

# Jovix Auto-ID Deployment

Version 2024.5.1



## Version history

Version Number	Date	Revised By	Notes
2024.5.1	May 2024	Subbu Nambi	Initial release

# Introduction

Jovix uses barcode labels and RFID tags as auto-id identifiers on the field.

Jovix barcodes are printed on direct thermal Zebra® ThermaLock® 4100D labels using a Zebra® mobile printer and can either be attached directly to material with the adhesive backing or attached to other substrates like manila tags if it's not feasible to attach directly.

Jovix RFID tags are durable pre-printed RFID labels with multiple barcode identifiers and attachment mechanisms. The passive tags can be attached directly to material using the adhesive backing, screws/staples or outdoor durable UV resistant cable ties.

This informational presentation details suggested attachments mechanisms along with detailed examples from production deployments in different scenarios and diverse material types.

# Auto-ID tagging strategy

## Sample plan for tagging different material profiles

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	MATERIAL DESCRIPTION	Receive Location	Storage type	Volume	Replacement Risk	Material Control Risk	Critical Path	Sum of Risks	Type I Tag	Type I Tag Application	Location of tag	Quantity of Material	Tag Removal Location	Tag Removal Responsibility
1														
2	<b>High Level Tagging Assessment</b>													
3	Rebar	1	1	1	1	1	3	8	Barcode	Project	Crate & EA	8,000	N/A	N/A
4	Rebar	3	3	3	3	1	1	12	Barcode	Project	Bundle	1,500	N/A	N/A
5	Piping Bulks	1	3	3	1	1	1	10	Barcode	Project	Container or EA	10,000	N/A	N/A
6	Electrical Bulks	1	1	3	1	1	1	8	Barcode	Project	Container or EA	10,000	N/A	N/A
7	Pre-Fabricated Pipe Spools (Chrome & Large Bore)	3	3	3	5	3	5	22	RFID Tag	Fabricator	Pipe End / EA	2,500	Installation	Construction
8	Pre-Fabricated Pipe Spools (Chrome Small Bore)	3	3	3	5	3	5	22	RFID Tag	Fabricator	Pipe End / EA	2,500	Installation	Construction
9	Pre-Fabricated Pipe Spools (Remaining)	3	3	3	3	3	3	18	Barcode	Fabricator	Pipe End / EA	2,500	Installation	Construction
10	Pre-Fabricated Structural Steel	3	3	1	3	3	3	17	Barcode	Fabricator	Member End /EA	2,500	Installation	Construction
11	Valves	1	1	3	5	5	3	18	Barcode	Supplier	Crate or EA	6,500	Installation	Construction
12	Tagged Specialty Items (Strainers/Traps/Etc...)	1	1	3	5	5	3	18	Barcode	Supplier	EA	800	Installation	Construction
13	Tagged Instruments	1	1	5	5	5	3	20	RFID Tag	Supplier	EA	4,600	Installation	Construction
14	Power Island Equipment (Owner Procured)	3	3	3	5	5	5	24	RFID Tag	Project	Crate & EA	2,400	Installation	Construction
15	Mechanical Equipment (Project Procured)	3	3	3	3	3	1	16	Barcode	Supplier	Crate & EA	2,400	Installation	Construction
16	Electrical Equipment	1	1	3	3	3	3	12	Barcode	Supplier	Container or EA	5,000	Installation	Construction
17	Tagged Pipe Supports	3	3	3	5	3	3	20	RFID Tag	Supplier	Crate & EA	450	Installation	Construction
18	Cable	3	3	3	1	3	1	14	Barcode	Supplier	Reel	300	Installation	Construction
19	Concrete Form Work	3	3	1	1	3	1	12	Barcode	Project	EA	200	Installation	Construction
20								0	Barcode					
21								0	Barcode					
22								0	Barcode					
23								0	Barcode					
24								0	Barcode					
25								0	Barcode					
26								0	Barcode					
27								0	Barcode					
28								0	Barcode					
29														
30														
31														
32														

RFID Contingency (20%)	2,490
Total Passive RFID Tags	14,940
Total Barcodes	49,700

# Barcode labels

## Label specifications

- ThermaLock labels can be applied at >25°F (-4°C)
- Service temperature is rated at -65°F to 248°F (-54°C to 120°C)
- Outdoor durability is rated for 12 months with longer durability in indoor and shaded environments
- The label can handle extreme cold, direct sunlight, rain, snow and exposure to a wide range of chemicals



## Label application notes

- Surface should be clean and dry, and free of dirt and debris during application
- Dwell time of 24 hrs. is required for the curing of the acrylic adhesive
- **Note:** As is common with any direct thermal label, the ink is embedded below the top layer of the labels which gets activated on heat by the printer head.

