

Established in the year 1969 IEEC has always been known for its latest innovations and reliable technologies. IEEC made its first Corona Treater in the year 1973, and since then it has always put efforts for developing new and improved Surface Treatment Equipments for its esteemed customers.

IEEC has always tried to cope with the emerging trends in the field of Flexible packaging and converting.

IEEC'S LATEST INNOVATION "OZOGEN-500"

At this modern Era of Packaging there is a huge demand of high quality laminates. The manufacturers of these advanced packages who are using extrusion coating process must get good bond strengths between their laminates.

The treatment process has never been discussed as intensively in the past as it is been in discussion today. Corona Treatment as we all know plays an extremely important role when it comes to Lamination whether it may be solvent less or Solvent based or Extrusion Coating lamination Process.

With consistent Research & Development and valuable customer Feedback IEEC has "OZOGEN-500" which is now proving itself as an efficient Technology in Extrusion Coating Process.

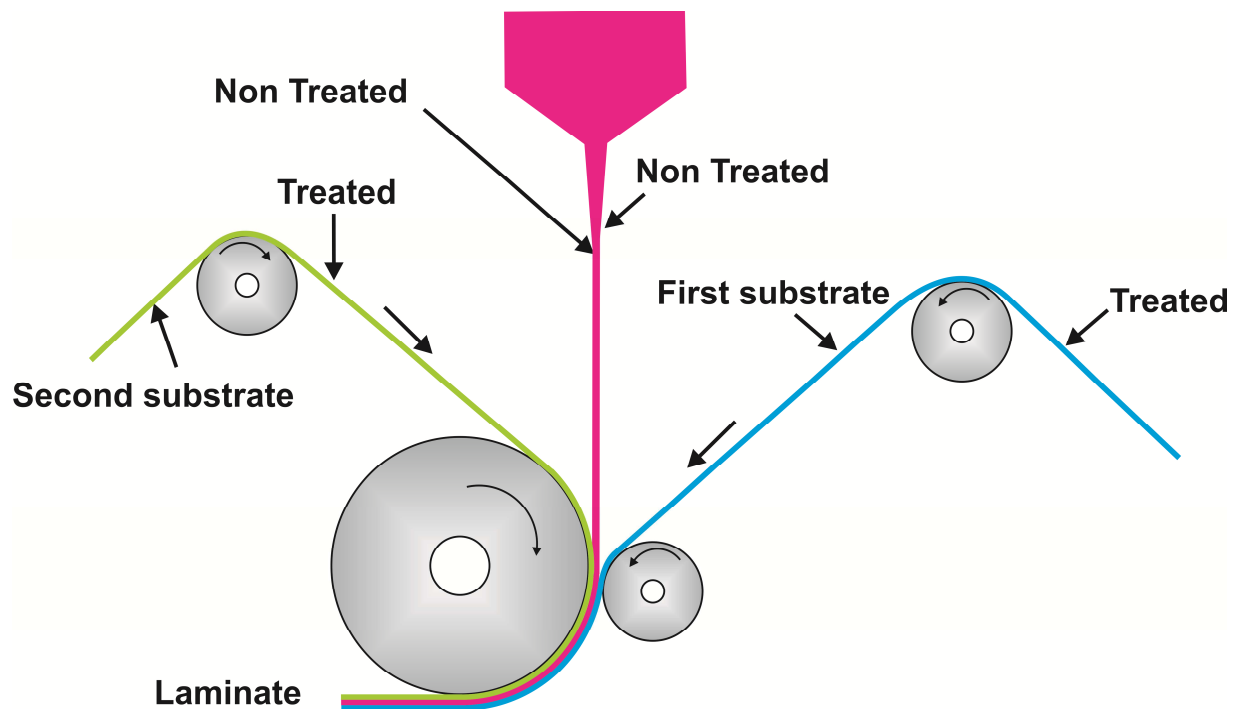
Widely there are three main Treatment technologies in extrusion Coating Process.

