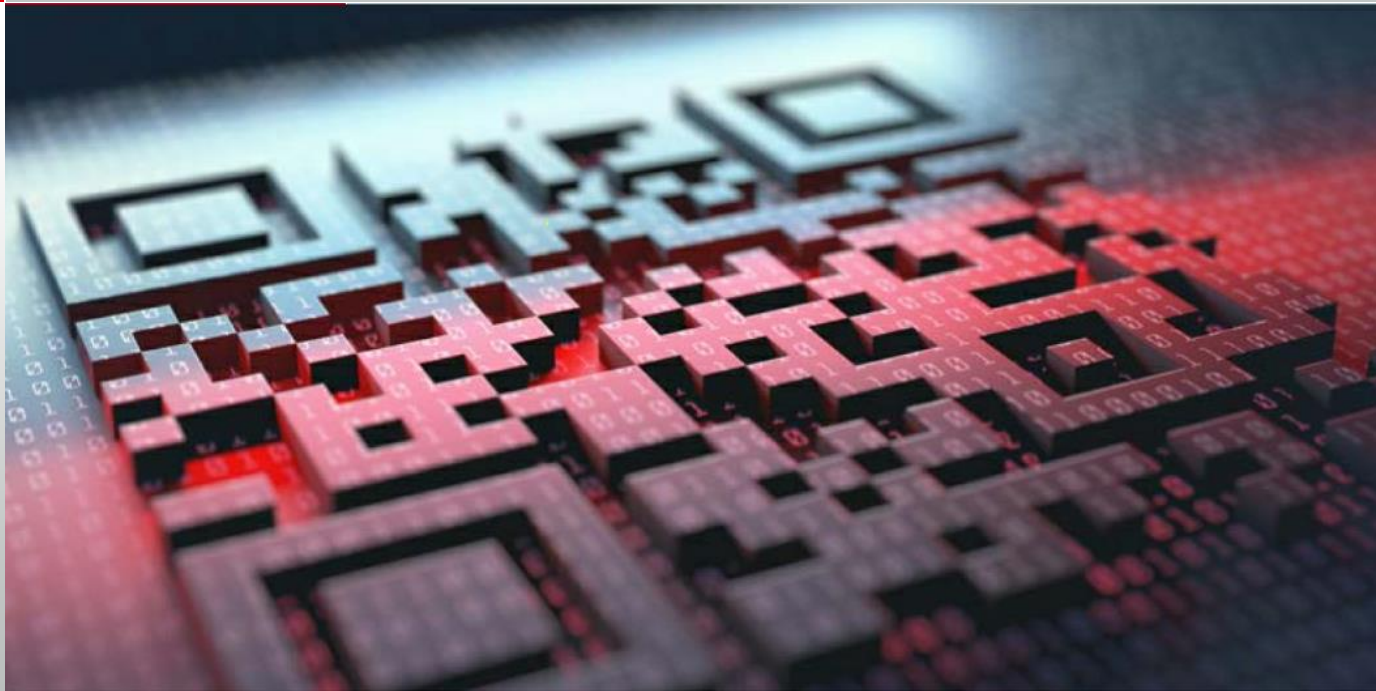


2D CODES – YOUR PCB GETS UNIQUE



Niedernhall

09.02.2022

AGENDA



- 1** Coding options
- 2** Advantages of Data Matrix Codes
- 3** Possible content and needed space
- 4** Best practice / Dos and Don`ts
- 5** Video: printing of a DMC






Christian Löffler
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AGENDA



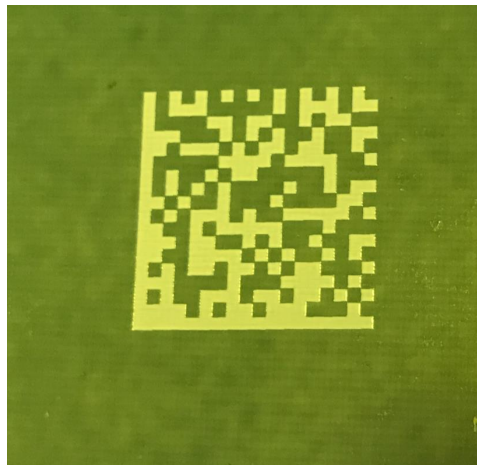
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CODING OPTIONS

Codetypes and content				
Codetype	Text	Barcode	QR	DMC
Standard		ISO / IEC 15420	ISO / IEC 18004	ISO / IEC 16022
Bild	WE_DMC_Webinar2022			
Recommended minimum size	1 mm frontlight		8x8 mm	6x6 mm (square) 4x12 mm (rectangluar)

CODING OPTIONS

- We implement the codes by Inkjet with white colour
- Digital Inkjet printer
- Printing after soldermask



POLL 1



▪ Which codetype has the best space / information ratio?

