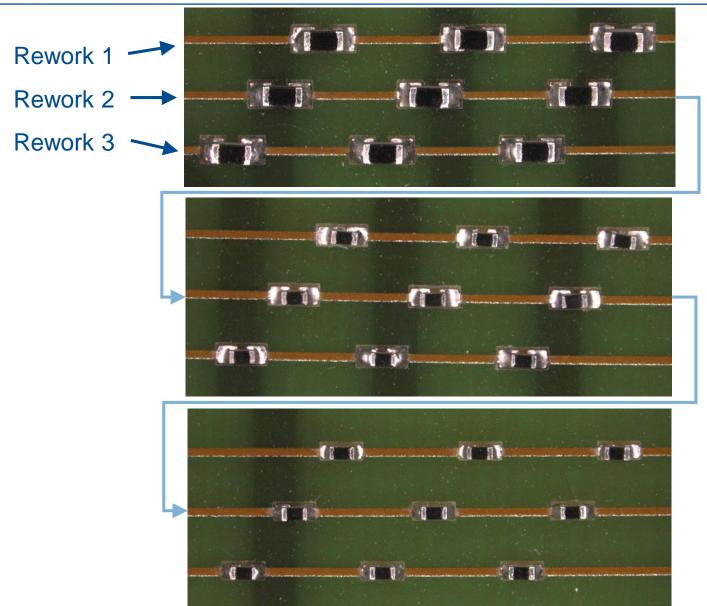






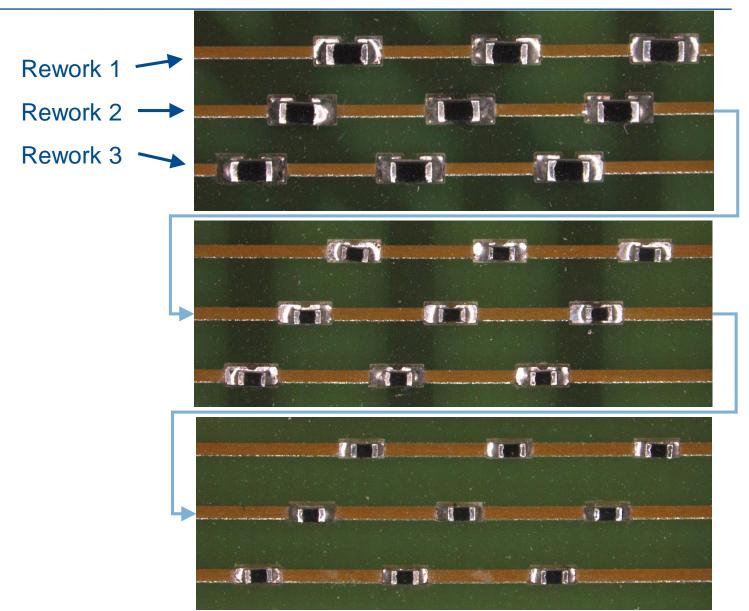




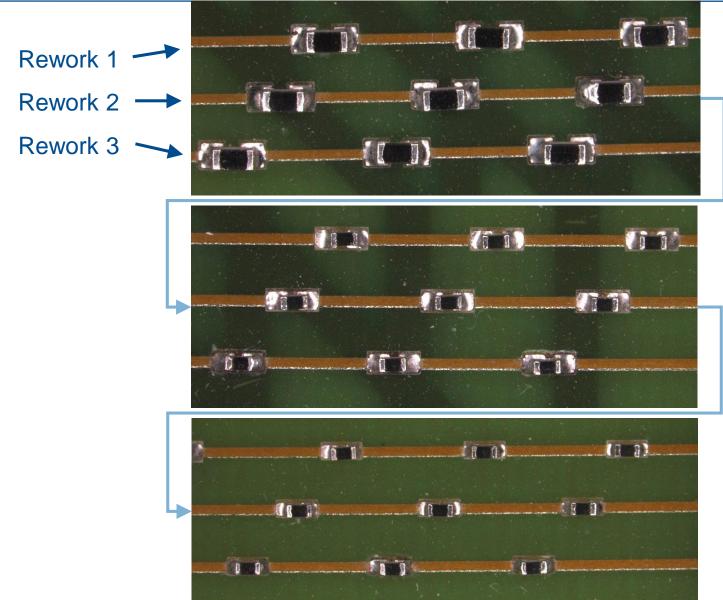










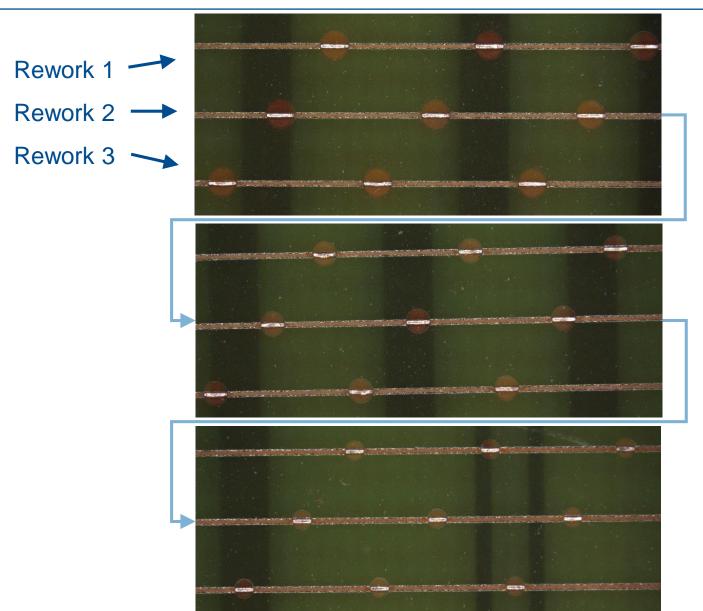




Bead Probes

R+R 34 / Z – Optisch nach Rework 1/2/3 – Bead Probes 0,1

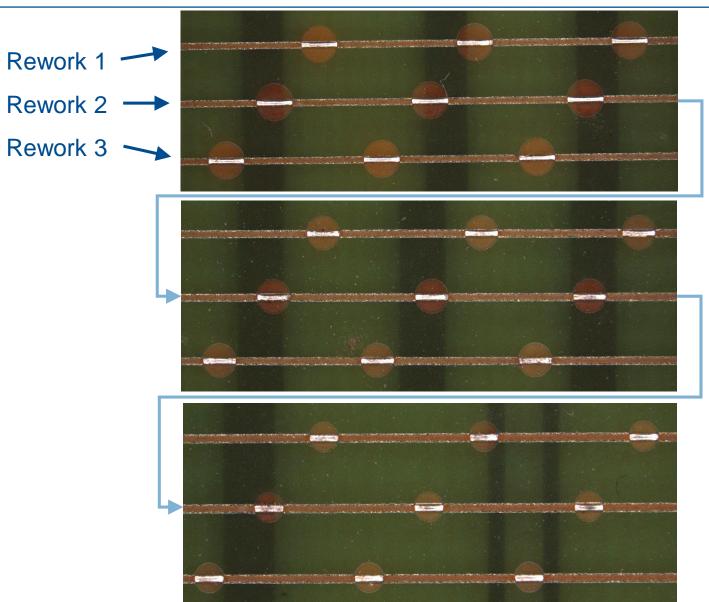






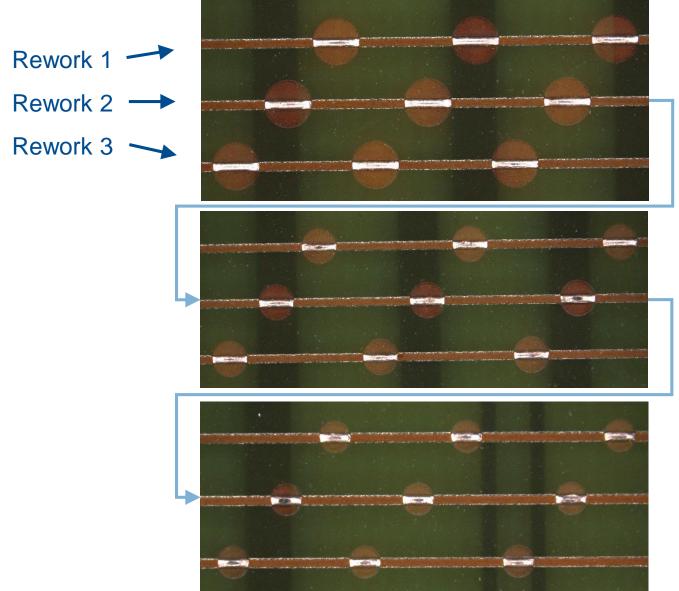
