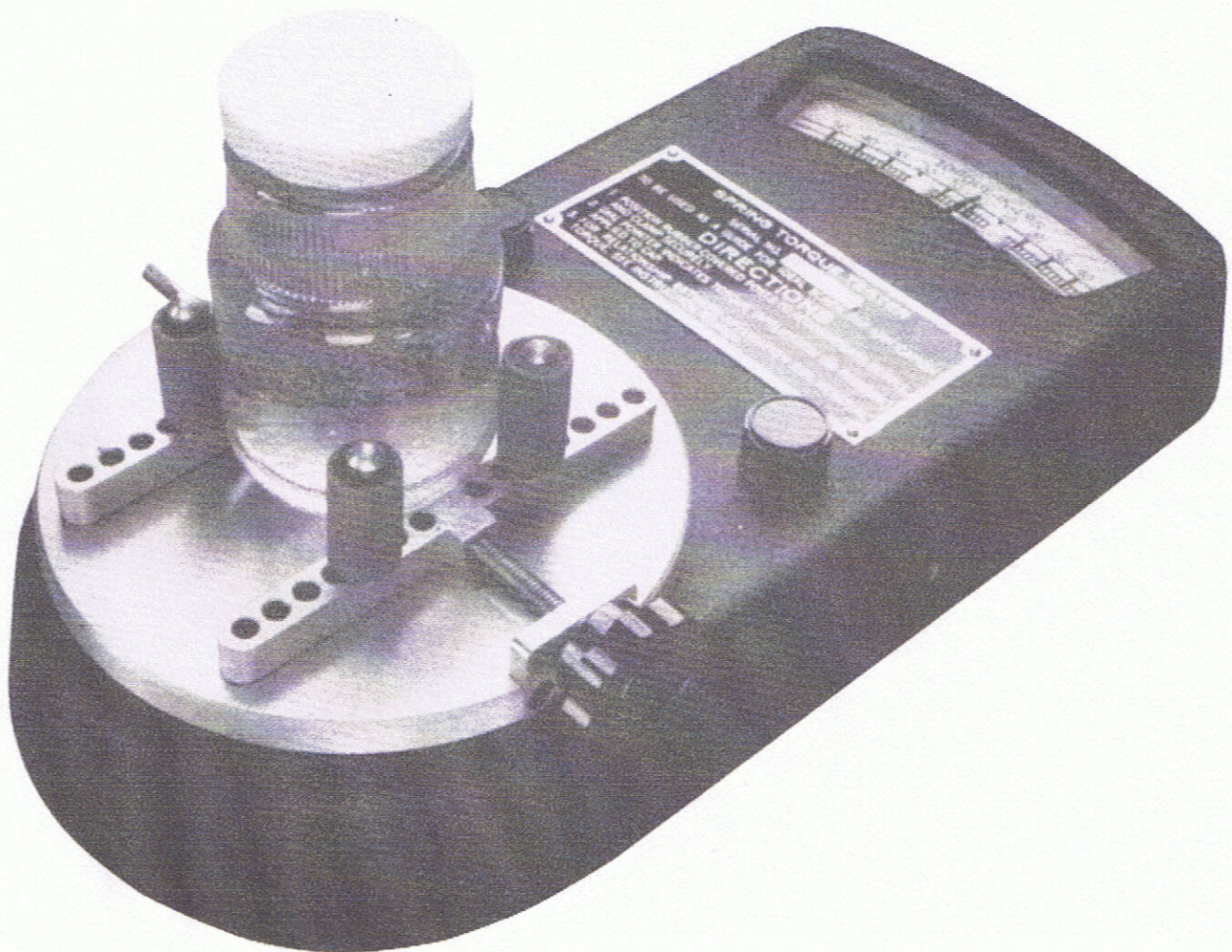


SPRING TORQUE TESTER Product Manual

GAMMA SCALE

www.gammascale.com



Spring Torque Tester

The Spring Torque Tester is designed for control of cap tightness – an essential factor in bottling operations.

