



50

LEAN VISUALS

For Improving Productivity and
Safety in Your Lean Facility

The Pocketbook of Lean Visuals

If you're reading this, you're probably looking for new ways to make your facility more visual. And you're smart for doing so! Companies that incorporate lean visuals throughout their facility are proven to have higher productivity, reduced waste, and improved safety.

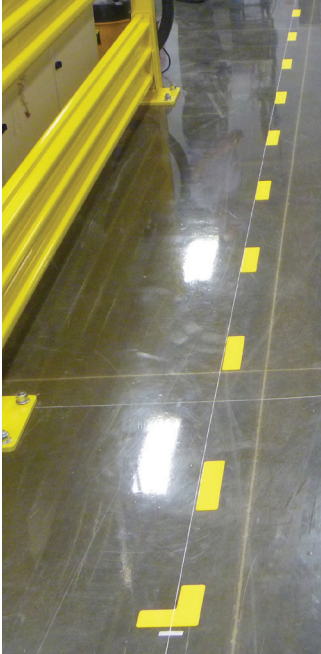
Visuals are also essential to sustaining the success of your lean manufacturing initiatives. They reinforce the standards you put in place, and help your staff and employees detect abnormalities at a glance.

In this Pocketbook...

We'll show you 50 tried-and-true ways to effectively use visuals throughout your facility. Use these examples to get started creating your own visuals – and take the first steps to transforming your facility into a visual workplace!



Workplace Organization Visuals (5S)



1. Vehicle traffic lanes and pedestrian walkways

In a busy plant, controlling the flow of people and vehicles is an important safety concern.

Marking your permanent aisles and passageways is not just a good practice - it is an OSHA requirement (see OSHA CFR 1910.22).



2. Traffic intersections

In addition to marking lanes, use precautionary signals or floor signs at intersections where people and vehicle traffic unavoidably meet.



What's missing?



Now it's clear!

3. Storage locations (use border lines & labels)

Border lines (e.g. striping or border marking tapes) delineate the space allocated and make it easy to identify when something is missing. But by themselves, they can't ensure that the correct items will be returned to their proper place. That's why you also need labels: a label for the border area and one for the object itself (see #4).



But which cart?



That's the one.



Order restored!

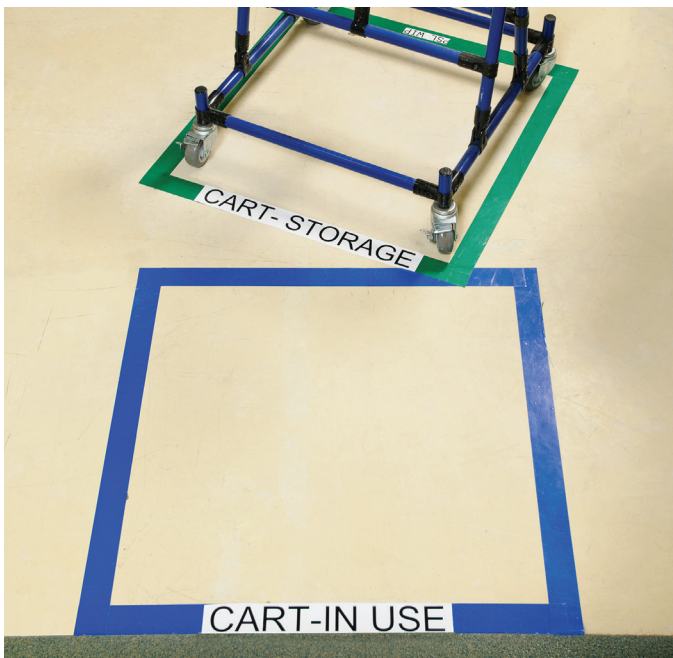
4. Label items as well as borders

Any items stored should also have a label on the item itself that provides information about its storage location. This label can be cross-referenced with the label on the storage location border, as mentioned in #3.



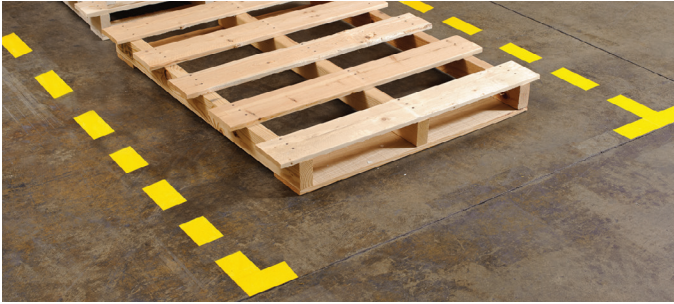
5. “Keep clear” areas

Brady recommends using striped tape to mark areas that need to be kept clear. The stripes demand attention and help enforce compliance. Diagonal lines inside the border can also be included for additional visual impact.



