



TURTLE PLASTICS®

Safety & Stabilization Product Solutions



Fundamental Principles of Equipment Cribbing & Blocking Best Practices Utilizing Turtle Plastics'

Dura Crib™ Products

2024

Before Starting...

- Understand basic cribbing & blocking terms.
- Follow three fundamental principals.



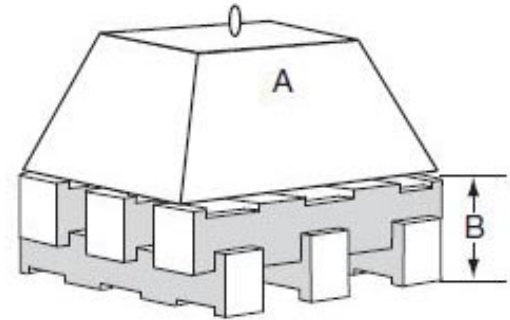
BASIC TERMS

WE MUST KNOW THE LOAD RATINGS OF EACH BLOCK THAT IS USED TO CREATE A CRIB STACK AS COMPARED TO THE LOAD/WEIGHT REQUIREMENT OF EACH MACHINE OR EQUIPMENT IN ORDER TO UNDERSTAND CRIBBING FEASIBILITY.

- ❖ **BLOCKING** - Also referred to as “cribbing,” is a stabilization method which has traditionally been wood or another material used to create a configuration (usually a platform) to help support machinery and equipment. For this presentation we refer to cribbing as the Turtle Plastics Dura Crib brand of products, that include blocks, chocks and pads.
- ❖ **WORKING LOAD** - Also known as "design load" or "safe load", is generally a fraction of the "ultimate strength." “Ultimate strength” refers to the force required to cause complete failure of a supporting structure. “Workload” determines the size and number of box cribs required. “Workload” should be no more than 1/3rd of the "ultimate strength.”
- ❖ **CENTER OF GRAVITY** - The center of gravity (CoG) is a theoretical point of an object, which engineers use for convenience in calculations, as the single point where all of that object’s weight is concentrated.

BASIC TERMS

- **BOX CRIB** - Commonly constructed using a “3 point” crisscross of cribbing blocks positioned at 90-degree angles. The arrangement may be square or rectangular. Whenever possible, crib blocks should be built in a square or rectangular shape to maximize load capacity, stability, and safety. When properly built, cribs transfer the load perpendicular to the cribbing blocks, resulting in an even compressing of the crib.
- **POINT SOURCE LOADING** - When energy of an object bearing down onto the crib stack is uneven or isn't positioned in a manner where weight is distributed evenly across the box crib. Point source loading can cause the crib block or crib stack to fail irrespective if the block is made from wood or engineered material. Another example of point source loading is placing the block under a single point of contact where there is a sharp object such as a screw or bolt which then pierces the cribbing block causing the block to fail.





UNDERSTAND POINT SOURCE LOADING AND IMPACT ON CRIBBING APPLICATIONS

Examples of Point Source Loading

- ❖ When an object is placed onto or under a crib block or crib stack and positioned in a manner where the weight of the object is not distributed evenly across the block/stack resulting in a single point of energy bearing down.
- ❖ Not placing crib blocks to the center of gravity of the equipment.
- ❖ Placing too much weight of the equipment onto one block/stack.
- ❖ Placing the block or stack under or over a single point of contact where there is a sharp object such as a screw or bolt which then pierces the cribbing block/stack causing the block/stack to fail.
- ❖ When different cribbing blocks with differing working loads are used to create the box crib. The load strength of the box crib goes to the lowest working load crib block. Therefore, if the weight of the load being lifted exceeds the lowest block working load, then the force of the load will gravitate to the lowest load bearing block causing the crib stack to fail.



Point source loading can cause the crib block or crib stack to fail irrespective if the block is made from wood or engineered material.