- A) Text
- B) Barcode
- C) QR
- D) DMC

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ADVANTAGES OF DATA MATRIX CODES

- **Less need of space to store information**
- **More content while less space compared to text**
- **Good readability with integrated error correction**
- **Machine readable**
- **Pass on information to following systems and processes**
- **Reduce errors, no manual input necessary**

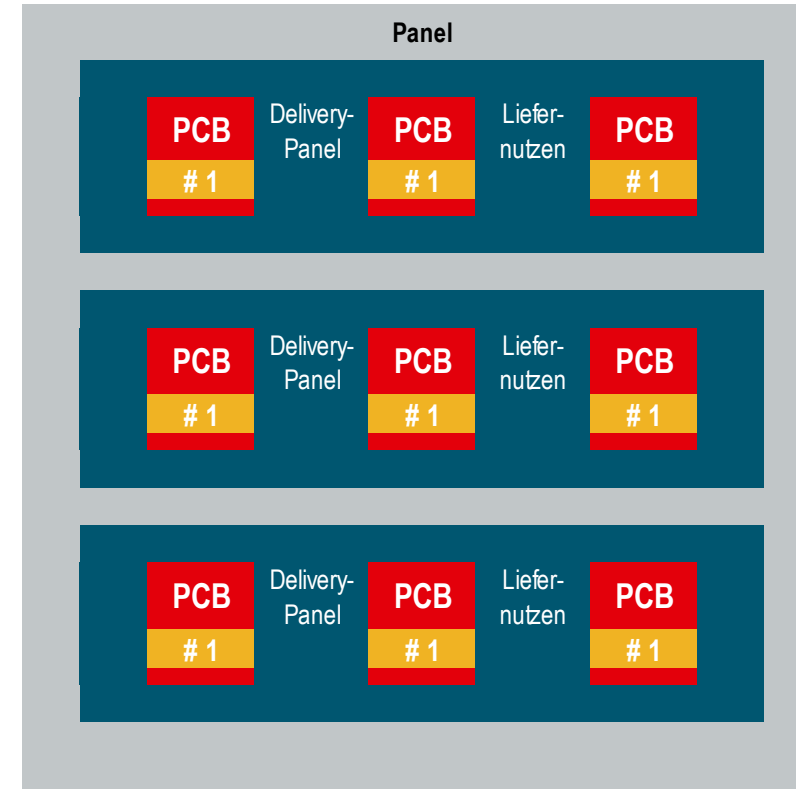
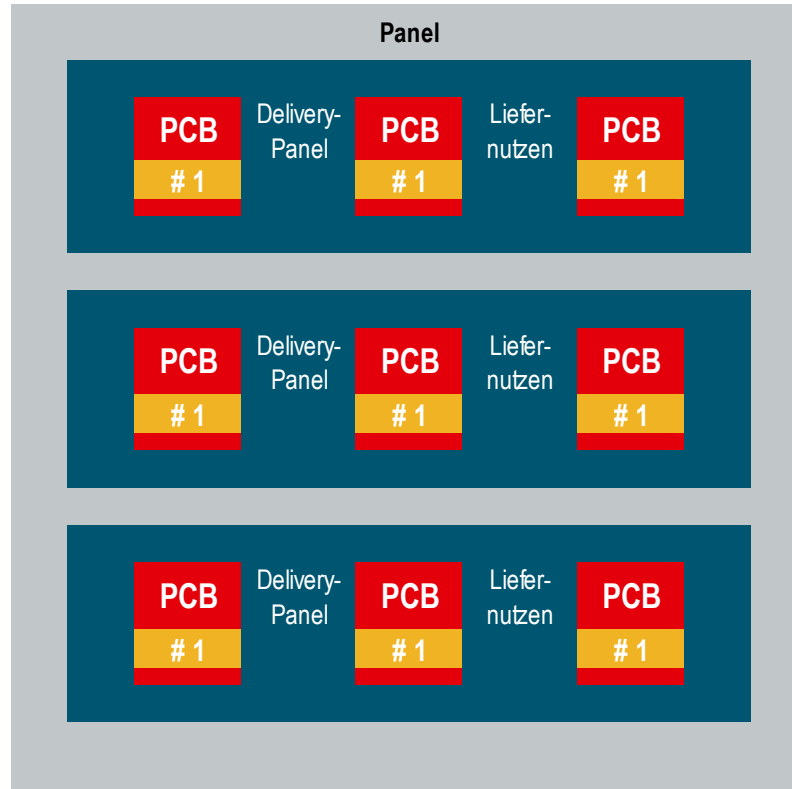