1. Corona Treatment
2. Ozone Treatment
3. Flame Treatment

We are well aware about Corona and Flame Treatment but we know very little about the benefits of doing Ozone Treatment. Extrusion coating itself is a very complex process and has a lot of limitations when it comes to Modern Era packaging. We have to compromise line speeds in order to achieve good bond strength, avoid odour and off taste.

Ozone can play an important role to eliminate these problems, and give efficient bond strengths at high line speeds.

Now let us examine Extrusion Coating process in brief.



As it is clear in the above diagram that during Extrusion Coating we can do Corona Treatment on the first and second substrate but we cannot do Corona Treatment on the Hot Melt Poly.

Consequences??

Clearly as the treatment is only at one surface the bond strength will not be as good as it would have been if the treatment would be on both surfaces.

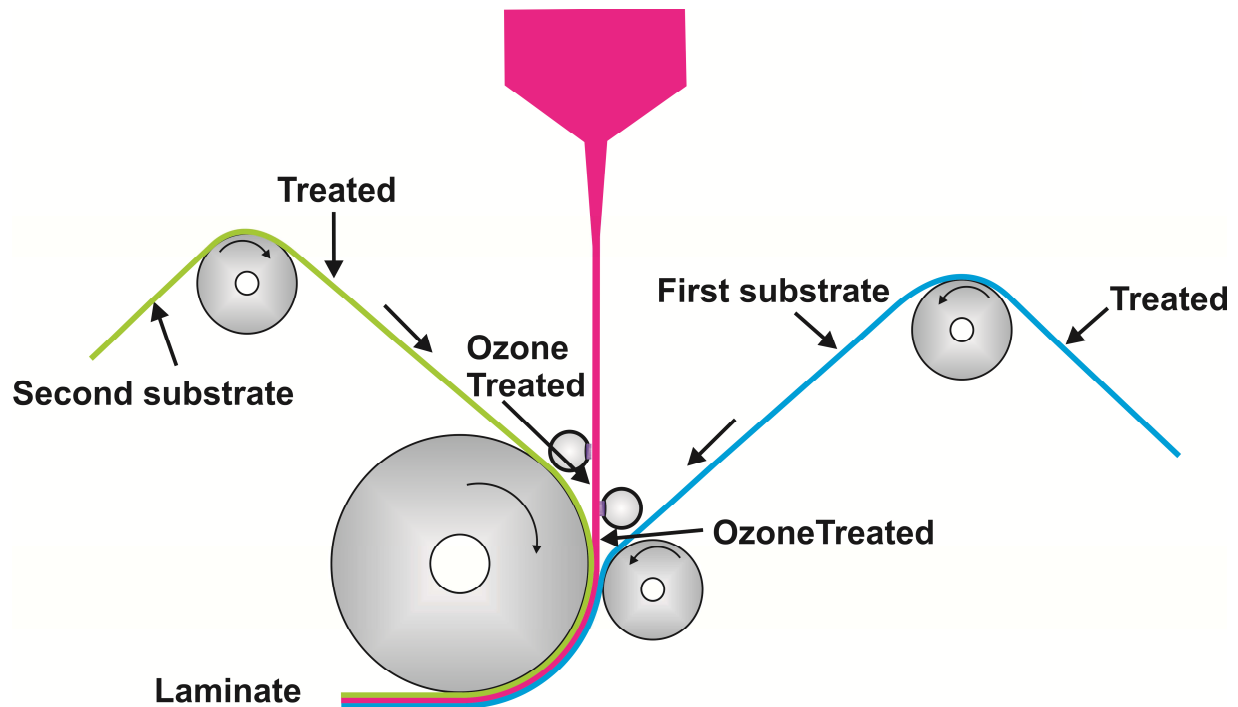
What to Do??

To achieve optimum bond Strength we have to Treat Hot Mel Poly also.

How to Do??

This can be done by Using IEEC's "OZOGEN-500" Ozone Treatment System, which can treat the Hot melt Poly by applying Ozone at a particular point.