So these labels **will smudge** if there is direct pressure from **edge or point loads** applied on the face of the label, so care needs to be taken to ensure minimal direct abrasion on top of the label after application. There should be no smudging during the regular application of the label by hand.

# Barcode label application examples

Direct application to materials including wood containers, corrugated boxes and bulk items



# Barcode label application examples

Application on instrumentation, valves and other equipment in warehouse storage

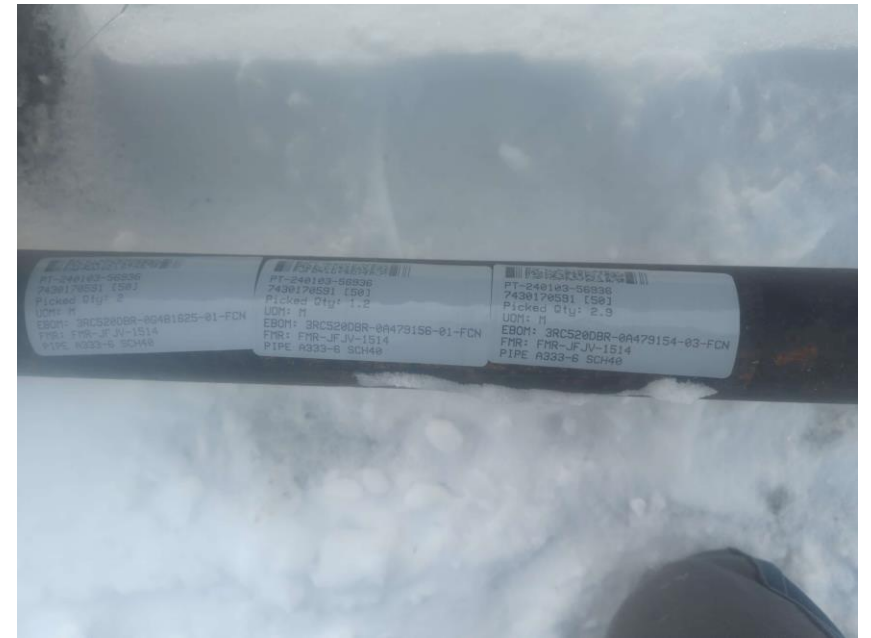
- If there are restrictions on application of the label directly to some materials, the labels can be affixed to manila type labels with grommets with metal ties as shown below in the first two images
- Labels are also generally used for Jovix Named Locations for assigning Materials to virtual bins in the warehouse



# Barcode label application examples

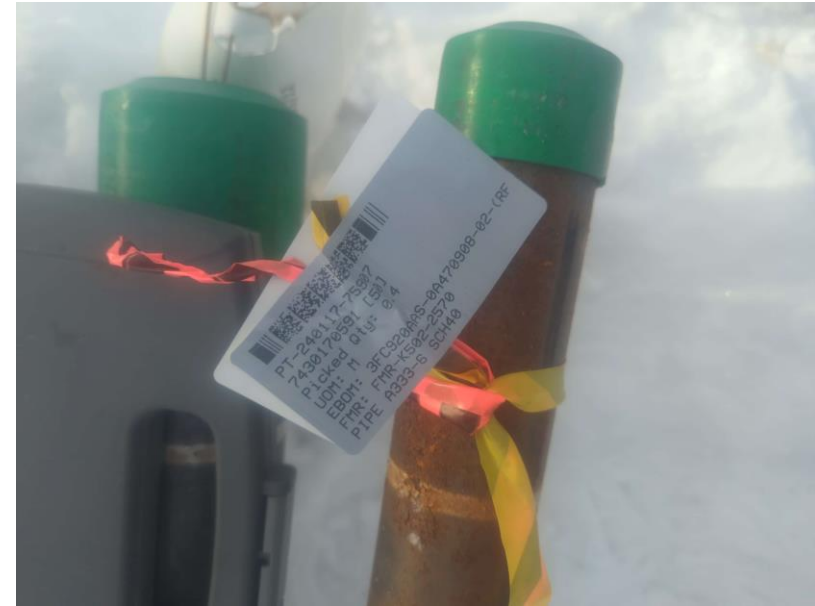
## Outdoor applications on materials including steel and spools