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POSSIBLE CONTENT AND NEEDED SPACE

- Static content



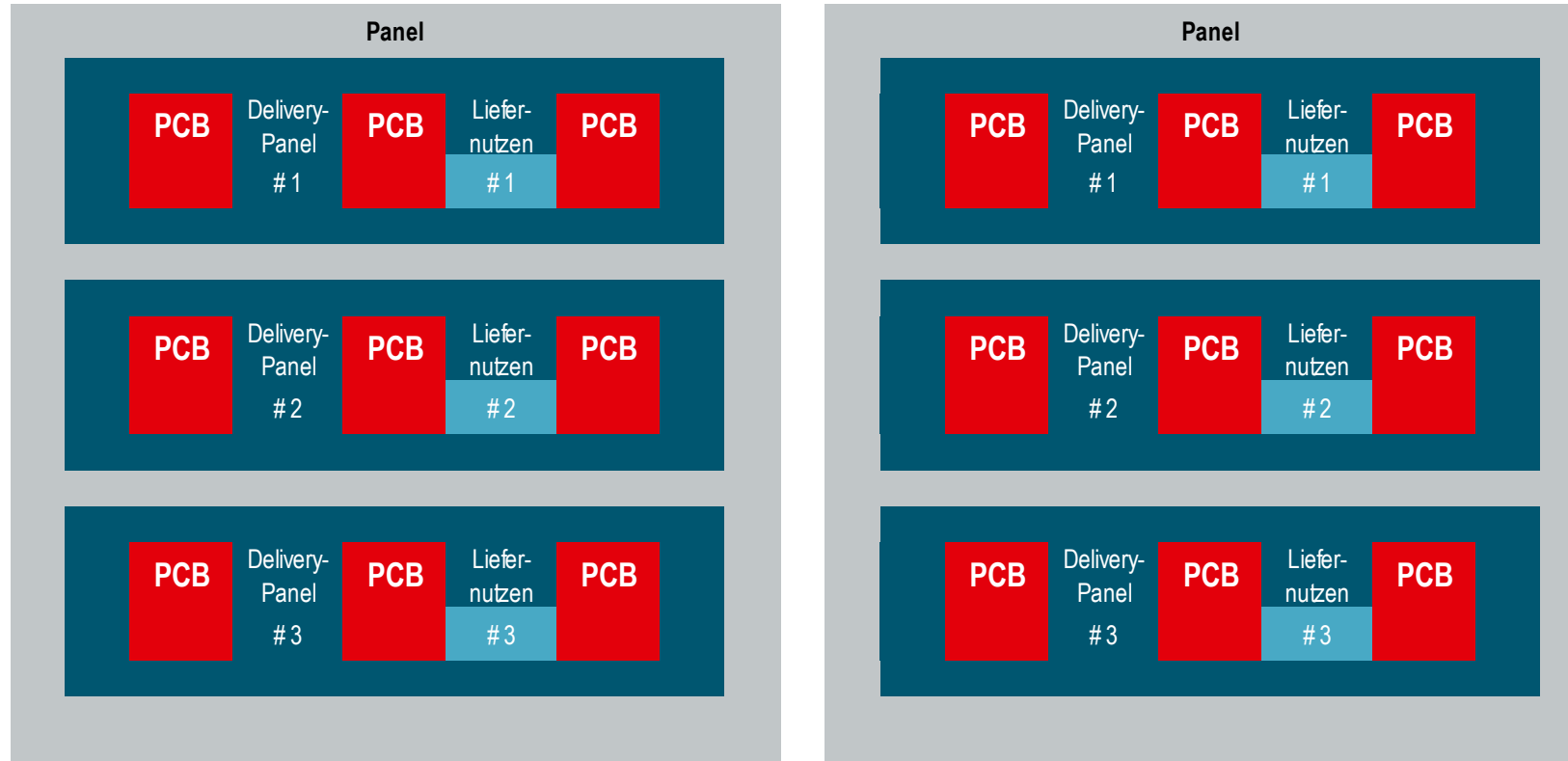
POSSIBLE CONTENT AND NEEDED SPACE