6. “In use” and “out of use” storage locations

Do you have an item that is stored in one place while it's being used, and another when it's not in use? Differentiate the two using different tape or label colours.



7. High traffic storage areas

Floor areas that experience heavy traffic (e.g. dragging skids or pallets) should be marked with corner marks and dashed lines instead of traditional floor tape:

- Less chance that a corner mark or dash will be hit
- Easier to replace one corner or dash than to replace the whole line!



8. Stocking fixtures

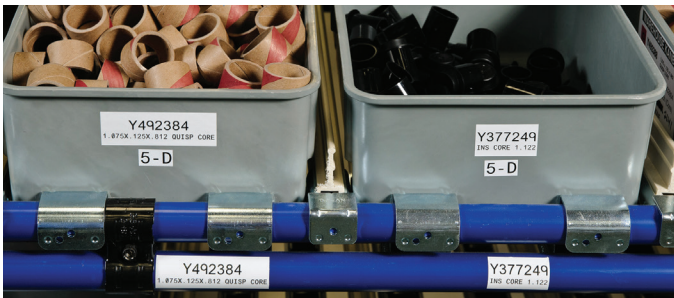
Mark your shelves, flow racks, totes, and other stocking fixtures with industrial labels that are large enough to read at a glance. To help employees locate items faster and reduce mistakes, make sure your visuals include:

- A brief description
- The part number or bar code
- Symbols & pictograms



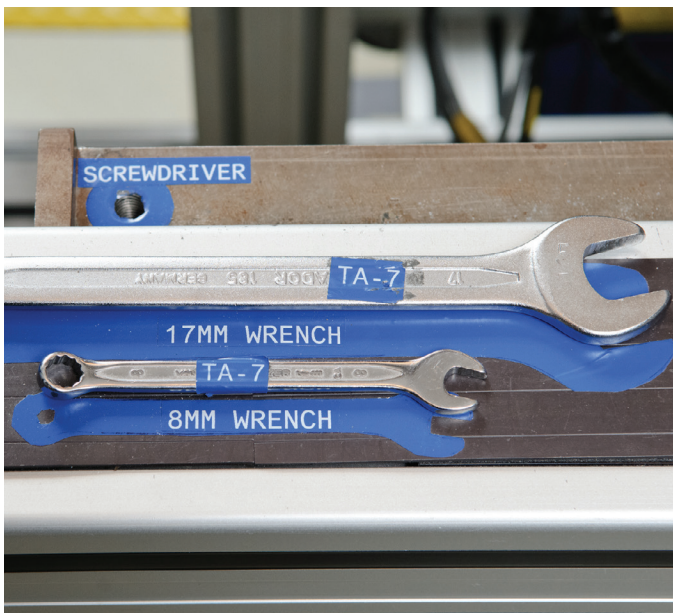
9. Frequently re-organized storage areas

Change is one of the only constants in lean. If you have storage areas that are regularly re-organized or re-arranged, use magnets or labels with repositionable adhesive.



10. Front and back of flow racks

Always mark the front of a flow rack, as this helps reduce picking errors by the person using the parts. It's also important to mark the back of a flow rack to ensure that material handlers put parts in the right place when replenishing stock.



11. Tool shadows

Use shadow board tool tape to create a shadow of your tool on your tool board. Above each tool shadow, use a label to show the name or ID number of the tool. To expedite work and reduce motion, you can also store tools right next to machines or equipment using hooks, holders and magnets.



12. Colour coded storage visuals

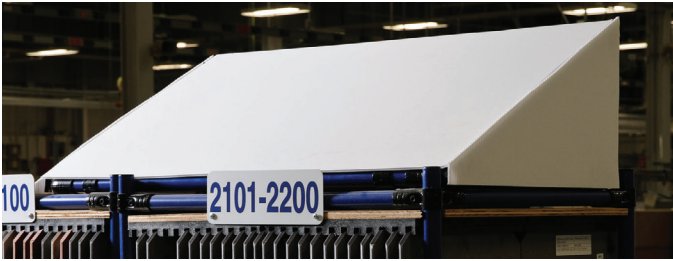
Do your tools have the habit of “walking off” to other departments? Colour code your tool board markings by department or work area; it’s easy to tell when the tool from one area gets taken to another area.



13. Inside and outside of drawers, cabinets and toolboxes

All drawers, cabinets, toolboxes, and other organizers should be marked on the outside to clearly indicate what is contained within.

Also mark the inside of your storage compartments to clearly identify where each item is properly stored. Use foam cutouts or anti-slip mats to prevent the items from rolling around and shifting in the drawers.



14. Remove cabinet doors

Consider removing your cabinet doors or replacing them with open shelving to make the contents more visible. This encourages employees to keep cabinets organized. Some companies even put angled “roofs” on cabinets to ensure that items are not inappropriately stored on top.