FUNDAMENTAL PRINCIPLE #1 OF PROPER CRIBBING AND BLOCKING



**Know when the
equipment is the
“IDEAL
CANDIDATE”
for blocking and
cribbing
maneuvers.**



*Read and understand the equipment manufacturer's operator's manual.



*Understand your organization's guidelines/policies for repair and maintenance of the equipment.



Understand block manufacturer's guidelines on product suitability.

FUNDAMENTAL PRINCIPLE #2 OF PROPER CRIBBING AND BLOCKING



Know when the equipment is the **“IDEAL SITUATION”** for blocking and cribbing maneuvers.



- ❖ The “Ground up Principal”
- ❖ Identify ideal ground conditions. Establish there is firm and solid ground conditions to support the blocking.
Will the crib be level on this ground condition *before and after* the blocking maneuver?
- ❖ Short term cribbing application (less than 30 days).

FUNDAMENTAL PRINCIPLE #3 OF PROPER CRIBBING AND BLOCKING



Follow **“LOCK OUT/TAG OUT” (LOTO)**

recommendations for the equipment before starting any cribbing/blocking maneuver.



- ❖ Prepare for shutdown.
- ❖ Notify all affected employees of the activities and equipment involved.
- ❖ Shut down the equipment.
- ❖ Isolate the equipment from the hazardous energy source.
- ❖ Dissipate residual energy.
- ❖ Apply applicable lockout or tagout devices.
- ❖ Verify that the equipment is properly isolated.



DURA CRIB PRODUCTS OSHA COMPLIANT FOR “LOCK OUT/TAG OUT”

“When used correctly, Dura Crib brand of products can create a compliant and safer work environment by providing technicians who repair equipment with a proper ‘lock out tag out’ of stored energy. This type of hazardous energy is created when hoisted or jacked equipment is not given a secured platform. Wood cribbing does not interlock, is not tested, and is subject to unseen degradation via environmental factors or absorption of fluids. All these factors create an unsafe and unpredictable work surface that cannot contain stored energy. Under 29 CFR 1910.147 LOTO, for stored energy not being controlled and ‘locked-out’ can also be used as the basis of a citation.”

Angelique Bracer, COHC, SHS

WHY WOOD IS NOT IDEAL FOR LOCK OUT/TAG OUT

- ❖ Doesn't interlock to reliably contain hazardous energy.
- ❖ Inconsistent load rating based on species.
- ❖ Inconsistent load rating based on environmental factors.
- ❖ Splinters, rots, degrades with age.
- ❖ Can contain creosote or other hazardous fluids.
- ❖ Can not be decontaminated without compromising integrity of block.



WHAT CAN GO WRONG...

A tire contractor was seriously injured when the front-end loader he was repairing fell on him. The front-end loader had been lifted and placed on wood cribbing to repair a flat tire. The contractor was underneath the loader to adjust one of the lifting jacks when the wood cribbing shifted, causing the loader to fall. The tire contractor was struck, and his hard hat became wedged between the cribbing and loader frame.



Photo from the Mine Safety and Health Administration – April 2018.

DURA CRIB PRODUCT ADVANTAGES OVER WOOD

- ❖ Engineered with a reliable and repeatable formula for consistent performance.
- ❖ Interlocking facades to create an OSHA compliant “lock out/tag out” mechanism.
- ❖ Lab tested for working load limit.
- ❖ Safely decontaminate products with an agent on the EPA List-N.
- ❖ Do not splinter or rot.
- ❖ Warrantied.
- ❖ Sustainably made in the USA with 100% recycled plastic.
- ❖ Material is Berry Amendment, Prop 65 and Reach Compliant.

CRIBBING GUIDELINES

The US Army Corp of Engineers States to never crib higher than 2-3 times the base width of crib base.