- Numbering of production panel



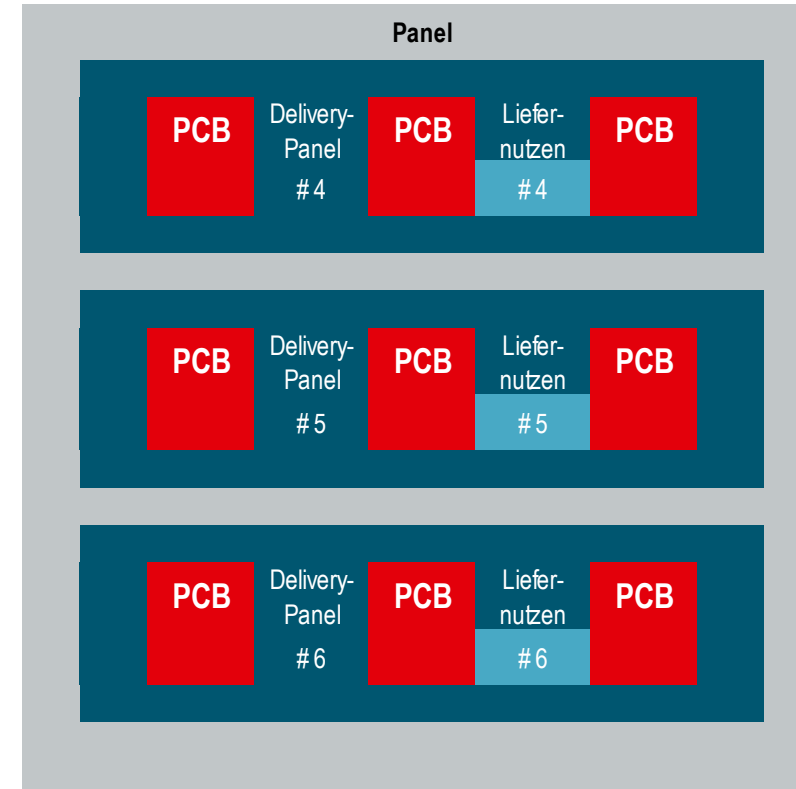
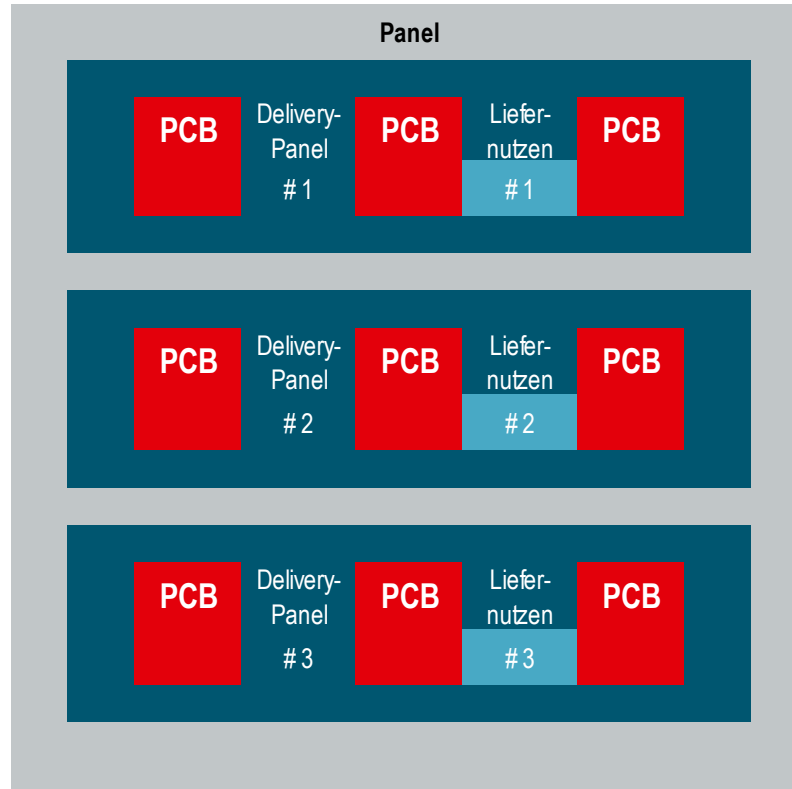
POSSIBLE CONTENT AND NEEDED SPACE