15. Rejects or materials on hold for QA

Mark parts and products that need to be inspected, or that have been inspected and have been rejected as defective. Brady recommends using the colour orange to indicate that inspection is needed before use; red can be used to indicate if the product has been rejected.

THIS AREA IS UNDER VIDEO SURVEILLANCE

NAME	DATE OUT	DATE EXPECTED BACK	CAMERA# OR 5S CART#	RETURNED DATE	BATTERIES CHARGED? ✓	MEMORY DOWNLOADED & DELETED ✓
Clark	8-15		TRIP00			
Tim Z	12-13	12-14	Printer 2			
Maett	3/6	3/6	#4	3/6		
Petb with car	4/5	?	(KAIZEN AREA / 5S CART#1)			
	1/10	1/17	5S CART			
for printer	1/30	?	printer #1			
			KAIZEN AREA 5S CART#2			

16. 5S supplies checkout board

5S often involves equipment that is shared between departments or work areas (e.g. label printers, cameras, etc.). You may find it beneficial to have a sign-out board for 5S supplies; it controls usage and ensures that all supplies can be quickly located when they are needed.



PEP KANBAN CARD

MATERIAL: Y211370

DESCRIPTION: B507/93, YEL, 1.53"

QUANTITY: 3000 YDS REORDER POINT: 500 YDS

1. When inventory reaches reorder point, remove card from shelf and send replenishment email to PEP_KANBAN.

2. Once material is received in, place material in proper location and replace card on shelf

Production & Inventory Control Visuals

Also called material pull or kanban visuals

MAX: DO NOT EXCEED



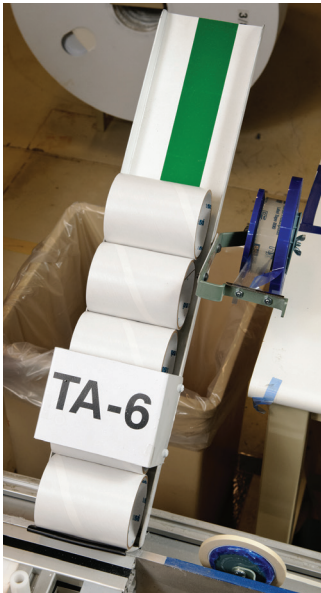
17. Maximum level indicators

Visuals can reinforce stock limits and highlight overstock situations. It can help you avoid unnecessarily high inventory levels, which tie up capital that could be used more efficiently elsewhere.



18. Minimum level indicators

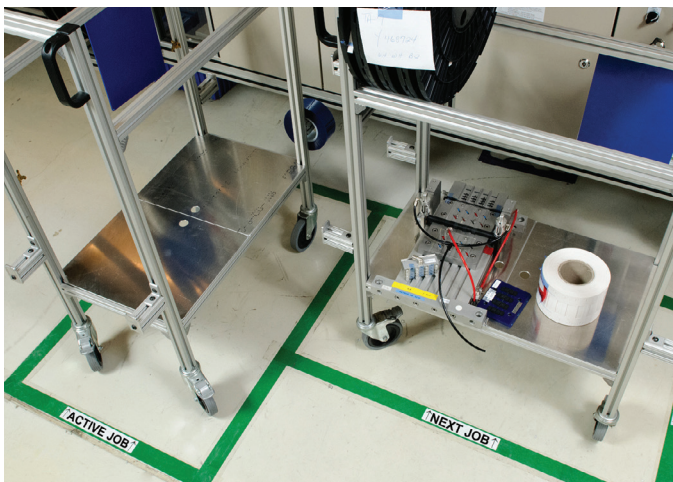
Visuals can also show the point at which stock should be reordered. If the stock fall beneath the green line, employees know that they need to reorder to ensure that replacement stock can be delivered before they run out.



19. Tricolour material pull indicators

Tricolour indicators can be used to indicate when stock is beginning to get low. They provide advanced warning to material handlers that restocking will be needed soon. In this example:

- Green signals a healthy stock
- Yellow provides a warning that the stock is getting low
- Red indicates that resupply is needed immediately



20. Batter's boxes and FIFO lanes

Lines and boxes can help sequence work with batter's boxes and FIFO (first in, first out) lanes.

Batter's box: a storage area next to a machine where the “next-up” product should be stored.

FIFO lanes: visuals that mark the staging spots in a lane of work. The number of staging spots also indicates the maximum amount of WIP that can be stored, which helps prevent overproduction.



21. Kanban cards

Kanban systems not only control inventory, but also make the reordering process more visual and efficient. Kanban cards (e.g. tags or magnets) can include product descriptions and ordering information, depending on the need.



22. Kanban labels on bins

Do you use a two-bin system to control inventory and re-ordering? Place labels on the outside of the bins to communicate information.