- If there are restrictions on application of the label directly to some materials, the labels are attached to other substrates and pipe caps in some examples shown below



# Barcode label application examples

Additional examples of outdoor applications on materials including steel and spools in adverse environments



# Barcode label application examples

Additional examples of outdoor applications on materials including steel and spools



# Passive RFID labels

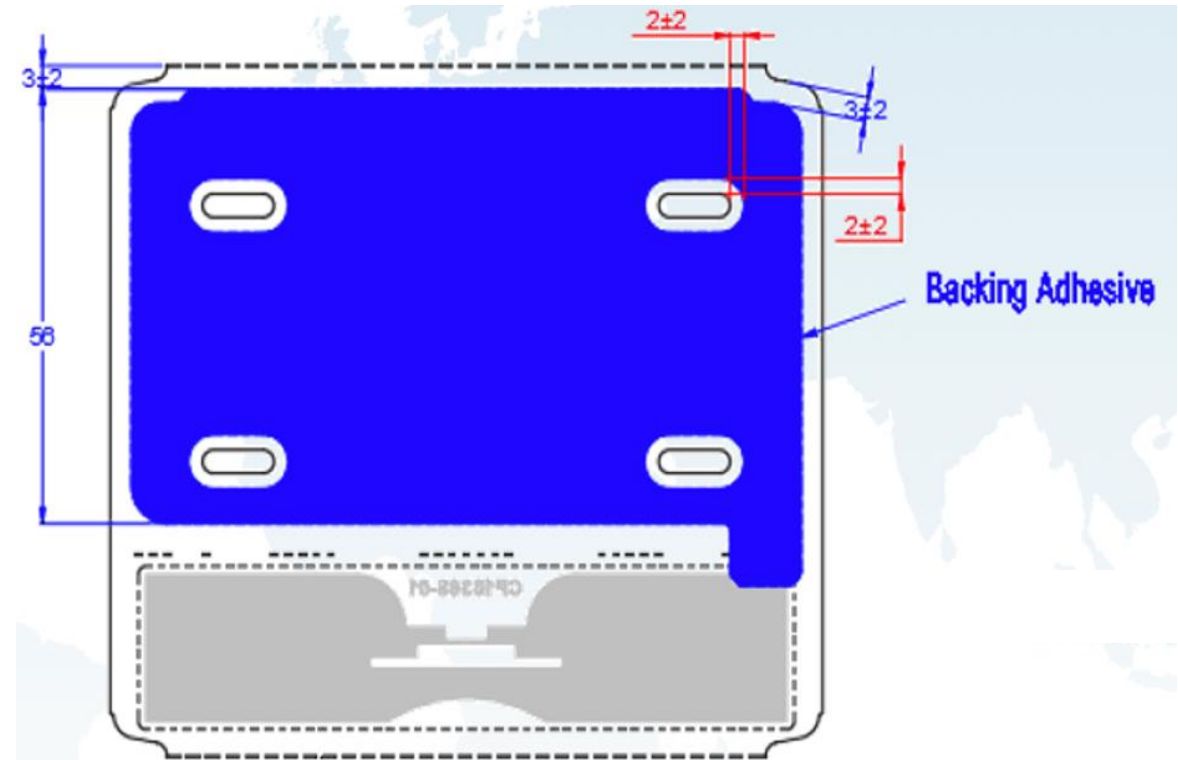
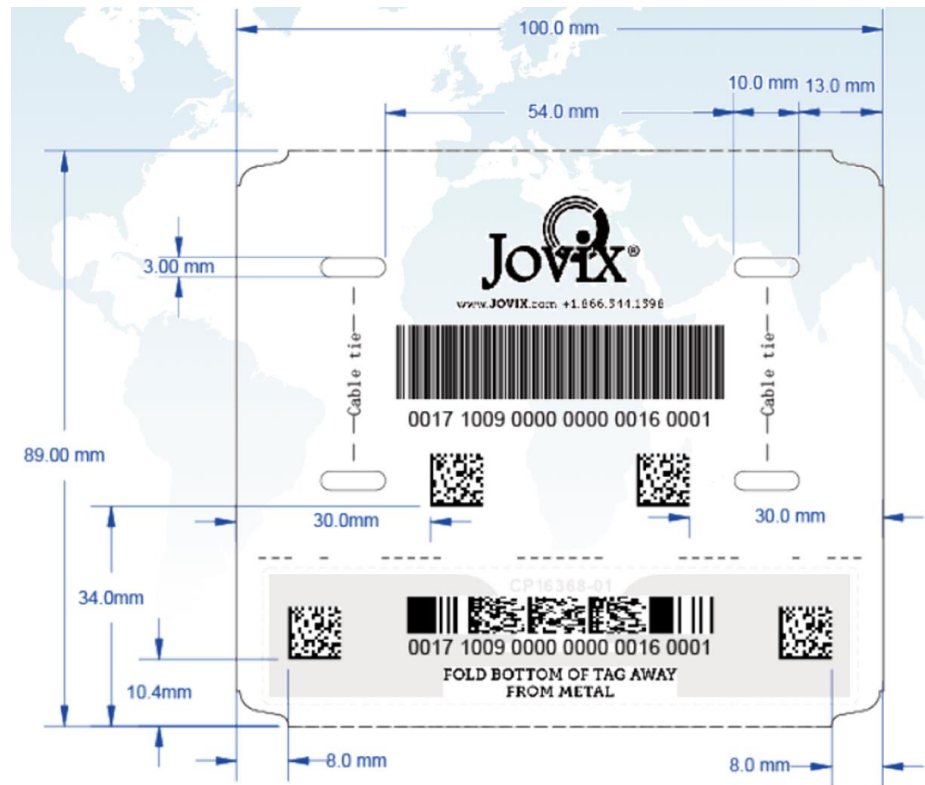
## Label specifications

