

# Nichigo G-Tape Technical Report

## Long Term UV Resistance

### Nichigo G-Tape 3030BK and 3040BK

#### 1. Test Objective

Nichigo G-Tape 3030BK and 3040BK have been used in building construction fields for a long time. It has been confirmed by professional people that 3030BK and 3040BK have high weather resistance including long term sun lights exposure. The objective of this test is to evaluate 3030BK and 3040BK's long term durability against UV. We calculated annual UV irradiation on house wrap through sizing gap and conducted accelerated test by xenon chamber. The tensile strength of tapes and house wrap sheet were measured over time.

#### 2. Test Method

##### 2-1) Condition

We estimated UV exposure period per day on the house wrap surface 2 inch below sizing through 0.8 inch clearance (Fig. 1). Using strength of actual UV irradiation at Miami Florida, annual UV irradiation was estimated,  $47\text{MJ/m}^2$  (300-400nm).

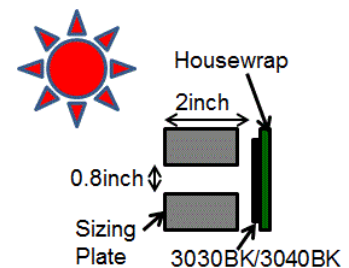


Fig.1 Estimated image of UV irradiation on house wrap through sizing gap

##### 2-2) Xenon chamber test condition

Test unit : Iwasaki XER-W75

Xenon energy :  $180\text{W/m}^2$  (@300-400nm)

Test condition : 145 degree F at 50%RH (No shower)

$$47 \times 1000000 \text{W} \cdot \text{s/m}^2 \div 180 \text{W/m}^2 \doteq 260000 \text{s} \doteq 3 \text{day}$$

⇒ 3days xenon lights exposure is equivalent to 1year sun lights exposure at Miami.

#### 3. UV Transmittance

UV transmittance of 3030BK and 3040BK is almost zero. (High UV resistance)

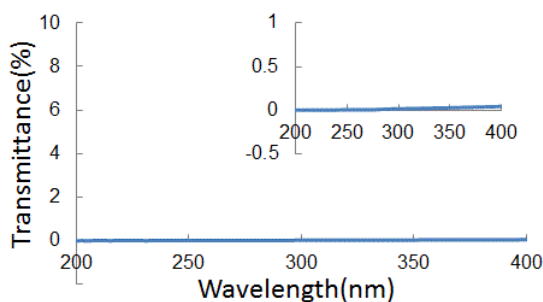


Fig.2 UV transmittance of 3030BK

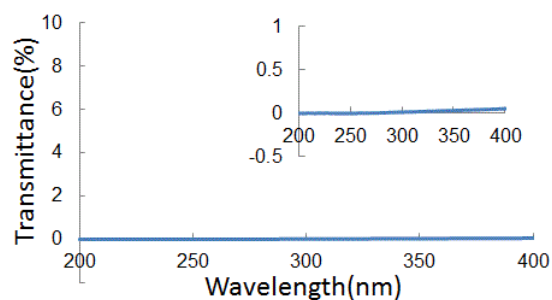


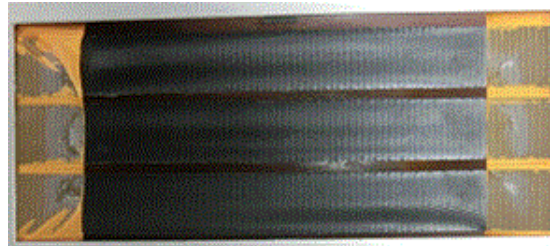
Fig.2 UV transmittance of 3040BK

#### 4. Tensile Strength Loss of Tapes

Tensile strength loss of 3030BK and 3040BK was small even after 45days xenon lights exposure that is equivalent to 15years sun lights exposure at Miami.