In this example, the empty bin is taken back to the central inventory area for replenishment. Parts do not need to be packed into intermediate transport containers or placed into other storage bins for the production line. (No more lost kanban cards!)



23. Job scheduling boards with time calculations

Displays can be used to visually sequence job orders and indicate work delays or missed deadlines. In this example, the display visually outlines the following information for employees and supervisors:

- Days that jobs are scheduled to be performed
- Planned usage
- Available capacity

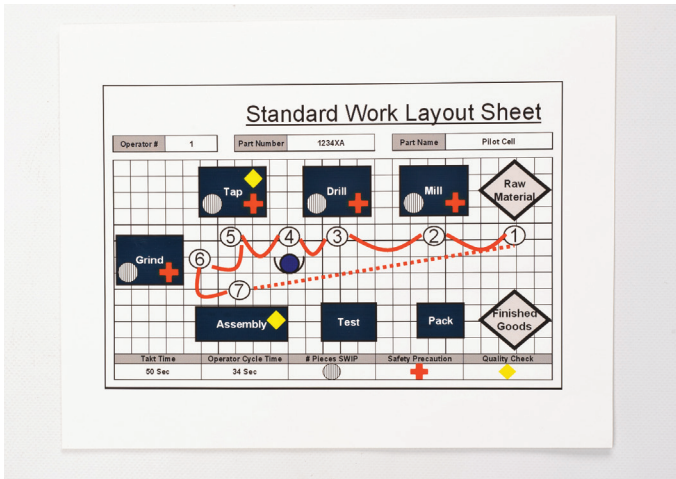


UNDER

OVER

UNDER

Work Instruction Visuals



24. Dance charts

Post standard work flow diagrams or “dance charts” in the work area to help employees remember the proper task sequence based on the number of people assigned to the cell.

TA-4 Preventative Maintenance Schedule: FEE

	Frequency	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Verify proper orientation of safety devices	Daily																	
Safety door switches	3rd shift	DR	DR	DR	DR	DR			DR	DR	DR	DR	OFF				DR	
	1st Shift	CS	CS	CS	FR	OFF			DR	CS	CS	CS	CS				CS	
	2nd Shift	FR	FR	FR	FR	FR			FR	FR	FR	FR	FR					
Emergency Stop Pull Buttons	3rd shift	DR	DR	DR	DR	DR			DR	DR	DR	DR	CS				DR	
	1st Shift	CS	CS	CS	CS	OFF			DR	CS	CS	CS	OFF				CS	
	2nd Shift	FR	FR	FR	FR	FR			FR	FR	FR	FR	FR					
Pneumatic Safety Shutoff Valves	3rd shift	DR	DR	DR	DR	DR			DR	DR	DR	DR	CS				DR	
	1st Shift	CS	CS	CS	CS	OFF			DR	CS	CS	CS	OFF				CS	
	2nd Shift	FR	FR	FR	FR	FR			FR	FR	FR	FR	FR					
Verify correct operation and adjustment of the following sensors, adjust and clean as needed:	Daily																	
Cardstock out of material photo-eye	1st Shift	CS	CS	CS	CS	FR			FR	CS	CS	CS	CS				CS	
Inner and outer tape sensors	2nd Shift	FR	FR	FR	FR	FR			FR	FR	FR	FR	FR					
Tube out of material photo-eyes	3rd shift	DR	DR	DR	DR	DR			DR	DR	DR	DR	FR				DR	
Conveyor home sensors	1st Shift	CS	CS	CS	CS	FR			FR	CS	CS	CS	CS				CS	
Tube feed photo-eyes	2nd Shift	FR	FR	FR	FR	FR			FR	FR	FR	FR	FR					
Clean cardstock platform and splice tape tables	Daily/3rd Shift	DR	DR	DR	DR	DR			DR	DR	DR	DR	DR				DR	
Check scrap tube bags, empty as needed	Daily/2nd Shift	FR	FR	FR	FR	FR			FR	FR	FR	FR	FR					
Check tube brushes, service as required	Daily/3rd Shift	DR	DR	DR	DR	DR			DR	DR	DR	DR	FR				DR	
General machine housekeeping	Daily/1st Shift	CS	CS	CS	CS	FR			FR	CS	CS	CS	CS				CS	
Verify pneumatic pressure settings	Weekly/1st Shift	CS							FR								CS	
Inspect and clean nip rolls	Weekly/2nd Shift	FR							FR									
Clean and check vacuum conveyor belts	Weekly/3rd Shift	DR							DR								DR	
Check vacuum filter service as required	Weekly/1st Shift	CS							FR								CS	
Check oil level / leaks in gear box	Monthly/2nd Shift	FR																
Check pneumatic filters. Service as needed	Monthly/1st Shift	CS																

25. Schedules and check sheets

Schedules show which employees should be performing certain tasks – and when those tasks should be done. Check sheets can also be used to provide a visual indication that tasks are being completed.