The below diagram will elaborate how the OZOGEN-500 will treat the hot melt poly Coming out of the T-Die from extruder.



Fringe Benefits of Ozone Treatment.

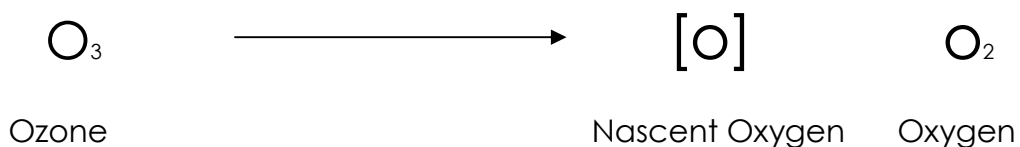
Ozone Treatment, not only increases Surface Tension(Dyne/cm) of the Hot Melt Poly coming out of extruder but also has following benefits.

- Reduce Melt Temperatures.
- Reduce Odour and Off Taste.
- Increase Line Speeds.
- Eliminate Use of Primers.
- Improve Heat Seal ability.

Why Ozone??

The use of Ozone helps to achieve good bond strength without any high temperature oxidation Problem. Ozone is produced under strictly controlled conditions and is exposed to the hot melt poly deep in the nip area at the contacting surface.

As ozone decomposes to Oxygen molecule and nascent oxygen, it acts as a strong oxidizing agent.