**FORMULA = i.e., Super Crib
= 6"x7"x24" nominal**

**3 CRIB BLOCK BASE with
platform base= 20"**

**CRIB STACK HEIGHT = 60"
Max – Recommend no higher
than 48" when possible.**

**Blocking shall be of
sufficient thickness, width,
and length to prevent
shifting, toppling, or
excessive settlement of the
load.**

**Blocking shall be of
sufficient strength to
prevent crushing, bending
failure or shear failure, and
to adequately transmit the
load's weight to the
supporting surface.**

**Use a ground pad and top
cribbing stack pad to help
dissipate load and reduce
the risk of "point source
loading."**

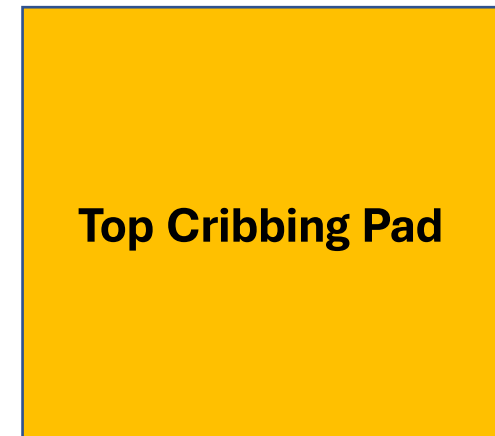
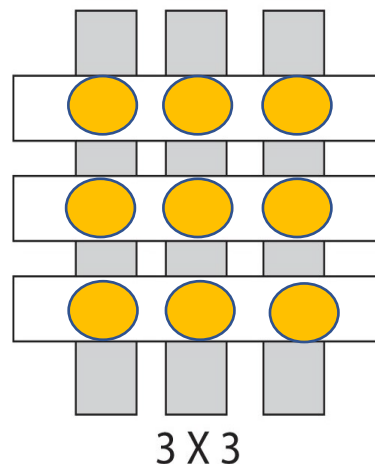
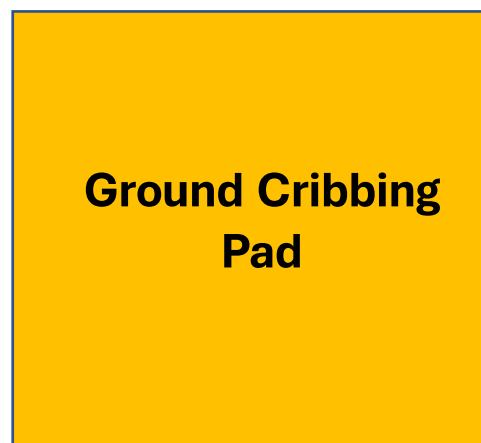
US ARMY CORPS OF ENGINEERS GUIDELINES STACKING CONFIGURATION USING DURA CRIB BLOCKS

The 3x3 also known as a “9-point” box crib stack.

Consists of 3 Dura Crib blocks laid as a base or preferred technique is to lay 3 blocks onto a bottom plate of solid material.

Lay 3 additional Dura Crib blocks perpendicular to base blocks forming 9 points of contact onto the stack (at the intersection of base blocks to top blocks).

Use a ground pad and top cribbing stack pad to help dissipate the load and reduce the risk of “point source loading”.



KNOW PRODUCT WARNINGS ASSOCIATED WITH LIFTING OPERATIONS USING DURA CRIB PRODUCTS.


