



Testing of Keep-It-Fresh bags for Flowers

# ETHYLENE PROBLEM



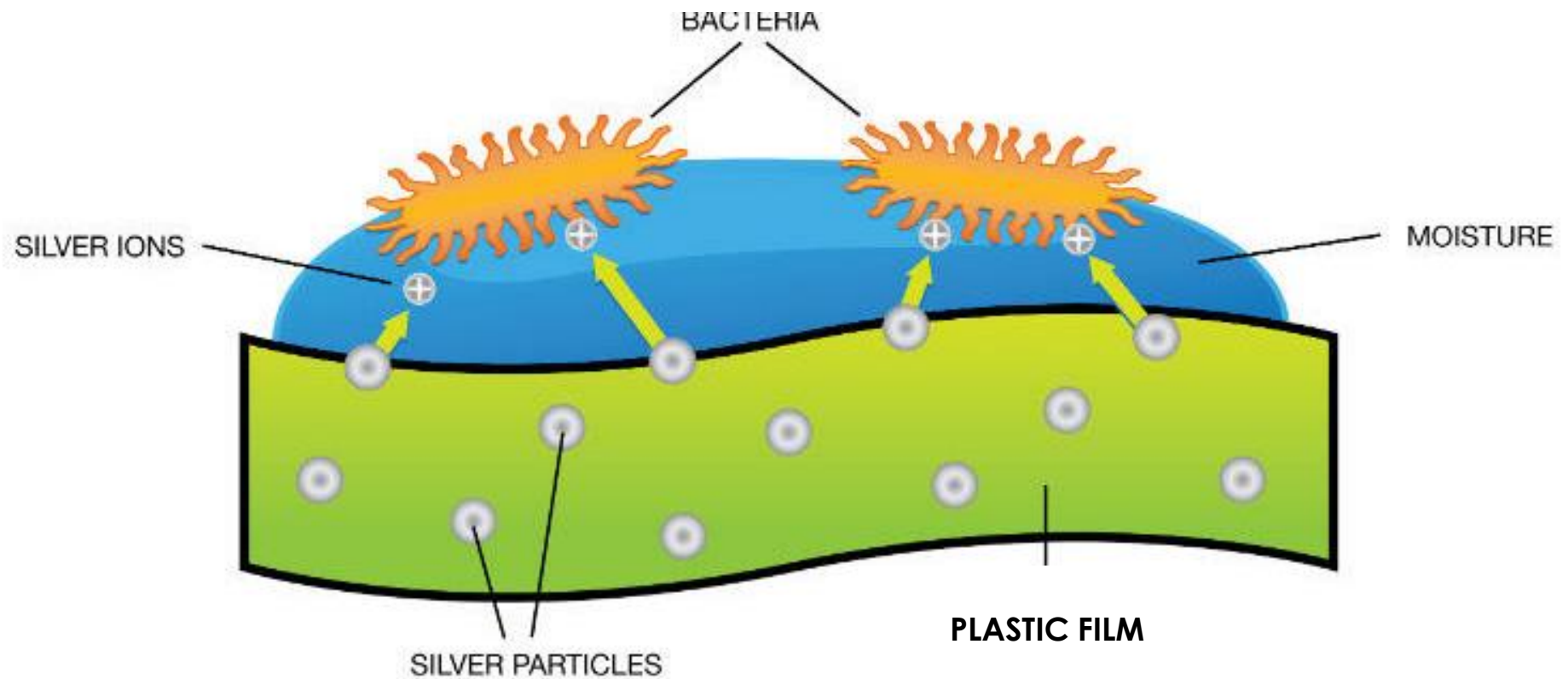
- ▶ Ethylene is a gas naturally produced by fruits and flowers as it ripens
- ▶ Ethylene works as an accelerator to the ripening process
- ▶ Ethylene increases ripening exponentially
- ▶ Ethylene adsorbers reduce the ripening rate by adsorbing the ethylene molecules.
- ▶ Ethylene molecules form a bond with the keep-it-fresh additives and are trapped



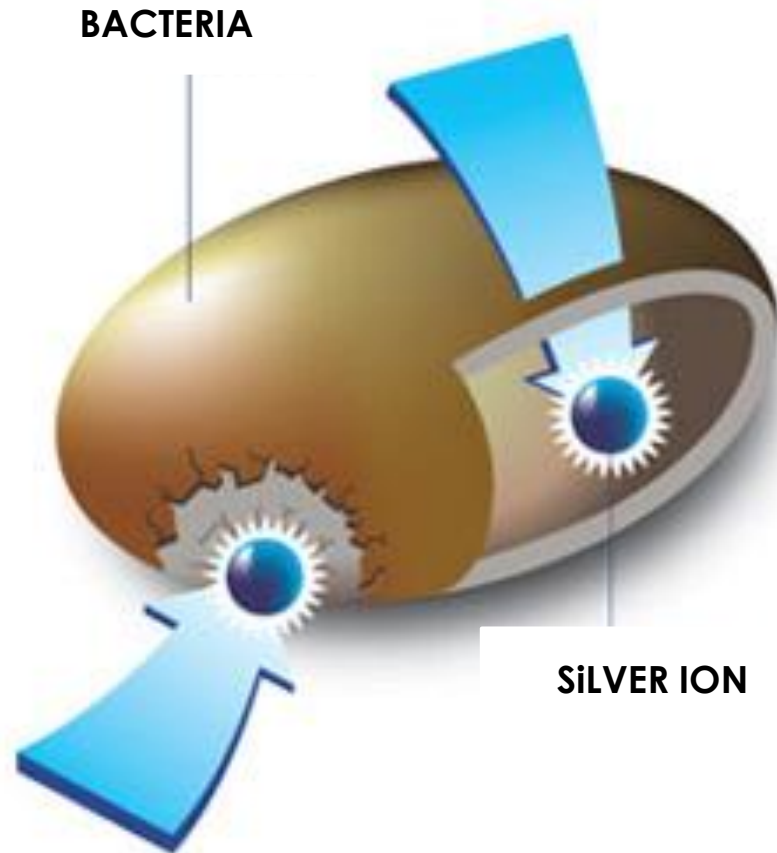
Technology

**Anti-Microbial  
&  
Ethylene Adsorbers**

# Anti Microbials



# How Silver Ions Work?



1. Cell Membrane is de-stabilized
2. Respiration is prohibited
3. Food nutrition intake is impeded
4. Cell Division is inhibited