BRADY LOCKOUT TAGOUT PROCEDURE
SAMPLE

Developed by	Reviewed by	Revised by
BRADY	BRADY	

Description: Boiler #1
Location: Boiler Room
Equipment #: 180-0012
Rev: 0 (Date: N/A)
Origin Date: 9/3/08

4 LOCKS & TAGS NEEDED

DANGER
Steam pressure and burn hazard. Ensure steam and heat have dissipated before proceeding.

NEXT AUDIT DUE: SEP 2009 NEXT AUDIT DUE: SEP 2010 NEXT AUDIT DUE: SEP 2011 NEXT AUDIT DUE: SEP 2012

North Wall South Side View North West Side View

ALWAYS PERFORM A MACHINE STOP BEFORE LOCKING OUT DISCONNECTS

ID	Source	Location	Method	Check	Device
E-1	Electrical 480V	Disconnected located at the MCC located on North Wall	Move E-1 disconnect to off. Lock out.	Attempt restart at CP-1.	Lockout Hasp and Lock
W-1	Hot Water Supply	Disconnected Above the Boiler. Valve on West Side.	Turn W-1 valve off. Lock out.	Verify pressure has bled off.	Cable Lockout
W-2	Hot Water Return	Disconnected Above the Boiler. Valve on West Side.	Turn W-2 valve off. Lock out.	Verify pressure has bled off.	Cable Lockout
G-1	Gas Natural Gas	Disconnected on West side of Boiler unit.	Turn G-1 valve off. Lock out.	Verify pressure has bled off.	Universal Ball Valve Lockout

CP = CONTROL PANEL E = ELECTRICAL W = WATER P = PNEUMATIC C = CHEMICAL V = VALVE G = GAS S = SYSTEM

DANGER OPENING A GUARD DOES NOT CONSTITUTE A LOCKOUT!
Any machine modification must be done by personnel trained in the operation.

BRADY *Safety Is Your Responsibility!* 800-458-4040

26. Procedures

If the steps associated with performing a task are challenging to follow, make sure you have detailed procedures available. Procedures should include:

- What the employee needs to do
- Order in which it should be done
- Amount of time it takes to do the task (or how frequently it should be done)
- Desired outcome



27. One point lessons

If employees are struggling to remember one step in a procedure, consider creating a “one point” or “single point” lesson. A one point lesson is different from a typical procedure in that it focuses on one critical point.



28. One point labels

One-point lessons are typically depicted as standard letter size documents. However, they are even more effective when you condense the critical information onto a label or set of labels. Then you can post the information right at the point of need — exactly where your employees can benefit from it.



Equipment Care Visuals (TPM)



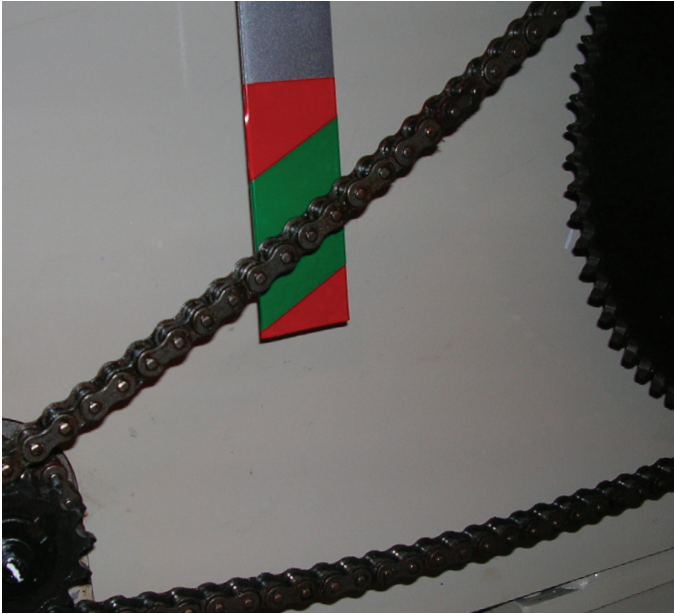
29. Lube points

Mark lubrication points with a label that identifies the proper grease quantity and frequency. To ensure that the correct lubricant is used, consider also colour coding the lube point label to match the label on the appropriate grease gun.