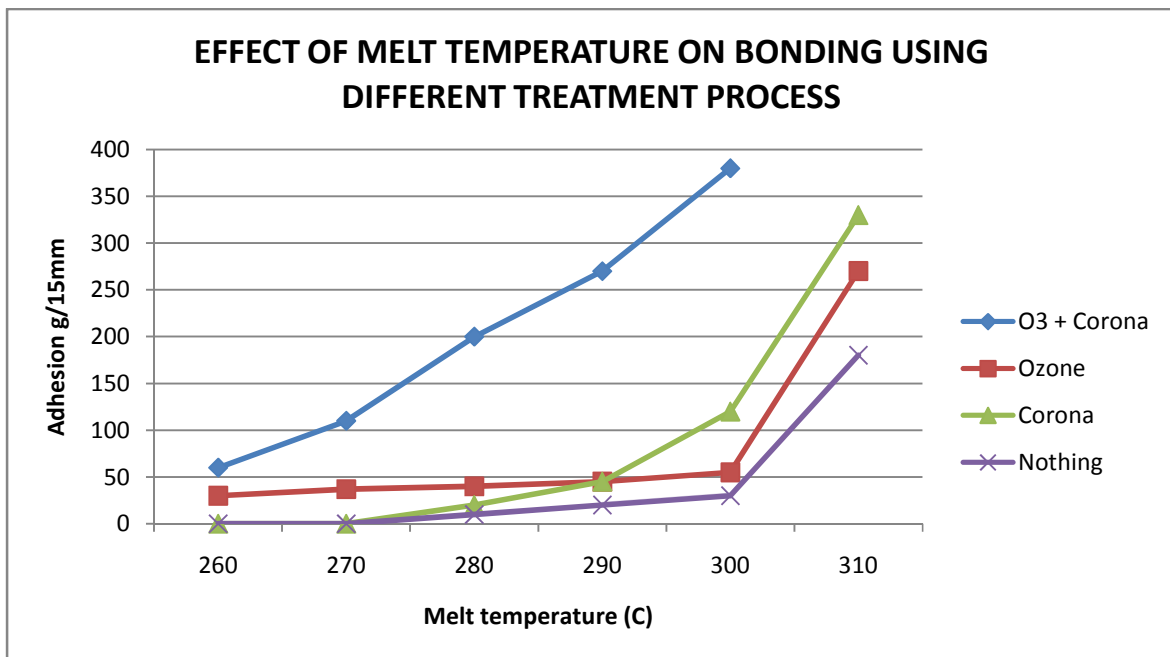
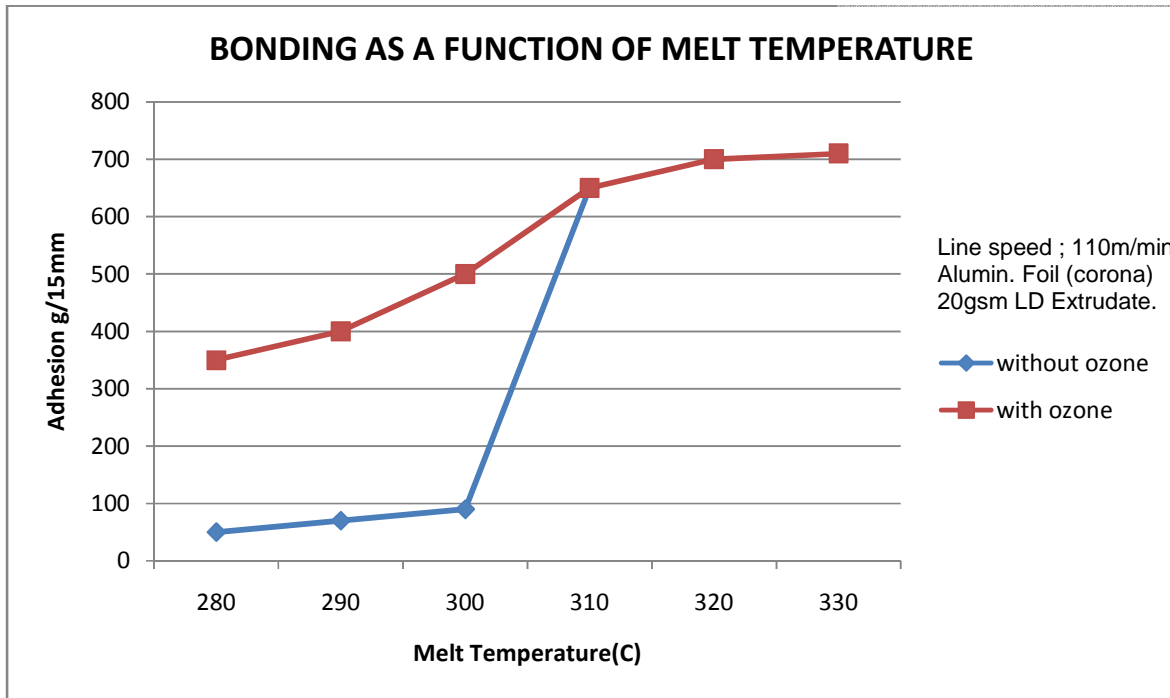
Nascent oxygen will accelerate melt oxidation as it has a shorter reaction initiation time.

We have been talking about melt temperatures in this article. Now let us examine what is melt temperatures and what are its affects in Lamination process and speed.

Melt Temperature

Melt temperature is a property which determines initiation time, reaction rate and reaction time. The research and analysis show that at constant line speeds Adhesion is not linearly proportional to temperature but dramatically drops below a critical temperature.

The temperature depends on the dwell time of melt in the laminator air gap.

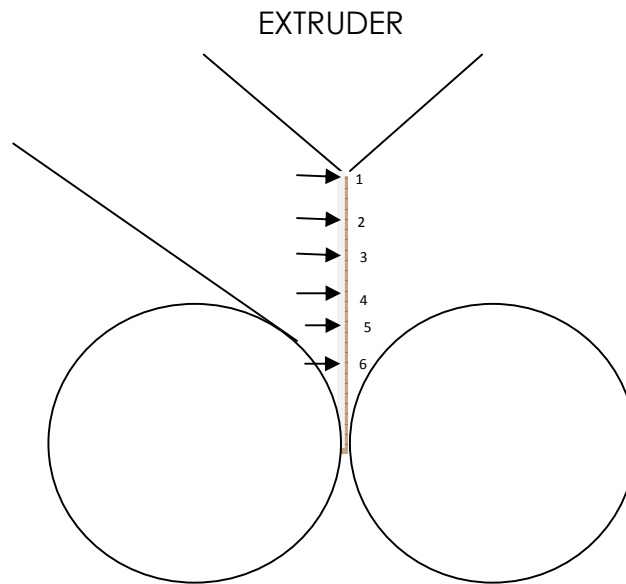


The research and experiments also show that if the ozone is applied near the nip at a distance of 4 cm from the hot melt poly. The adhesion achieved is maximum.

