



# Test Report

No. F690101/LF-CTSAYAA16-43806

Issued Date: 2016. 08. 12

Page 1 of 7

## HANWHA L&C CORPORATION

37, Buganggeumho-ro, Bugang-myeon  
Sejong-si  
Korea

The following sample(s) was/were submitted and identified by/on behalf of the client as:-

**SGS File No.** : AYAA16-43806  
**Product Name** : PVC SHRINK FILM  
**Item No./Part No.** : N/A  
**Received Date** : 2016. 07. 29  
**Test Period** : 2016. 07. 29 to 2016. 08. 12  
**Test Result(s)** : For further details, please refer to following page (s)

### Result Summary

| Test Requested  | Conclusion  |
|---|-------------|
| <b>1. Commission Regulation (EU) No 10/2011 and hence Article 3 of European Regulation No. 1935/2004.</b> | -           |
| a) Plastic – Overall Migration  | <b>PASS</b> |
| b) Plastic – Specific Migration of Heavy Metals   | <b>PASS</b> |
| c) PVC- Specific Migration of Phthalates  | <b>PASS</b> |
| d) PVC – Residual vinyl chloride monomer  | <b>PASS</b> |
| <b>2. German Food, Articles of Daily Use and Feed Code of September 1, 2005(LFGB), Section 31</b>         | -           |
| a) Sensorial examination odour and taste test   | <b>PASS</b> |

SGS Korea Co., Ltd.

Jeff Jang / Chemical Lab manager

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at [www.sgs.com/terms\\_e-document.htm](http://www.sgs.com/terms_e-document.htm). Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).



# Test Report

No. F690101/LF-CTSAYAA16-43806

Issued Date: 2016. 08. 12

Page 2 of 7

Sample No. : AYAA16-43806.001

Sample Description : PVC SHRINK FILM

Item / Part No. : N/A

Material : PVC

## Test result(s) :

### 1. European Commission Regulation (EU) No 10/2011

#### a) Plastic – Overall migration

Method: With reference to EN 1186-1:2002 for selection of conditions and test methods;

EN 1186-5:2002 aqueous food simulants by cell method;

EN 1186-4:2002 olive oil by cell method;

EN 1186-14:2002 Substitute test

| Simulant Used                        | Test Condition  | Result (mg/dm <sup>2</sup> ) | Detection Limit (mg/dm <sup>2</sup> ) | Permissible (mg/dm <sup>2</sup> ) |
|--------------------------------------|-----------------|------------------------------|---------------------------------------|-----------------------------------|
| 3% Acetic Acid(W/V) Aqueous Solution | 70 °C for 2 hrs | N.D                          | 3.0                                   | 10                                |
| 20% Ethanol(V/V) Aqueous Solution    | 70 °C for 2 hrs | N.D                          | 3.0                                   | 10                                |
| Olive oil                            | 70 °C for 2 hrs | N.D                          | 3.0                                   | 10                                |
| <b>Comment</b>                       | --              | <b>PASS</b>                  | --                                    | --                                |

Note : 1. mg/dm<sup>2</sup> = milligram per square decimeter

2. °C = degree Celsius

3. N.D = Not Detected

4. Permissible Limit is according to Commission Regulation (EU) No 10/2011 of January 2011 with amendments.

#### Remark:

1. Analytical tolerance of aqueous simulants is 1mg/dm<sup>2</sup> or 6mg/kg
2. Analytical tolerance of fatty food simulants is 3mg/dm<sup>2</sup> or 20mg/kg
3. Test condition & simulant were specified by client.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at [www.sgs.com/terms\\_e-document.htm](http://www.sgs.com/terms_e-document.htm). Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).



# Test Report

No. F690101/LF-CTSAYAA16-43806

Issued Date: 2016. 08. 12

Page 3 of 7

**Sample No.** : AYAA16-43806.001  
**Sample Description** : PVC SHRINK FILM  
**Item / Part No.** : N/A  
**Material** : PVC

## b) Plastic – Specific migration of Heavy metals

Method: With reference to EN 13130-1:2004. Analysis was performed by ICP-MS / ICP-OES.