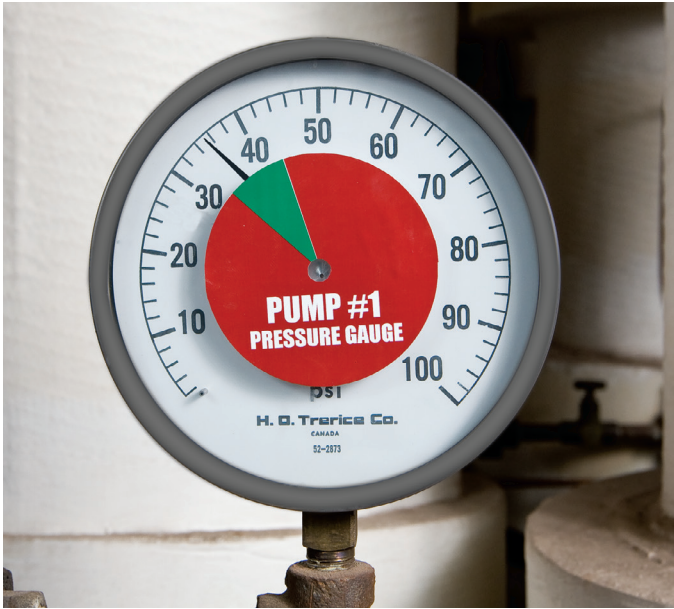
30. Oil level indicators

Place a green and red striped label behind the oil sight tube to help operators quickly detect when oil levels are too high or too low. The optical properties of the oil cause the stripes to enlarge and deflect downward, making it easy to tell whether the amount of oil fails in the green “good-to-go” range.



31. Drive tension guides

Drive tension guides help operators inspect for proper tension on the drive system. Using red and green colour blocks, these visuals indicate when a chain or belt needs to be tightened or replaced.



32. Gauge labels

Adding a simple gauge label enables any employee to easily detect abnormalities at a glance and at a distance. Without the label, only a trained inspector would know if the temperature or pressure setting is correct.



33. Normal / safe state visuals

Visuals can indicate whether valves and air dumps are normally closed or open. These visuals help prevent accidents when employees are putting equipment into a safe working condition (or zero energy state).



34. Predictive maintenance targets

It's essential that the location of your preventative maintenance readings remains consistent. The use of predictive maintenance targets ensures that vibration and ultrasound probes are positioned for maximum repeatability, regardless of who takes the reading.



35. Replacement part visuals

Roughly 25% of equipment downtime can be attributed to parts-related issues (identifying the correct part, looking for parts, ordering parts, etc.). Much of this wasted time can be eliminated by placing labels on the equipment that clearly identify the correct replacement parts.



EXPLOSIVE DUST AREA
BEYOND THIS POINT

This sign features a yellow background with a black triangular warning symbol on the left containing a stylized explosion. The text is in bold black capital letters.



NO OPEN SPARKS
BEYOND THIS POINT

This sign features a yellow background with a black circular prohibition symbol on the left containing a flame. The text is in bold black capital letters.



CO₂ FIRE SUPPRESSION
IN THIS AREA

This sign features a red background with a white exclamation mark inside a white circle on the left. The text is in bold white capital letters.



DUST MASK REQUIRED
BEYOND THIS POINT

This sign features a white background with a blue circular icon on the left showing a person wearing a dust mask. The text is in bold blue capital letters.

Safety Visuals



36. Proper formatting of safety visuals

Safety visuals should always include:

- Name of hazard
- Magnitude of hazard
- Potential consequences
- Pictograms
- Instructions for avoiding hazard

Any text should be formatted with sentence caps and left justification for easy legibility.



37. Point-of-need safe work instructions

Hazard warnings and safe work instructions should be posted at the point of need - right where the hazard exists for your employees.



38. Safety and fire protection equipment visuals

Fire fighting equipment, eye wash stations, first aid stations, safety showers, and other safety equipment should be clearly marked with signs to help employees easily locate them throughout the facility.



39. Safety and fire protection equipment floor markings

Use red and white striped floor tape to mark off the areas in front of safety equipment and fire fighting equipment that must be kept clear, per OSHA requirements.



40. Hazardous areas or equipment

Use a black and yellow striped marking as a border around any area or piece of equipment where employees may be inadvertently exposed to a special hazard. The black and yellow border indicates that special caution should be exercised when entering and working in the area.

R LIGHTS



41. Electrical equipment

All electrical equipment should also be marked with both shock and arc flash hazard warnings, as required by NFPA70E and the National Electric Code.