- Passive RFID tags have a service temperature of -40°F to 185°F (-40°C to 85°C)
- Tags are IP68 and MIL-STD-810G rated
- Read range of 7.5 meters (handhelds) to 14 meters (fixed readers)
- Hazardous location marked tags are also available as an option (ATEX Zone 2/Class I Div 2)
- Updated tags include tie slot widths of 10mm/1cm/0.39" to support a wide range of zip tie lengths
- Tags are also available with adhesive backing which can be peeled and stuck directly on materials
- **Please note that some of the tags in production environments shown in the images in subsequent slides have the narrower tie slots and based on client feedback are now shipped with wider slots as shown in the images on the right**



# Passive RFID labels

Label specifications showing dimensions and peel off adhesive backing



# Passive RFID zip tie specifications

## Zip tie specifications

- Uline BL\_3209 black zip ties are recommended as they are UV resistant and rated for -40°F to 180°F (-40°C to 82°C)
- The tie slots on the passive tag will support a tie width of 0.39", so a wide range of tie lengths can be used to support different material profiles
- [UV Resistant Cable Ties, Black UV Zip Ties – ULINE](#)



BLACK UV CABLE TIES \* UL Listed

MODEL NO.	LENGTH	WIDTH	TENSILE STRENGTH	QTY./PACK	PRICE PER PACK				ADD TO CART
					1	5	10	20+	
S-5826*	4"	.10"	18 lbs.	1,000	\$22	\$21	\$20	\$19	<input type="checkbox"/> ADD
S-5827*	5 1/2"			1,000	24	23	22	21	<input type="checkbox"/> ADD
S-14034*	6"			1,000	26	25	24	23	<input type="checkbox"/> ADD
S-14035*	7"			1,000	30	28	26	25	<input type="checkbox"/> ADD
S-12394*	8"			1,000	32	31	30	28	<input type="checkbox"/> ADD
S-5828*	5 1/2"	.14"	40 lbs.	1,000	30	28	26	25	<input type="checkbox"/> ADD
S-5829*	6"			1,000	32	31	30	28	<input type="checkbox"/> ADD
S-5830*	7"			1,000	36	35	34	33	<input type="checkbox"/> ADD
S-5831*	8"			1,000	\$36 per pack any quantity				<input type="checkbox"/> ADD
S-14036*	9"			500	28	26	25	24	<input type="checkbox"/> ADD
S-12395*	10"			500	30	28	26	25	<input type="checkbox"/> ADD