WARNING: CRUSH HAZARD

	<p>BEFORE USING PRODUCTS, READ YOUR EQUIPMENT OWNER'S GUIDE AND YOUR ORGANIZATION'S POLICIES AND PROCEDURES FOR THE USE OF THESE PRODUCTS AND FOR ANY WARNINGS OR SIGNAGE THAT NEEDS TO BE POSTED WHILE PRODUCTS ARE IN USE.</p>
	<p>DO NOT USE ANY DURA CRIB BRAND PRODUCTS FOR CRIBBING, SHORING OR STABILIZATION APPLICATIONS WITH ANY MEDIUM TO HEAVY-DUTY CRANE EQUIPMENT.</p>
	<p>AN UNEVEN GROUND SURFACE CAN CAUSE PRODUCTS TO SHIFT DURING AN APPLICATION CAUSING DAMAGE TO EQUIPMENT AND/OR INJURY/DEATH TO WORKER.</p>
	<p>ENSURE THAT THE WEIGHT OF THE LOAD BEING LIFTED IS EVENLY DISTRIBUTED ACROSS THE BLOCK OR CRIB STACK - AVOID LOADING ONTO A SINGLE POINT OF CONTACT ON THE CRIBBING BLOCK.</p>
	<p>PRODUCT WORKING LOAD LIMITS ARE MAXIMIZED IN A 77-DEGREE FAHRENHEIT (25-DEGREE CELSIUS) ENVIRONMENT; TEMPERATURES ABOVE OR BELOW WILL DECREASE WORKING LOAD LIMITS.</p>
	<p>YELLOW DURA CRIB® PRODUCTS HAVE A REDUCED WORKING LOAD AS COMPARED TO THE BLACK DURA CRIB PRODUCTS.</p>
	<p>DO NOT USE DURA CRIB BLOCKS OR PADS ON THEIR VERTICAL END. DO NOT DRILL INTO OR MODIFY PRODUCTS.</p>



WARNING

ROLL OVER/TIPPING HAZARD



- To avoid rollover or tipping, and before using step chock product components, ensure products are on level and solid ground and use shoring when necessary to firmly stabilize equipment.
- Avoid shifting the center of gravity and flipping of equipment during cribbing maneuvers.
- Do not leave equipment unattended during an active cribbing application.

SAFETY & PROPERTY DAMAGE AVOIDANCE USING DURA CRIB PRODUCTS.

- ❖ Do not overload Turtle Plastics' cribbing products.
- ❖ Do not cut, drill, or bolt into products.
- ❖ Ensure the Manufacturer's Working Load Limit identification tag is affixed to the product at all times. Request a complimentary tag from Turtle Plastics or your distributor if needed.
- ❖ When applicable, check that the product lanyard is intact before lifting the block by the lanyard.
- ❖ Use the correct personal protective equipment when conducting lifting or stabilizing maneuvers.
- ❖ Whenever possible, avoid intermixing cribbing materials. Due to the differences in material compression and coefficient of friction, extreme care must be exercised when intermixing wooden or other types of plastic or metal cribbing with Dura Crib products.
- ❖ Use caution on uneven surfaces.
- ❖ Do not replace damaged component parts with component parts other than those made by Turtle Plastics.
- ❖ Do not leave Dura Crib products unattended during active load or lifting operations.
- ❖ Do not leave Dura Crib products in an actively loaded stacked configuration for longer than 30 days. Always check to ensure blocks are sustaining load.
- ❖ Do not clean products with any product other than a cleaning solution from EPA List N for plastic.

GENERAL BEST PRACTICES

- Box cribs are a temporary, short-term means of creating safety redundancy to jacks and stands in lifting operations.
- If cribbing products are the primary stabilization mechanism, ensure that whatever is on the crib stack is not left unattended or for prolonged periods of time.
- Ensure that blocking material is competent, substantial, and adequate to support and stabilize the load.
- Understand that temperature can affect working load (always reducing it).
- Establish and discuss safe work procedures.
- Ensure ground is level and solid.
- Examine work areas and identify and control all hazards before starting any work.
- Read and become familiar with equipment manuals.
- Post the working load guide in an area where blocks are being used.
- Always inspect cribbing prior and during use.
- Whenever possible, do not place yourself in a position that will expose you to hazards during the lift or performing the maneuver.
- Monitor personnel routinely to determine that safe work procedures are followed.
- Maintain good communication between co-workers.
- Ensure that your operators have the appropriate training.

Let's work
together
so
everyone
stays safe.