- Minimum tightness is essential to avoid evaporation or leakage of product.
- Excessive torque may break molded closures.
- Caps applied too tightly may be difficult to remove.

Bottling Line Control

Regular testing of packages from each bottling line makes certain correct tightness is maintained at all times. Some bottlers make a check on each line each hour of operation.

Since capping machine chucks operate as independent units, it's best to test packages from each chuck. In routine checking, this may be accomplished by simply taking the requisite number of bottles from the line.

To determine the amount of torque required to loosen the cap, follow the recommendations of your closure manufacturer. Apply the torque gradually so as to read the maximum force used in loosening the cap.

While at least 5 duplicate tests are necessary in order to establish a reliable average for any set of conditions, adequate control of the line may be possible with fewer tests. For example, if testing of each line is done once an hour, 1 to 3 tests from each chuck may be adequate to determine if adjustments are needed. Experience with a specific operation can identify the amount and frequency of testing needed.

Correct Cap Tightness

Removal torque is affected by many factors other than how tightly the cap is applied. Such factors include the style of caps and bottles used, type of liner, product being packed, and time after tightening and conditions of storage. In other words, *removal torque alone* becomes a measure of how tightly the cap was applied only when other factors are known or controlled.

Recommended Procedure:

Select 10 bottles at random and apply a cap to each by hand, using an amount of torque estimated to be correct for the case at hand or as indicated by the table on the following page. (In applying caps, bring the torque up smoothly to the predetermined value and hold for approximately one second.) Then determine and record removal torque for each of the 10 bottles. By comparing figures obtained in this method with removal torque of packages from the line, it's possible to determine whether the capping machine is applying caps at the required tightness.

Example: 10 duplicate bottles with 20-400 finish capped by hand using plastic closures and 10 inch pounds torque gave removal torque values varying between 4 and 5 inch pounds. The same bottles closed with duplicate caps using 15 inch pounds torque gave removal torques varying from 5 to 7 inch pounds. If you need tightness equivalent to 10 to 15 inch pounds hand application, the capping machine should be adjusted to give removal torques of 4 to 7 pounds. This procedure can also be measured in Newton meters since these torque testers are calibrated in both inch pounds and Newton meters.

Since tightness obtained is a function not only of torque applied, but also of other factors such as head pressure and the time cycle, figures obtained by the above process may not correspond to the exact amount of torque actually applied by the capping machine.

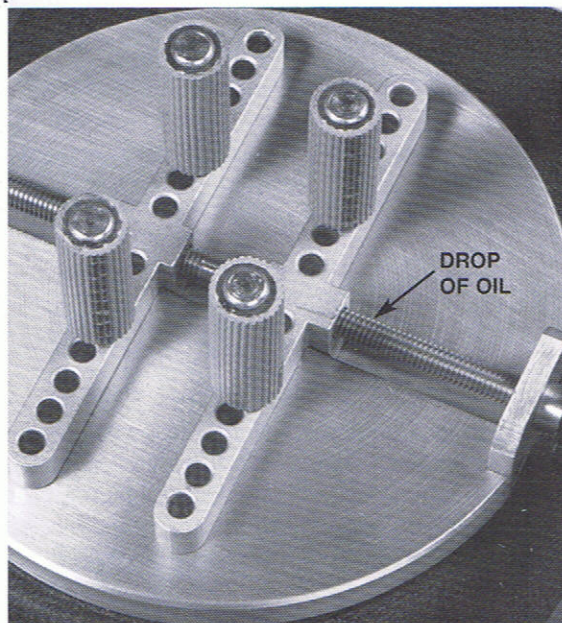
In some instances (e.g. when packaging substances such as cough syrup), empty bottles should be tested since some substances on the bottle finish will result in erratic figures which do not accurately record performance of the capping machine.