S-12396*	11"			500	33	32	31	30	<input type="checkbox"/> ADD
S-22719*	12"			500	34	33	32	31	<input type="checkbox"/> ADD
S-14037*	13"			500	36	35	34	33	<input type="checkbox"/> ADD
S-12398*	15"			500	42	41	40	39	<input type="checkbox"/> ADD
S-14932*	7"			1,000	52	50	46	44	<input type="checkbox"/> ADD
S-11131*	8"			1,000	59	57	55	53	<input type="checkbox"/> ADD
S-14038*	10"			1,000	64	62	60	57	<input type="checkbox"/> ADD
S-5832*	11"			1,000	73	70	66	63	<input type="checkbox"/> ADD
S-12399*	12"			1,000	89	85	80	76	<input type="checkbox"/> ADD
S-5833*	14"	1,000	106	100	95	90	<input type="checkbox"/> ADD		
S-5834*	16"	500	64	62	60	58	<input type="checkbox"/> ADD		
S-12400*	18"	500	65	63	61	59	<input type="checkbox"/> ADD		
S-12401*	21"	500	77	74	71	68	<input type="checkbox"/> ADD		
S-14933	8"	.25"	80 lbs.	100	18	17	15	14	<input type="checkbox"/> ADD
S-14934	14"			100	21	20	19	18	<input type="checkbox"/> ADD
S-14935	24"			100	36	35	34	33	<input type="checkbox"/> ADD
S-14936*	8"			100	20	19	18	17	<input type="checkbox"/> ADD
S-14039*	11"			100	21	20	19	18	<input type="checkbox"/> ADD
S-5835*	14"			100	22	21	20	19	<input type="checkbox"/> ADD
S-22720*	18"	100	31	29	26	24	<input type="checkbox"/> ADD		
S-14040*	21"	100	45	43	41	39	<input type="checkbox"/> ADD		
S-12397	24"	100	54	52	50	46	<input type="checkbox"/> ADD		

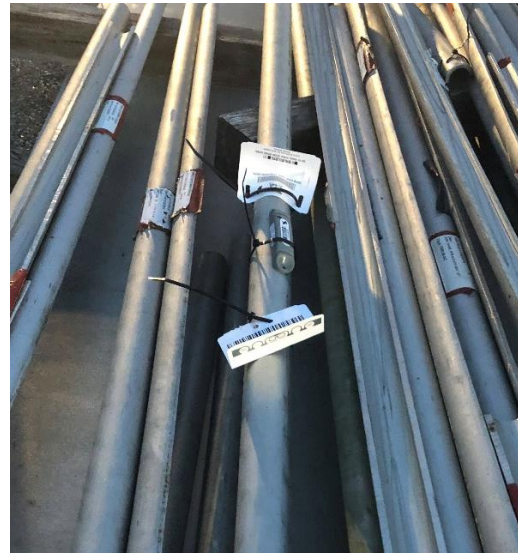
JUMBO BLACK UV CABLE TIES \* UL Listed  
EXTRA HEAVY DUTY

MODEL NO.	LENGTH	WIDTH	TENSILE STRENGTH	QTY./PACK	PRICE PER PACK				ADD TO CART		
					1	5	10	20+			
S-7743*	18"	.35"	175 lbs.	100	\$43	\$41	\$39	\$37	<input type="checkbox"/> ADD		
S-12406*	21"			100	68	62	57	54	<input type="checkbox"/> ADD		
S-11132	24"			100	76	71	64	59	<input type="checkbox"/> ADD		
S-13429	30"			100	82	77	72	64	<input type="checkbox"/> ADD		
S-7744*	36"			100	91	85	79	73	<input type="checkbox"/> ADD		
S-11133	40"			100	98	93	86	79	<input type="checkbox"/> ADD		
S-12409*	48"			50	76	71	64	60	<input type="checkbox"/> ADD		
S-12407	18"			.50"	250 lbs.	100	62	58	54	50	<input type="checkbox"/> ADD
S-12408	36"					100	99	93	85	80	<input type="checkbox"/> ADD