- Numbering of delivery panel in productin panel (Nest number)



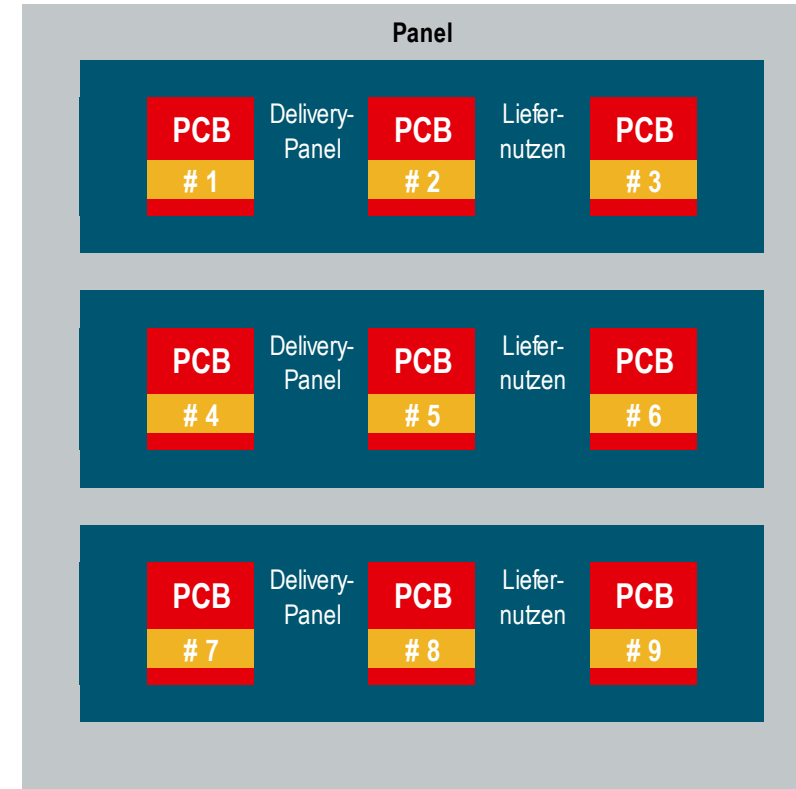
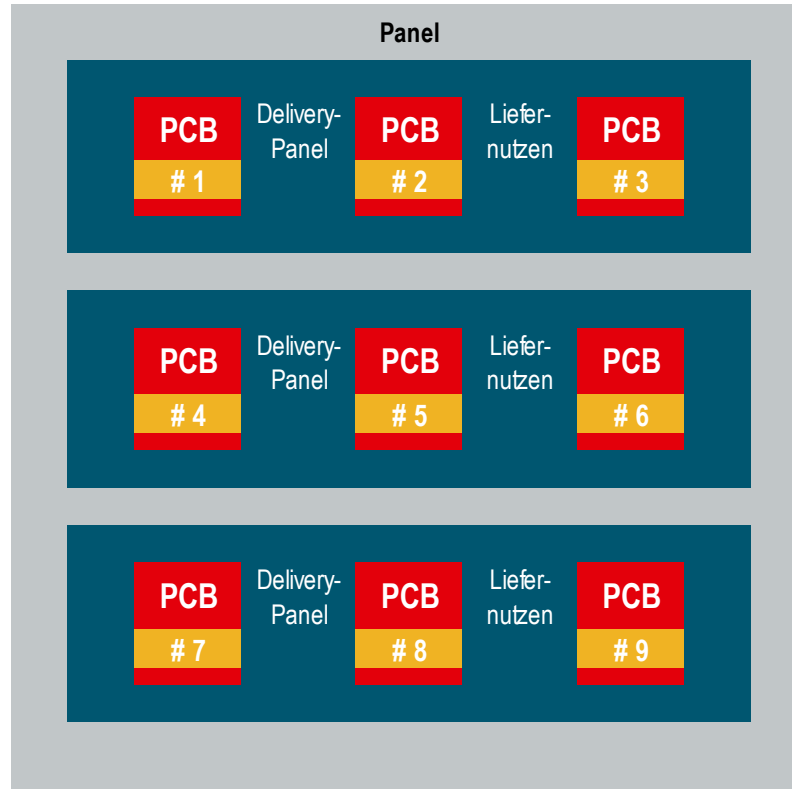
POSSIBLE CONTENT AND NEEDED SPACE