Simulant Used: 3 % acetic acid (w/v) in aqueous solution

Test Condition: 40 °C for 0.5 hrs

| Test Item                       | Result (mg/kg) | Reporting Limit (mg/kg) | Permissible (mg/kg) |
|---------------------------------|----------------|-------------------------|---------------------|
| Specific Migration of Barium    | N.D            | 0.3                     | 1                   |
| Specific Migration of Cobalt    | N.D            | 0.01                    | 0.05                |
| Specific Migration of Copper    | N.D            | 0.3                     | 5                   |
| Specific Migration of Iron      | N.D            | 0.3                     | 48                  |
| Specific Migration of Lithium   | N.D            | 0.5                     | 0.6                 |
| Specific Migration of Manganese | N.D            | 0.3                     | 0.6                 |
| Specific Migration of Zinc      | N.D            | 0.5                     | 25                  |
| <b>Comment</b>                  | <b>PASS</b>    | --                      | --                  |

Note : 1. mg/kg = milligram per kilogram of foodstuff in contact with

2. °C = degree Celsius

3.N.D -= Not Detected.

4.Permissible Limit is according to Commission Regulation (EU) No 10/2011 of January 2011 with amendments.

Remark : 1. Test condition & simulant were specified by client

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at [www.sgs.com/terms\\_e-document.htm](http://www.sgs.com/terms_e-document.htm). Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).



# Test Report

No. F690101/LF-CTSAYAA16-43806

Issued Date: 2016. 08. 12

Page 4 of 7

Sample No. : AYAA16-43806.001

Sample Description : PVC SHRINK FILM

Item / Part No. : N/A

Material : PVC

## c) PVC - Specific Migration of Phthalates

Method: With reference to BS EN 13130-1 : 2004. Analysis was performed by GC/MS

Simulant Used: 95% Ethanol(V/V) Aqueous Solution

Test Condition: 40 °C for 0.5 hrs

| Test items                          | Result (mg/kg) | Detection Limit (mg/kg) | Permissible Limit(mg/kg) |
|-------------------------------------|----------------|-------------------------|--------------------------|
| Dibutyl phthalate (DBP)             | N.D            | 0.05                    | 0.3                      |
| Benzylbutyl phthalate (BBP)         | N.D            | 0.05                    | 30                       |
| Bis-(2-ethylhexyl) phthalate (DEHP) | N.D            | 0.05                    | 1.5                      |
| Diisononyl phthalate (DINP)         | N.D            | 0.2                     | 9                        |
| Diiodecyl phthalate (DIDP)          | N.D            | 0.2                     |                          |
| Diallyl phthalate (DAP)             | N.D            | 0.01                    | 0.01                     |
| <b>Comment</b>                      | <b>PASS</b>    | --                      | --                       |

Note : 1. mg/kg = milligram per kilogram of foodstuff in contact with

2. N.D = Not Detected

3. Permissible limit is with reference to Commission Regulation (EU) 10/2011.

Remark:

1. Test condition & simulant were specified by client.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at [www.sgs.com/terms\\_e-document.htm](http://www.sgs.com/terms_e-document.htm). Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).



# Test Report

No. F690101/LF-CTSAYAA16-43806

Issued Date: 2016. 08. 12

Page 5 of 7

Sample No. : AYAA16-43806.001

Sample Description : PVC SHRINK FILM

Item / Part No. : N/A

Material : PVC

## d) PVC – Residual vinyl chloride monomer

Method: With reference to EN 13130-5:2004. Analysis was performed by GC/MS

Simulant Used: 95% Ethanol(V/V) Aqueous Solution

Test Condition: : 40 °C for 0.5 hrs

| Test Item                      | Result (mg/kg) | Reporting Limit (mg/kg) | Permissible Limit (mg/kg) |
|--------------------------------|----------------|-------------------------|---------------------------|
| Vinyl Chloride Monomer content | N.D            | 0.01                    | 1                         |
| <b>Comment</b>                 | <b>PASS</b>    | --                      | --                        |

Note: 1. mg/kg = milligram per kilogram of foodstuff in contact with

2. °C = degree Celsius

3. N.D = Not Detected

4. Permissible Limit is according to Commission Regulation (EU) No 10/2011 of 14 January 2011 with amendments.

### Remark:

1. Test condition & simulant were specified by client.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at [www.sgs.com/terms\\_e-document.htm](http://www.sgs.com/terms_e-document.htm). Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

F401 Version 2

SGS Korea Co., Ltd.