# Passive RFID attachment notes

## Steps to ensure optimal readability

- Tags should never be placed flat on steel. Ensure that the flap at the bottom is folded up so that the tag is separated from metal – this will greatly enhance readability through all mechanisms (handheld reader and IoT readers – gate, vehicle and drone mounted)
- Tag placement should always strive for line of sight from the RFID reader, on top of material
- When laying down materials, care should be taken to not damage the tag or trap it between ground and material
- **Note: If tags are going to be attached to open flat-bed trailers and driven to site, multiple attachment methods may need to be followed to ensure survivability, but this transportation process will permanently impact the read range of tags**



# General best Practices for different material profiles

## Structural Steel

- RFID tags are best placed near the ends of the structural steel components.
- Use bolt holes at steel member ends to ensure tags remain in place, near the ends of the steel members.
- Place tag between 3" – 6" from plate edge to ensure tags are readable and to avoid damage from objects that may be on the ground or near the plate component

## Rebar

- Place the tag on the outer portion of the bundled rebar
- Avoid surfaces that are commonly stacked, use outer edge surface to attach tags

## Instrumentation

- Place the tag on a non-operational area, such as the body, so as not to damage any critical parts during tag attachment/removal

## Cable Reels

- Staple/adhere non-RFID portion of tag to side of cable reel
- Place tag between 6" – 12" from reel edge to ensure tags are readable and to avoid damage from objects that may be on the ground or near the cable reel

# Passive RFID attachment examples

Outdoor attached tags in snow and ice



# Passive RFID attachment examples

Tags attached to cable reels using staples



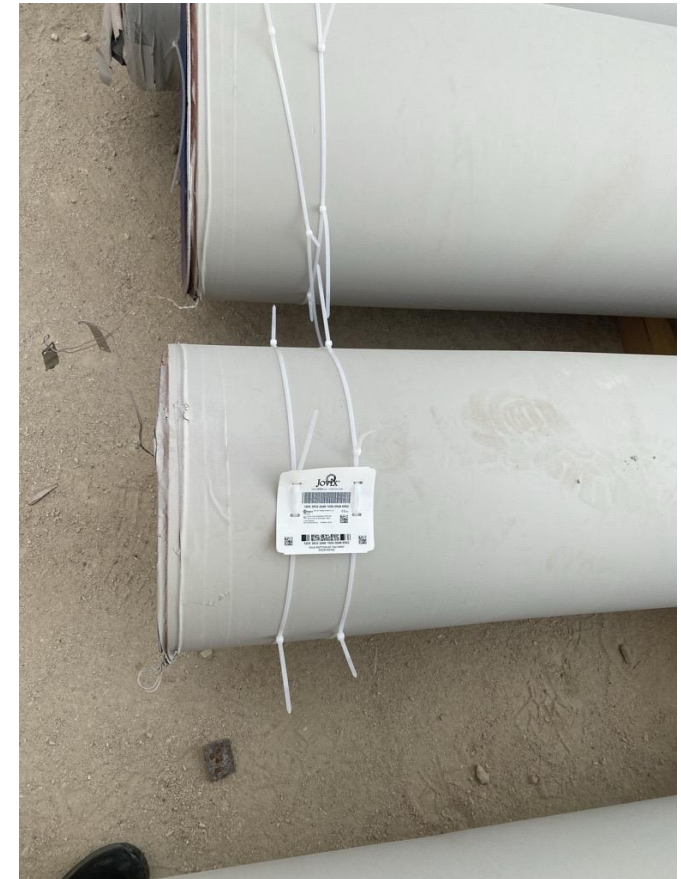
# Passive RFID attachment examples

Attachment to rebar using zip ties



# Passive RFID attachment examples

Attachment to equipment and large bore pipe



# Passive RFID attachment examples

Direct attachment to materials using adhesive backing



# Passive RFID attachment examples

Direct attachment to materials using adhesive backing



# Passive RFID attachment examples

Attachment with adhesive backing to C beams and bulk steel members



# Passive RFID attachment examples

Attachment to pipe spools



# Best Practices for attachment

## Structural Steel

- Attach to ends of structural steel components
- Use bolt holes at steel member ends to secure tags
- Tags attached to material on open bed trailers may need multiple tag attachment mechanisms



# Best Practices for attachment

## Crated materials

- Apply tag in areas that are not likely to be damaged during transport (avoid red area)
- Apply tag in the upper half of the crates outer surface (avoid yellow area)



# Best Practices for attachment

## Dos and Don'ts