# ETHYLENE PROBLEM



## ETHYLENE PRODUCTION FROM DIFFERENT FRUITS & VEGETABLES

LOW <1.0 ml/kg/hr	MODERATE 1-10 ml/kg/hr	HIGH 10-100 ml/kg/hr	VERY HIGH >100 ml/kg/hr
Pineapple, artichoke, cauliflower, broccoli, date, orange, spinach, beet root, green asparagus, celery, lemon	Banana, mango, plum, tomato	Apricot, nectarine, pear, peach	Apple, Avocado, cherimoya, passion fruit



# Keep It Fresh Bags



- ▶ Made from food grade Polyethylene resins.
- ▶ Leave no harmful residues and are human safe.
- ▶ Preserve the freshness of perishables at room temperature as well as in refrigerator
- ▶ Certified and approved for food contact applications
- ▶ USFDA Tested by SGS Labs
- ▶ Recyclable



# USFDA Testing from SGS

Passes USFDA 21 CFR177.1520 (Olefin Polymers)



SGS

## TEST REPORT

Report No. : MAN:HL:7480003070

DATE : 18<sup>th</sup> February, 2016

HI TECH INTERNATIONAL  
PLOT NO-B 31,, BEANT COLONY JAMALPUR  
LUDHIANA-141010  
INDIA

CONTACT PERSON : MR. SIDHARTH SAREEN

THE FOLLOWING SAMPLE(S) WAS/WERE SUBMITTED AND IDENTIFIED BY/ON BEHALF OF THE CUSTOMER AS :

SAMPLE DESCRIPTION ROT NOT BAG  
COLOUR GREEN  
BUYER HI TECH INTERNATIONAL  
COUNTRY OF ORIGIN INDIA  
SAMPLE RECD ON 08/02/2016  
TEST PERFORMING DATE 09/02/2016 TO 18/02/2016

TEST REQUESTED PLS. REFER TO SUMMARY

TEST METHOD & RESULT(S) PLEASE REFER TO NEXT PAGE(S)

### SUMMARY OF TEST RESULTS:

TEST REQUESTED	CONCLUSION
US FDA 21 CFR 177.1520 (Olefin Polymers) Maximum Extractable fraction Maximum Soluble fraction	Pass

Per Pro SGS India Pvt Ltd.

Ashish  
Sr. Executive  
Email your Test Report Related Enquiries at Feedback.HLT@sgs.com

SGS

## TEST REPORT

Report No. : MAN:HL:7480003069

DATE : 17<sup>th</sup> February, 2016

HI TECH INTERNATIONAL  
PLOT NO-B 31,, BEANT COLONY JAMALPUR  
LUDHIANA-141010  
INDIA  
CONTACT PERSON : MR. SIDHARTH SAREEN

THE FOLLOWING SAMPLE(S) WAS/WERE SUBMITTED AND IDENTIFIED BY/ON BEHALF OF THE CUSTOMER AS :

SAMPLE DESCRIPTION ROT NOT MASTERBATCH 3131  
COLOUR WHITE GRANULES  
BUYER HI TECH INTERNATIONAL  
COUNTRY OF DESTINATION NOT PROVIDED  
COUNTRY OF ORIGIN INDIA  
SAMPLE RECD ON 08/02/2016  
TEST PERFORMING DATE 09/02/2016 TO 17/02/2016

TEST REQUESTED PLS. REFER TO SUMMARY

TEST METHOD & RESULT(S) PLEASE REFER TO NEXT PAGE(S)

### SUMMARY OF TEST RESULTS:

TEST REQUESTED	CONCLUSION
US FDA 21 CFR 177.1520 (Olefin Polymers) Maximum Extractable fraction Maximum Soluble fraction	Pass

Per Pro SGS India Pvt Ltd.

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# TESTING on Flowers



# Day 1



Flower in Normal Bag



Flower in Keep It Fresh Bag



# Day 3



Flower in Normal Bag



Flower in Keep-It-Fresh Bag





Day 7



Flower in Normal Bag



Flower in Keep-It-Fresh Bag



Day 7 – Normal bag



# Day 7 – Keep-It-Fresh Bag





# Results



- ▶ Flowers kept in Keep-It-fresh bags last longer than the normal bags
- ▶ The flower in keep-it-fresh bag maintained its freshness after 2 days compared to the one in normal bag which began to lose its petals
- ▶ The flower in Normal bag dried and developed fungal growth after 7 days where as the one in keep-it-fresh bag looked much better.
- ▶ The Keep-It-Fresh bags undoubtedly extend the shelf life of fresh flowers as seen in the test.

# Also available Keep-It-Fresh Capsules



- ▶ Plastic Capsules for 10 cubic feet
- ▶ Can be placed in refrigerators and with fresh produce
- ▶ Also available with adhesive backing



# Thanks!

SHELF LIFE EXTENSION FROM KEEP-IT-FRESH