322, The O valley, 76, LS-ro, Dongan-gu, Anyang-si, Gyeonggi-do, Korea 14117  
t +82 (0)31 4608 000 f +82 (0)31 4608 059 <http://www.sgsgroup.kr>

Member of the SGS Group (Société Générale de Surveillance)

# Test Report

No. F690101/LF-CTSAYAA16-43806

Issued Date: 2016. 08. 12

Page 6 of 7

Sample No. : AYAA16-43806.001  
 Sample Description : PVC SHRINK FILM  
 Item / Part No. : N/A  
 Material : PVC

**2. In accordance with German Food, Articles of Daily Use and Feed Code of September 1, 2005 (LFGB) with its amendment, Section 30 and 31, and article 3 of EU Regulation (EC) No 1935/2004**

a) Sensorial examination of odour and taste

Test Method: With reference to DIN10955: 2004

Migration condition: 70 °C for 2 hrs

Test Simulant: Water

The number of panelists: 6

Test Results :

| Test Simulant  | Test Item                   | Result      | Maximum Permissible Limit |
|----------------|-----------------------------|-------------|---------------------------|
| Water          | Sensorial examination odour | 0.5         | 2.5                       |
|                | Sensorial examination taste | 1.0         | 2.5                       |
| <b>Comment</b> |                             | <b>PASS</b> | <b>--</b>                 |

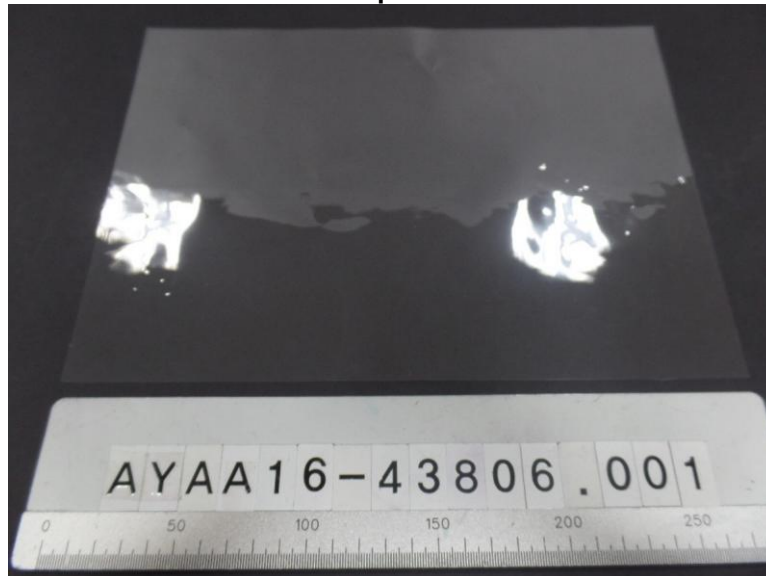
Note : 1. Intensity scale (rounded at 0.5):

- 0 – no perceptible difference
- 1 – just perceptible difference
- 2 – slight difference
- 3 – marked difference
- 4 – strong difference

2. Permissible Limit is according to LFGB with its amendment, Section 30 and 31, and Regulation (EC) No 1935/2004 of The European Parliament and of the Council of 27 October 2004.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at [www.sgs.com/terms\\_e-document.htm](http://www.sgs.com/terms_e-document.htm). Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).

Picture of Samples as Received:



\*\*\* End of Report \*\*\*

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at [www.sgs.com/terms\\_e-document.htm](http://www.sgs.com/terms_e-document.htm). Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s).