- Serial number for delivery panel



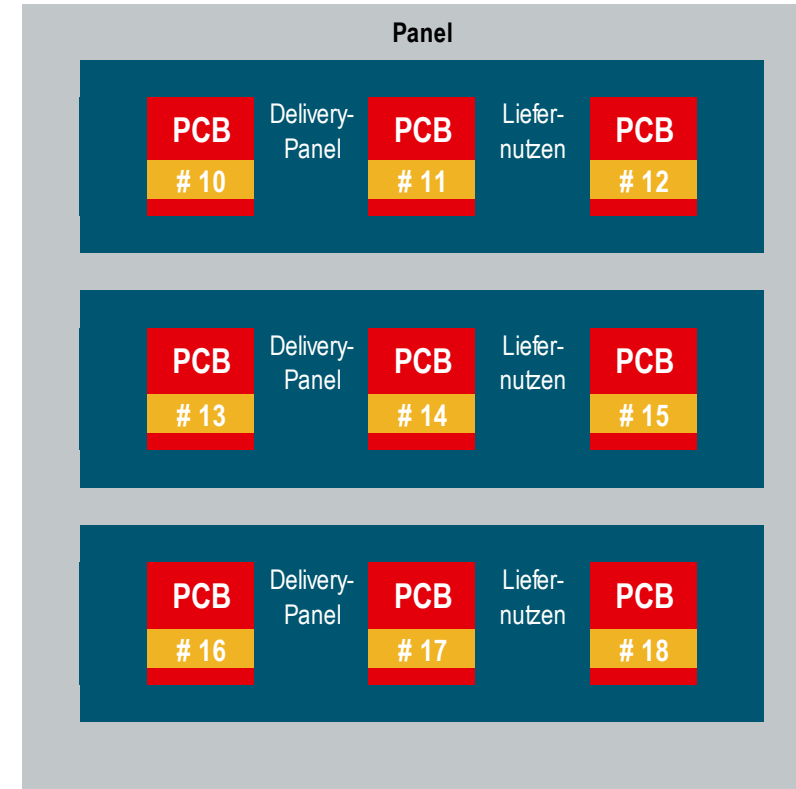
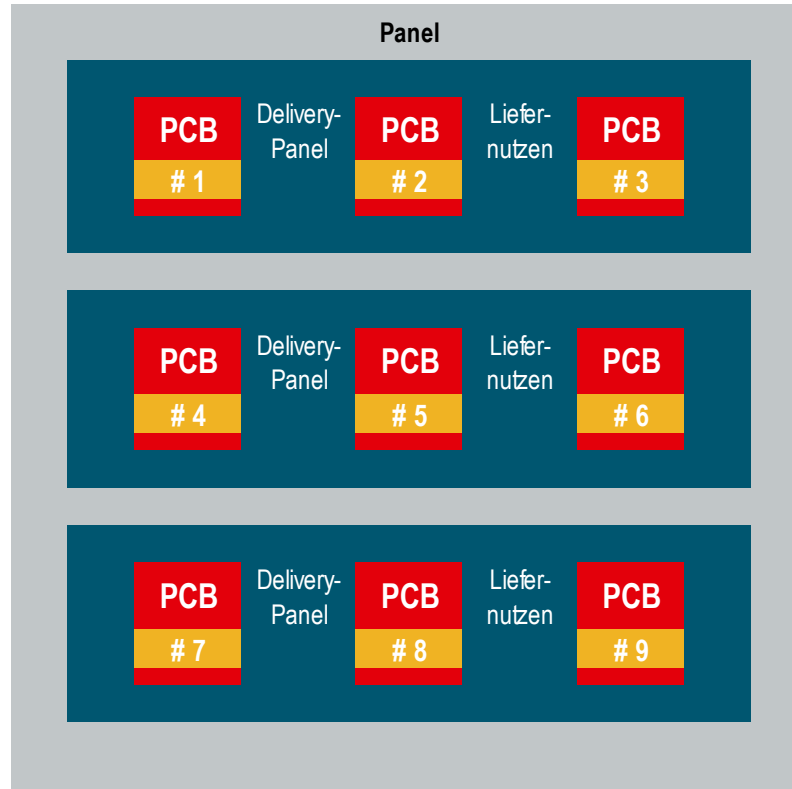
POSSIBLE CONTENT AND NEEDED SPACE

