



UNC CHARLOTTE

Department of Engineering Technology

LABORATORY SAFETY ANALYSIS

OPERATING A CONCRETE TESTING MACHINE



Location: Smith 133

Required Training: The Forney concrete testing machine is designed and intended for use by properly trained and experienced operators. If you are not familiar with the proper and safe operation of this device, do not use until proper training and knowledge have been obtained.

Required Personal

Protective Equipment (PPE): Safety glasses, closed toed shoes, dust mask

Reference Materials: Manufacturer's safety rules and operating instructions

PHOTOS	TASK	HAZARDS	CONTROLS
	Wear clear safety glasses with side shields.	Flying debris	<ul style="list-style-type: none"> Students are required to provide their own safety glasses. See laboratory instructor or laboratory manager if you do not have safety glasses before proceeding to use equipment.
	Inspect safety glasses for cracks, scratches or other damage. Ensure the ANSI standard Z87.1 is stamped into the side of glasses. If necessary inspect dust mask or face mask.	Flying debris	<ul style="list-style-type: none"> If defects are found report this to your lab instructor before using.
	Put on PPE	Flying debris and heavy objects	<ul style="list-style-type: none"> Always wear safety glasses. Always wear closed toed shoes when handling test specimens, test fixtures, or other heavy attachments.
	Inspect work area, walk around test machine looking for debris and ensure proper lighting.	Slips, trips & falls	<ul style="list-style-type: none"> Keep the work area around the test machine free from scraps, dust, oil and grease.
	Check manual controls	Injury, pinch points	<ul style="list-style-type: none"> Check for proper functioning of manual controls used to position crosshead. Always keep hands/fingers away from fixtures or platens when adjusting crosshead
	Insert sample specimen	Injury, pinch points	<ul style="list-style-type: none"> Use proper fixtures, spacer plates, and caps for each test specimen. Keep fingers from being in between specimen and platen when loading test

			specimen. <ul style="list-style-type: none"> • Ensure that the test specimen is stable (not wobbly) before beginning test.
	Run Test	Flying debris	<ul style="list-style-type: none"> • Always wear safety glasses throughout the test. • For all specimens that fit within the test limits of the loading platens, make sure all safety guards are in place and latched. (Use caution when conducting Modulus of Rupture testing since the front and back guards remain open)
	Remove specimen	Cuts	<ul style="list-style-type: none"> • Return crosshead to starting position to insure adequate workspace. • Broken specimens can have sharp edges, sharp points, or splinters; handle with caution when removing.
	Turn machine off	Injury	<ul style="list-style-type: none"> • When all testing is completed, turn the machine off, as crosshead may be activated whenever power is on.
	Clean work area and return all PPE to a clean, dry storage	Injury	<ul style="list-style-type: none"> • Ensure adequate housekeeping measures to prevent accidents. • Remove broken/used specimens to a safe storage area.
	Changing machine setups (i.e. changing compression head to flexural head)	Injury	<ul style="list-style-type: none"> • Please see the attached Appendix A for safe procedures

For more information about this LSA, contact the *Department of Engineering Technology* at UNC Charlotte (704) 687-2305

Please visit our website at: <http://www.et.uncc.edu>

The development of Laboratory Safety Analyses is a very effective means of helping reduce incidents, accidents, and injuries in the workplace. It is an excellent tool to use for training purposes and can also be used to investigate "near misses" and accidents.

Appendix A

Forney Switching Procedures

Tools required:

- 3 people
- Blue platform lift (from Wes Maxwell)

Procedure 1 – From compression to flexural testing

Steps:

- 1) Remove all steel plates.
- 2) Turn black wheel counter-clockwise until compression head is lowered onto the stainless steel base.
 - a. It may be easiest to stand on top of the counter to lower the compression head.



- 3) Turn connecting screw counter-clockwise until the screw releases from the compression head.



- 4) Lift connecting screw assembly from the Forney machine and set aside.



- 5) With the platform lift situated in front of the machine and one person holding the lift, two people lift and remove the compression head from the machine and place on the platform lift. The platform lift and compression head can be set aside.



- 6) With one person behind the machine, two people lift the flexural head into place. A third person will use the wrench to tighten the set-screw that holds the flexural head into place.



- 7) Place 4-5 steel plates on the steel base. Lift and place the flexural head on the steel plates (this takes two people).



- 8) Ensure that there is enough room to properly place a beam into the machine. The protective doors will not be able to close while performing a flex test.



Procedure 2 – to go from flexural testing to compression testing

Steps:

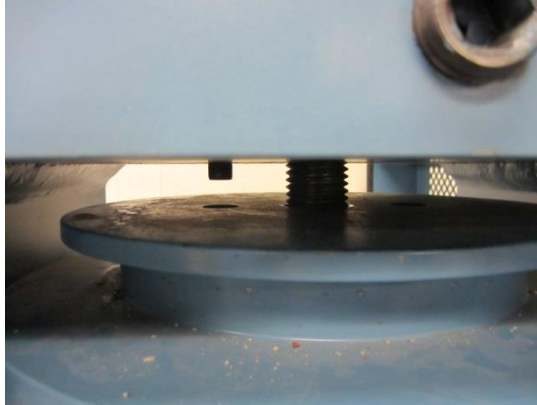
1. Remove the flexural head from the machine (this takes two people). Remove the steel plates from the base.
2. With one person behind the machine and another in front of the machine, a third person will loosen the set screw that holds the flexural head in place. Lower the flexural head onto the stainless steel base then remove it from the machine.
3. With the platform lift situated in front of the machine and one person holding the lift, two people lift the compression head from the platform lift and place on the stainless steel base.



4. Insert the connecting screw at the top of the machine and turn clockwise until it locks into the compression head.



5. Turn the black wheel clockwise until the compression head is lifted to the top of the machine. Ensure that the compression head is properly aligned at the top of the machine.
 - a. It may be easier to stand on top of the counter to raise the compression head.



6. Tighten the black wheel and connecting screw. The set screw on the front of the machine can be tightened at this time.