Chart.1 Tensile strength change of tapes

<b>Tensile strength of tapes (lb/in)</b>					
<b>Xenon (180W/m<sup>2</sup>)</b>	Initial	9days	15days	24days	45days
<b>Equivalent year</b>	0	3years	5years	8years	15years
<b>3030BK/3040BK</b>	43	42	40	33	32

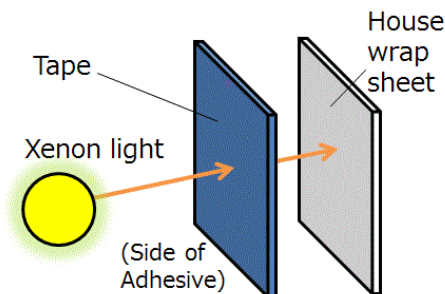


No visible changes on tape samples

Fig.4 Test pieces of 3030BK/3040BK after 45days xenon lights exposure

#### 5. Tensile Strength Loss of House Wrap Sheet

We evaluated tensile strength loss of four spun bonded polyolefin sheets (house wrap sheet 1~4). Tensile strength loss of four house wrap sheets protected by tape were much smaller than that without tape even after 60days xenon lights exposure that is equivalent to 20years sun lights exposure at Miami.



F1ig.5 Estimated image of UV irradiation on house wrap sheet through tape

Chart.2 Tensile strength change of four house wrap sheets

		<b>Tensile strength of house wrap sheet (lb/in)</b>			
<b>Xenon (180W/m<sup>2</sup>)</b>		Initial	18days	45days	60days
<b>Equivalent year</b>		0	6years	15years	20years
<b>House wrap sheet 1</b>	<b>3030BK/3040BK</b>	37	35	27	23
	<b>No Tape</b>		35	20	18
<b>House wrap sheet 2</b>	<b>3030BK/3040BK</b>	23	25	21	21
	<b>No Tape</b>		17	7.5	5.3
<b>House wrap sheet 3</b>	<b>3030BK/3040BK</b>	11	8.5	8.3	7.6
	<b>No Tape</b>		1.0	0	0
<b>House wrap sheet 4</b>	<b>3030BK/3040BK</b>	12	11	10	10
	<b>No Tape</b>		8.9	0	0