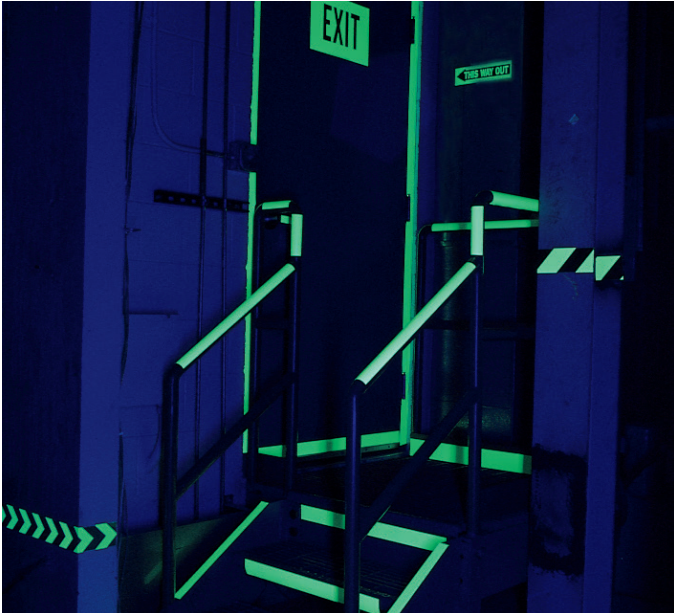


Facility and Process Visuals



42. Way finding

Post direction or way finding signs throughout your facility to help people find their way around the building. Mark all of your rooms and offices with visual identifiers, and then post facility diagrams throughout your facility to help people pinpoint where they are.



43. Emergency egress markings

Your facility should have emergency egress markings to help people safely exit in the event of an emergency. According to IBC/IFC regulations, exits and exit access doors must be marked with approved exit signs. Egress pathways and stairwells should also have glow-in-the-dark markings to facilitate safe exits in dark “lights out” conditions.



44. Production processes and work cells

All processes and work cells should be properly identified so everyone can easily understand the content and sequence of the work being performed. Visuals should include:

- The name of the area or cell
- What type of work is performed
- What type of product is produced
- The next upstream or downstream process (if applicable)



COMPRESSEUR D'AIR N° 1
ACP-1
DÉCONNEXION : INTERRUPTEUR 237



**INTERRUPT-
TEUR 237**
ACP-1 DÉCONNEXION PRINCIPALE

45. Electrical disconnects

Every piece of equipment that is electrically-powered should be marked with a label that states the location of the disconnect switches or other energy isolating devices. This helps ensure that the equipment is properly de-energized before servicing, avoiding accidents and possibly even saving lives.



46a. Pipe Marking

While ANSI standards only require that the content and direction of flow be shown on pipe markers, it can be useful to also indicate the source and destination points. This simplifies and expedites the process of tracing pipes through the facility when you need to shut down a specific section or process.



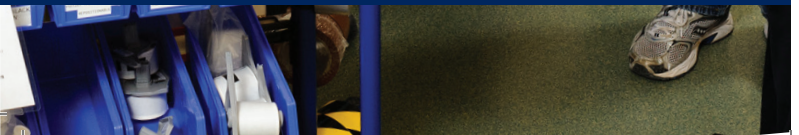
46b. Equipment ID

Visual devices should be placed directly onto your equipment to facilitate easy asset care and management. The benefits include:

- Asset tracking
- Clear direction when reporting problems (enabling maintenance people to readily know which machine to investigate)
- Better equipment histories (If maintenance and repair tasks are tracked, identifying the equipment ensures that the data is properly assigned.)



Kaizen Continuous Improvement Visuals





47. LDM Boards

Format your lean daily management boards to not only track metrics, but to also drive improvement! Consider maintaining 4 charts for each metric that is important to that area:

- Chart #1: A trend chart comparing actual metrics to goals over time (day, week, month, etc.).
- Chart #2: A living pareto chart, which includes issues that have been identified and the frequency of their occurrence so problems can be prioritized.
- Chart #3: A sheet that guides employees through root cause analysis and problem solving.
- Chart #4: An action plan spreadsheet that outlines existing countermeasures, along with their owners, due dates and statuses.

KAIZEN IDEA BOARD

SAFETY IDEAS		OTHER IDEAS		EASY-HIGH IMPACT		HARD-HIGH IMPACT	
<p>Post-it notes for Safety Ideas</p>		<p>Post-it notes for Other Ideas</p>		<p>Post-it notes for Easy-High Impact</p>		<p>Post-it notes for Hard-High Impact</p>	
				EASY-LOW IMPACT		HARD-LOW IMPACT	
				<p>Post-it notes for Easy-Low Impact</p>		<p>Post-it notes for Hard-Low Impact</p>	

P
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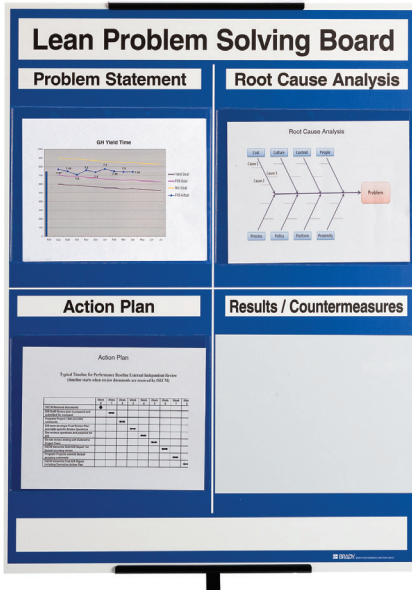
ASSIGNED ACTIVITIES

	TASK	LEADER	DUE	STATUS
1	Update Exit Signs	Tom S.	5/12	-Half of facility updated -Need more signs
2	Teach new LOTO Procedures	Rick	5/12	-in progress
3	Floor tape	Sue L.	7/12	-ordered new floor-tape.