- Numbering single PCB in production panel (Nest number)



POSSIBLE CONTENT AND NEEDED SPACE

- Serial number for single PCB









POSSIBLE CONTENT AND NEEDED SPACE

- Dynamic combination



POSSIBLE CONTENT AND NEEDED SPACE

Matrix size	Amount of data numerical	Amount of data alpha numerical	Number of fields	Size in mm	DMC
10 x 10	6	3	1	3,4 x 3,4	
12 x 12	10	6	1	4,1 x 4,1	
14 x 14	16	10	1	4,8 x 4,8	
16 x 16	24	16	1	5,4 x 5,4	
18 x 18	36	25	1	6,1 x 6,1	
20 x 20	44	31	1	6,8 x 6,8	
...







■ Square DMC

Example:

The customer wants a DMC with the following content: **WE_DMC_Webinar2022**

- Content: 18 alpha numerical characters
- Therefore we need a matrix size 18x18
- The minimum size of the DMC is 6,1x6,1 mm

POSSIBLE CONTENT AND NEEDED SPACE

Matrix size	Amount of data numerical	Amount of data alpha numerical	Number of fields	Size in mm	DMC
8 x 18	10	6	1	2,8 x 6,2	
8 x 32	20	13	2	2,8 x 10,9	
12 x 26	32	22	1	4,1 x 8,9	
12 x 36	44	31	2	4,1 x 12,3	
16 x 36	64	46	2	5,5 x 12,3	
16 x 48	98	72	2	5,5 x 16,4	

■ Rectangular DMC

Example:

The customer wants a DMC with the following content: **WE_DMC_Webinar2022**

- Content: 18 alpha numerical characters
- Therefore we need a matrix size 12x26
- The minimum size of the DMC is 4,1x8,9 mm



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BEST PRACTICE, DOS AND DON'TS NOT THE BEST



Type	Content	Number of characters	Required size
DMC	WE_001/ABCD-EFG++01-01	22	5 x 5mm
Text	WE_001/ABCD	11	1 mm



- Size is too small
- Content of text and code are not the same
- Rotation of text and code are not the same
- Content is not well-arranged

BEST PRACTICE, DOS AND DON'TS BETTER



Type	Content	Number of characters	Required size
DMC	WE_001_ABCD_EFG_01_01	21	7 x 7mm
Text	WE_001_ABCD_EFG_01_01	21	1 mm



- Size is sufficient
- Content of text and code are the same
- Rotation of text and code are the same
- Content is well-arranged

BEST PRACTICE, DOS AND DON'TS SUMMARY



- DMC and text should always have the same content
- DMC and text should always have the same rotation
- Summarize the content to a compact level
- The matrix size has to match the number of characters
- Pick the right minimum size in millimeter
- Front- and backside can not have the same number because a mirroring in the software is not possible



POLL 2



- **Which parts would you say are important for your code?**
 - A) Your own company name
 - B) Serial number PCB wise
 - C) Serial number consistent for all your products
 - D) Further processing of the data for following processes
 - E) Traceability of the position in delivery / production panel