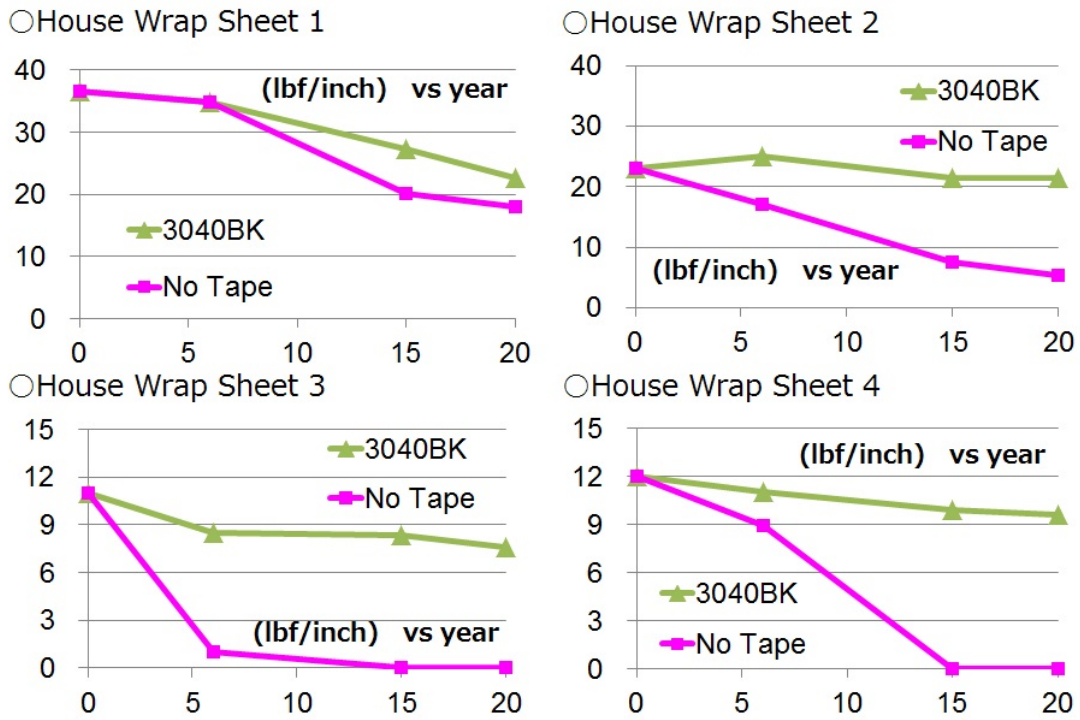
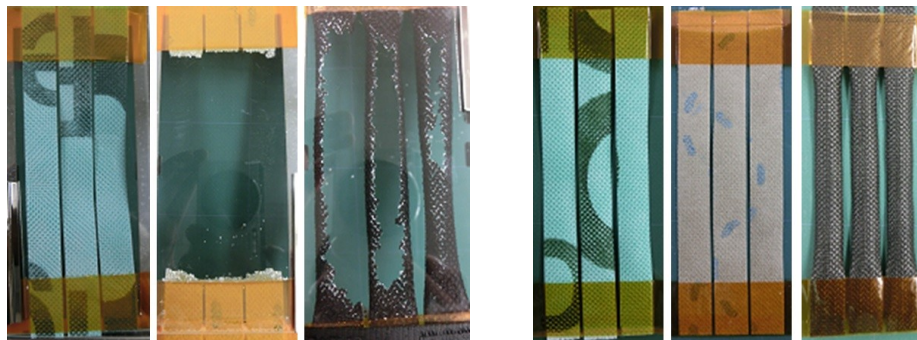


Fig.6 Tensile strength of four house wrap sheets (with & without tape)



Without tape, some house wrap sheets were destroyed by UV

All house wrap sheets were protected from UV by tape

Fig.7 Test pieces of house wrap sheets after 45days xenon lights exposure (Left : Without tape)

## 6. Observation

UV exposure lowers tensile strength over time. However, tensile strength losses of tapes and house wrap sheet were small even after 45days xenon lights exposure that is equivalent to 15years sun lights exposure at Miami. Both tapes are built with a HDPE cloth laminated with carbon composite LDPE. The black layer lowers UV transmittance. It was concluded that 3030BK and 3040BK can be used as a house seaming tape with high UV resistance.

---

## MITSUBISHI CHEMICAL CORPORATION

Environment and Living Solutions Business Domain  
Infrastructure Solutions and Agricultural Materials Division  
Infrastructure Solutions Department  
G-Tape Business Group

**Address:** Mitsubishi Chemical Nihonbashi Building,  
2-2, Nihonbashihongoku-cho 1-chome, Chuo-ku, Tokyo 103-0021, Japan  
**Phone:** +81-(0)3-3279-4110, E-mail: [MCJP-DG-NGC\\_gtape@mchcgr.com](mailto:MCJP-DG-NGC_gtape@mchcgr.com)  
**Website:** <http://www.m-chemical.co.jp>

North & South America  
MITSUBISHI CHEMICAL AMERICA, Inc.  
3930 Ventura Drive Suite 355, Arlington Heights, IL 60004, USA  
**Phone:** +1-224-347-2326, E-mail: [MCA-info@m-chem.com](mailto:MCA-info@m-chem.com)  
**Website:** <http://www.gtape.com>

Europe, Africa & Middle East Asia  
NIPPON GOHSEI Europe GmbH  
Merowingerplatz, 1a, D-40225, Düsseldorf, Germany  
**Phone:** +49-211-385488-221, E-mail: [eurossales@nippon-gohsei.com](mailto:eurossales@nippon-gohsei.com)  
**Website:** <http://www.nippon-gohsei.com>