R+R 34 / Z – Optisch nach Rework 1/2/3 – Bead Probes 0,15 **ZVE!**





R+R 34 / Z – Optisch nach Rework 1/2/3 – Bead Probes 0,2

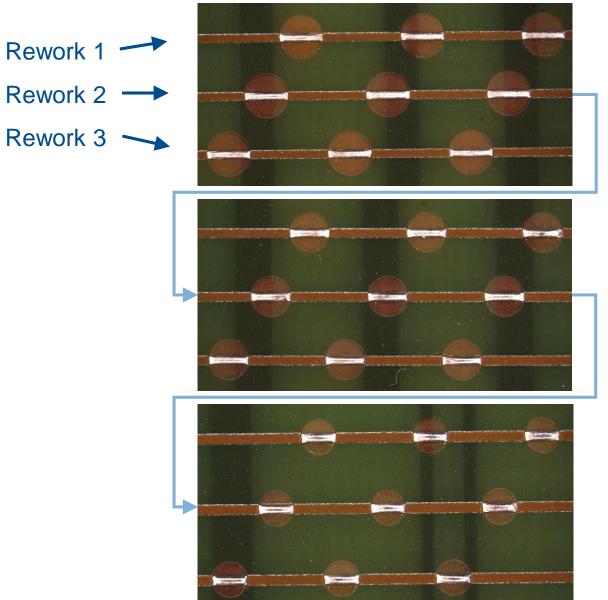






R+R 34 / Z – Optisch nach Rework 1/2/3 – Bead Probes 0,25 **ZVE**:









R+R 34 / Z – Optisch nach Rework 1/2/3 – Bead Probes 0,3