COMPLETED

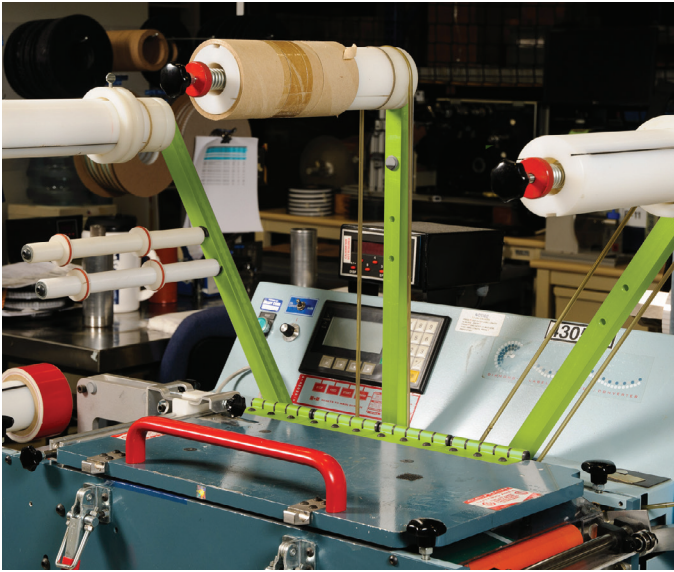
48. Kaizen idea boards

A kaizen idea board keeps employee suggestions and follow-up actions visible to both managers and employees. In this example, kaizen ideas are written on Post-It notes, placed in the large box on the left, and reviewed by managers at a regular time interval (i.e. every day, every week). They are prioritized using the 4-box block, and up to 3 ideas are acted upon at a time.



49. A4 Boards

A4s are documents that can assist with problem resolution. They document the root cause analysis and outline the countermeasures that were put in place to correct the problem. It can be very beneficial to display this type of information to promote visibility and input from a larger group.



50. “Kaizen painted” equipment

Any time a piece of equipment is kaizened or improved, paint that item a different colour. Over time, more and more equipment in your facility will be changed to the new colour, dramatically highlighting the impact of the kaizen activity and reminding your team of the progress they’ve made over time.



Learn more at www.BradyID.com/visualworkplace.

Visit our website for additional information on visual workplace, 5S workplace organization and other lean manufacturing initiatives.

You'll find a variety of other downloads that can help you with your lean journey, including:

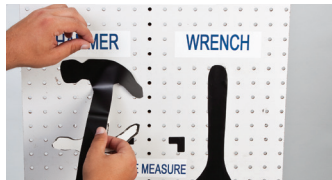
- Articles
- Web casts
- Handbooks
- And more!



Brady Printing Solutions

The right printing solution can be essential to creating a visually instructive workplace. Whether it's a small handheld printer or a versatile benchtop printer, Brady has an easy-to-use visual solution to print signs, labels, tags and more on site and on demand. Brady printers help create professional-quality visuals that are easy to read and consistent throughout the workplace.

For more information:
www.BradyID.com/visualworkplace



Brady offers a variety of visual workplace products, including:

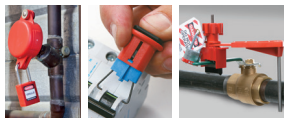
ToughJet™ Adhesive Sheets: Just print, peel and stick! Create durable, professional-looking signs, charts and more with your inkjet printer.

ToughStripe® Floor Marking Tape: ToughStripe Floor Tape is extremely durable and can withstand forklift traffic better than other tape-based marking solutions.

Tool boards and Workbench Marking Supplies: Durable, self-adhesive vinyl sheets and tapes designed for a variety of non-floor applications.

For more products:
www.BradyID.com/visualworkplace

BRADY – YOUR COMPLETE WORK SAFETY SOLUTION PROVIDER



LOCKOUT/TAGOUT FOR HAZARDOUS ENERGY CONTROL

Brady offers full support and a broad range of products to create your advanced work safety environment.



VISUAL TAGGING SYSTEMS

Provide essential records of the safe condition of all your site equipment and scaffolding.



SAFETY SIGNS

We offer more than 8,000 different signs for safety, maintenance and facility identification.



PIPE MARKERS

Easily identify pipe content and flow direction.



SMART SPILL CONTROL

Clean, fast and safe removal of oil, water and chemicals spills.



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BRADY Benelux

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