CAUTION: Where removal torque is used as a measure of tightness of application, the figure should be obtained within a few minutes of the time the cap is applied. If packages are allowed to stand for any considerable time, removal torque may change markedly. Since removal torque is affected by time and other factors, suggested tightness is not expressed directly in units of removal torque.

The following tabulation shows suggested tightness for pulp lined metal and thermosetting closures in terms of torque as applied by hand. Lug caps, linerless polypropylene caps and polystyrene caps require special considerations. Contact your closure supplier for guidance.

Closure size in millimeters	Suggested tightness of application in units of inch pounds torque as applied by hand.
15	6-9
18	7-11
20	8-12
22	9-13
24	10-15
28	11-17
33	13-20
38	15-23
43	17-26
48	19-29
53	21-32
58	23-35
63	25-38
70	28-42
83	34-49
86	35-51
89	36-53
100	40-60
110	45-65
120	48-72
132	53-79

The preceding figures are entirely empirical and constitute a general guide rather than definite recommendations to fit specific circumstances. In a few cases, it may not be found practical to work within the limits given and experience may show in these cases that it is unnecessary.



The closure on your container must be placed over the center of the table on your unit for proper testing.

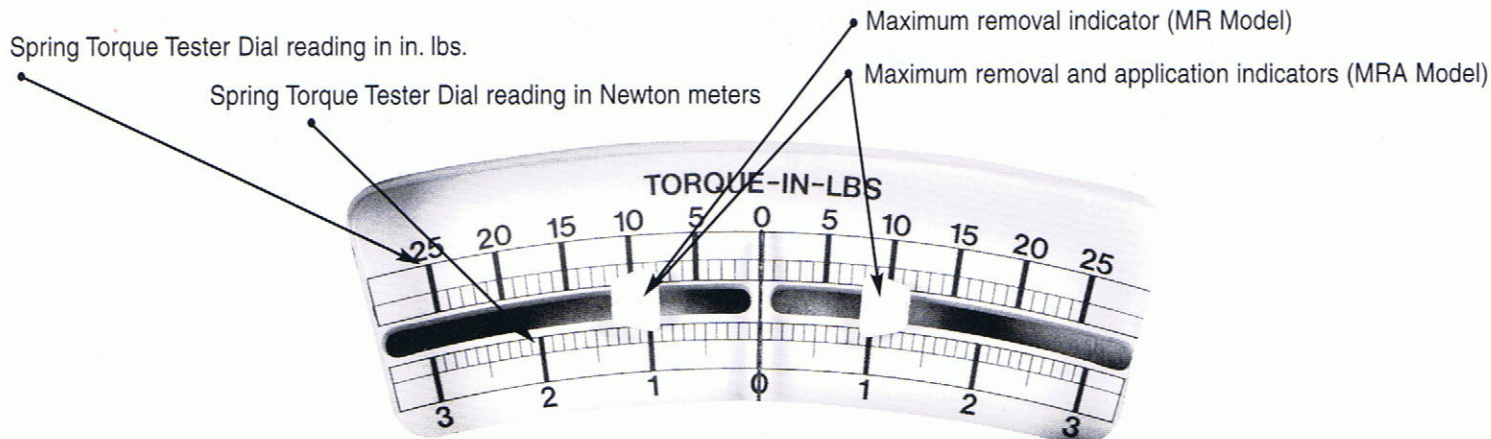
If centering of closure on the table cannot be obtained by adjusting the bumpers and pins, special brackets, or fixtures are available from Secure Pak.

Care of the Instrument

The spring torque tester is ruggedly built and should give long service without maintenance or repair. None of the enclosed parts require oiling. An occasional drop of oil on the screw thread of the chuck will keep it operating smoothly.

The instrument has been carefully calibrated and tested before shipment. Special equipment is required for calibration and only in unusual circumstances should adjustments be required.

If there is any doubt as to whether the instrument is working properly, we recommend that you contact Secure Pak™ at 419-893-9965 or via email at securepak@glassline.com.



Spring Torque Tester—Parts List

