



**CORMACK
PACKAGING**
A TRICORBRAUN® COMPANY

TECHNICAL TIPS

FOIL INDUCTION SEALING TRAINING

INDUCTION SEALING IS AN INCREDIBLY GOOD REPEATABLE PROCESS PROVIDING YOU DO THE HOMEWORK TO SET THE RUNNING PARAMETERS. THIS IS A BASIC OVERVIEW WHEN YOU ARE SETTING UP TO RUN A NEW INDUCTION SEAL.

The variables before you start running on your line will be as follows:

BOTTLE What material is the bottle made from? Commonly the liner suppliers will have one grade specifically for HDPE bottles and a different grade (with a different facing layer) designed for PET bottles. Recently there have been advances that can allow us to supply you a Universal grade. This will work on both bottle materials but is 10 to 15% dearer. It certainly helps if you use the same closure over 2 very different bottle materials as you only need to have the one grade material of lined caps. The only down side is that generally these Universal grades have a much narrower operating window so you need to be more accurate in your line settings to run them.

Liner tabs There are a number of alternatives to help the consumer open the induction seal easier. Common ones are both tri tab (3 small pull tabs) and the single reverse folded long pull tab. Care needs to be taken when setting up to run these as the non-round outer circumference or double up of liner with the pull tab will affect the inductive seal and cause a slightly lower bond at the point of the tabs. The other option is the Lift and Peel style materials but these are generally 20% dearer and often there is both a very large MOQ and longer lead-times to use these.

SECONDARY SEAL In many applications customers need a secondary seal for repeated use after the foil seal has been removed. It is important that this secondary seal (often foamed polyethylene) is not going to affect or bond to the induction seal due to the induction heat.

RE-TORQUERS These are generally only used by high end Pharmaceutical packers for packs with a child resistant push turn cap. It re torques the closure after the induction tunnel to ensure the cap remains tight enough for the CR function to continue to operate.

We then move to the variables on the production line. These are the speed of the conveyor that determines the speed of the bottle under the induction machine, the application torque the cap



has been applied to the bottle and the induction setting on the machine. It is important that you don't have bottles stopping under the induction head at any time. Before you start make sure the induction head is set as per the manufacturers recommendation in terms of clearance above the closure and that the induction head is level in both directions (Across the line of the conveyor and along the line of the conveyor).

From this point we need to set 2 variables and not alter them. The conveyor speed and the application torque to the bottle. You need to record the conveyor speed and the application torque. It is important to measure the caps removal torque 2 hours after application. Then you should torque about 100 packs, set the induction seal strength to say 60%, and start to pass 10 bottles through the line. Do not open them yet. Increase the induction machine to 70% and pass through another 10 bottles. Do the same for 10 bottles at 80% and 90%. Obviously mark all the bottles before you put them through at 60, 70 etc so you know what the setting they went through the induction head. Wait 20 mins for all the packs to cool, then starting at the 60% level, open 5 packs. You should open them on the torque tester and record the opening torques then inspect the seal and then do a light pull test to see what level of seal you have. Progressively do all settings. This should then give you one setting when the induction seal is almost complete around the full seal area (the lower limit LL) and then when you find the setting where the bond is virtually bonded so much it can't be removed (the upper limit UL). Lets say you have the LL at 70 and the UL at 80. You then repeat the exercise at say 2 increments from 72 to 78. This will let you set what you feel is the ideal seal eg 76 induction setting.

As induction seals strengthen for up to 48 hours after application, you should then test packs at 2 hours after sealing, and again at 24 hours after sealing. You may find through this process it is a better 24 hour result at the 74 induction setting. You should also measure the removal torques.

You may find the removal torque is too low (or high) after 24 hours from the induction sealing in which case you can repeat the testing but this time leave the induction setting at the 74% and do a series of 10 bottles each at different application torques.

Whilst this may seem a long process, once recorded for the 3 key settings (eg line speed 120 m/min, on torque 24 Nm, off torque 18 Nm at 2 hours and induction setting 74, you then have a very repeatable process that will provide a good consistent induction seal.

**EXAMPLE
TABLE:**

Bottles 38/400 neck white HDPE		50 ml capacity Dry tablets		
Closures 38 CR3 talc filled lined with 1.0 mm closed sell PE foam				
and FS1-15 Tri Tab HDPE Induction foil				
Date 23/6/21				
Conveyor speed: 120 m/min		On Torque 24 Nm		
Removal torque at 2 hours 20 Nm, 24 hrs 16 Nm				
Induction setting 70				
	70%	80%	90%	84%
Bottle 1	Poor Seal	Good Seal	Hard Seal	Good Seal
Bottle 2	Fair Seal	Good Seal	Hard Seal	Good Seal
Bottle 3	Poor Seal	Good Seal	Hard Seal	Good Seal
Bottle 4	Poor Seal	Fair Seal	Hard Seal	Good Seal
Bottle 5	Poor Seal	Good Seal	Good Seal	Good Seal