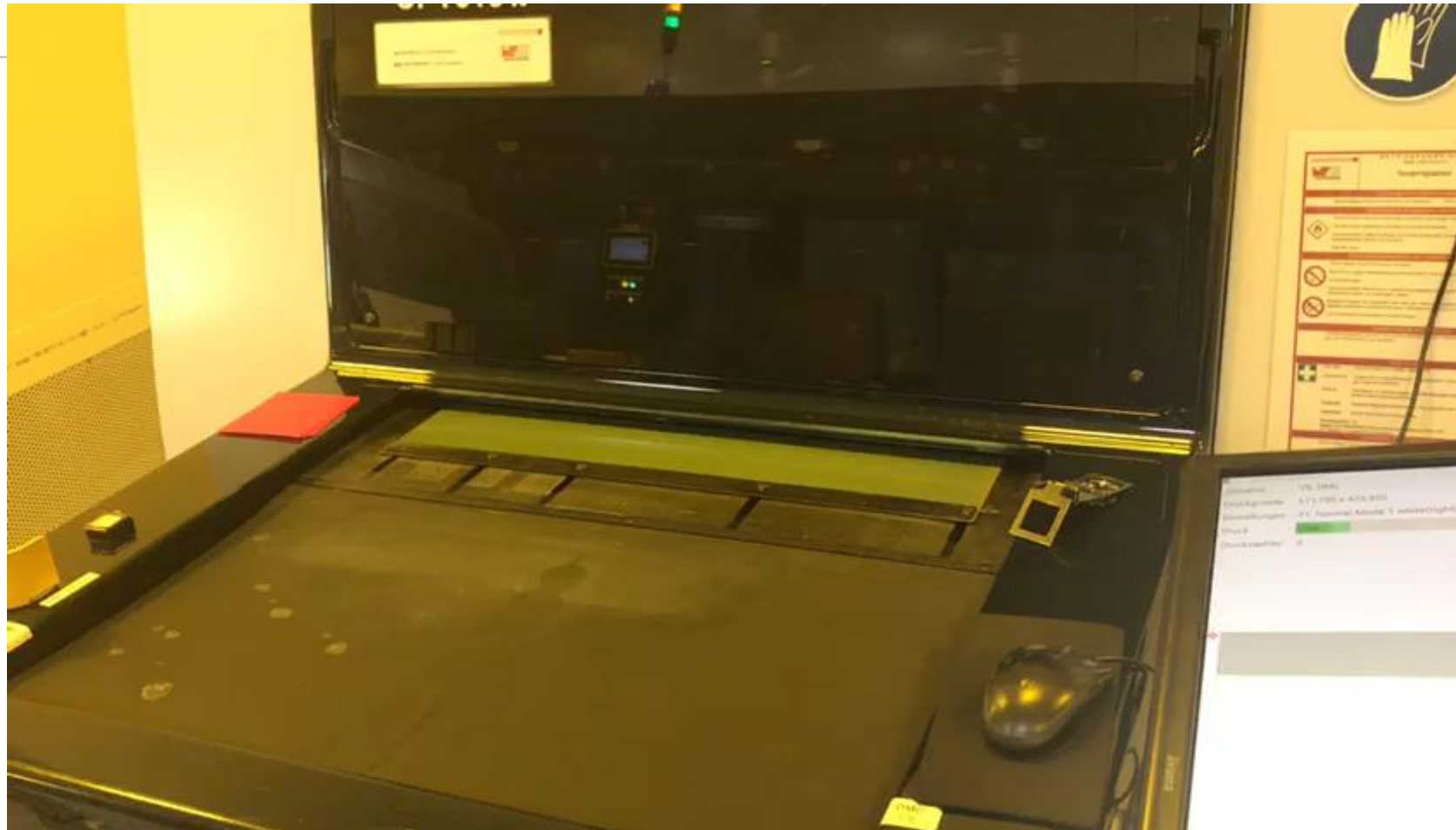


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VIDEO: DRUCKEN EINES DMC



POLL 3



- **Do you use any method to get a traceability for your PCBs? If yes, which one?**
 - A) Yes, Code by printing or by laser
 - B) Yes, Code by sticking labels
 - C) No
 - D) No, but an implementation is planed



CONCLUSION

We are pleased to check your requirements!

<https://www.we-online.com/web/en/leiterplatten/layout/layout.php>

Important information for your request:

- Definition of the content, dynamic or static
- Size, Matrix, Position
- Examples of the numbering



THANK YOU FOR YOUR ATTENTION



**What kind of
application
do you have?**

**HOW can WE
support you?**