During Test following things were constant

1. Speed: 160m/min
2. Melt Temperature: 300°C
3. Coating weight 20g/sqm

The below diagram will elaborate it.



The results obtained are as under.

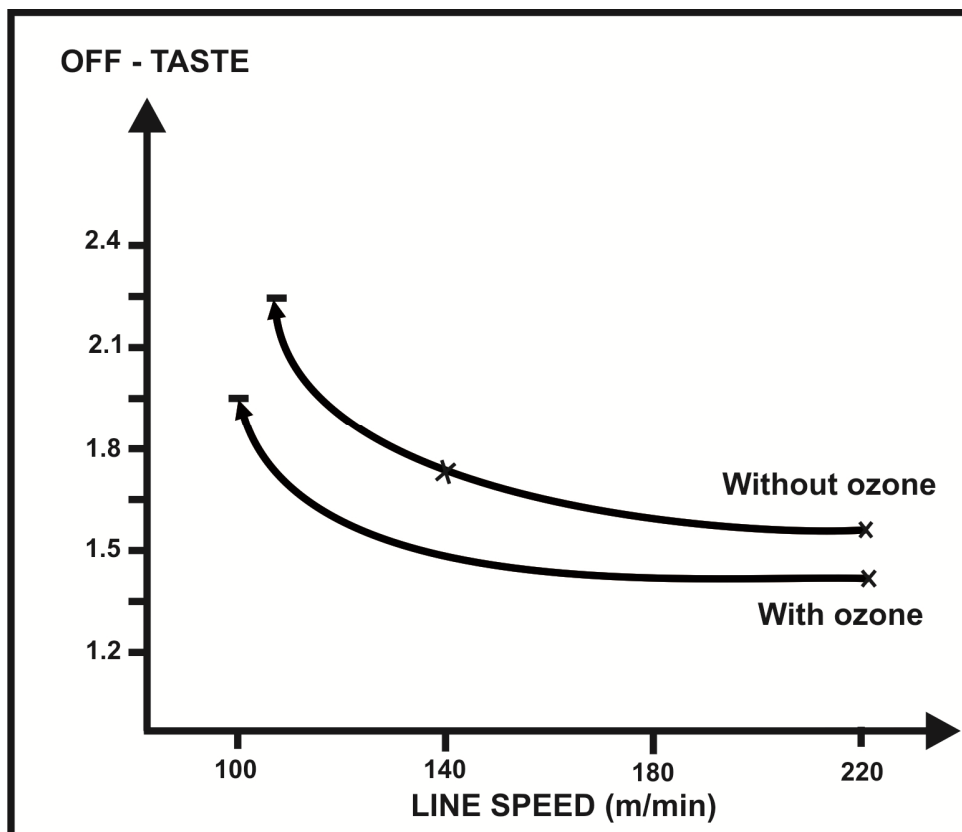
POSITION	PERCENTAGE BONDING
1	60%
2	63%
3	61%
4	80%
5	99%
6	96%

OZONE REDUCES OFF-TASTE

The experiments have proven that the ozone helps in reducing the levels of off-Taste. As we know that the Excessive melt- Oxidation degrades the polymer,

which eventually results in the odour or off-taste. This is a serious issue when the end product is to be used for food packaging.

The graph below shows that equal bonding levels can be achieved irrespective of line speed, with the application of Ozone to achieve oxidation, off-taste/odour will be significantly reduced.



Thus we can say that with emerging trends of packaging and improved demand of high quality product we have to adopt these technologies so that we may achieve better quality at high line speeds.