

[SS 7] printed AND retroreflective and film

Results in EPODOC 35

[SS 8] printed AND retroreflective and film and printed and ink and layer

Results in EPODOC 10

[SS 9] ..li



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PN - [NZ721957](#) A 20180126
PR - US201161548777P 20111019; NZ20120624266 20121019
AP - NZ20120721957 20121019
DT - I
PA - AVERY DENNISON CORP
TI - **Retroreflective** sheeting having a halftone **printed** front surface
AB - A retro-reflective **film** (20) with a planar front surface (5) and a plurality of retro-reflective elements (3) on a back side is disclosed. A halftone **printed ink layer** (20) is deposited on the planar surface (5) formed from discrete dots of deposited **ink** (24). The areas between the dots provide light transmitting openings (26) where light is reflected without interference from the **ink layer** (20). The use of such a halftone pattern of **ink** increases the reflectivity of the reflective sheet by reducing the amount of light absorbed by, or scattered by, the **ink**. Useful in the manufacture of signs, especially road signs. The discrete areas of deposited **ink** of the half-tone pattern cover between about 50% and 99% of the area of the half-tone pattern on the planar surface. Preferably, the discrete areas of deposited **ink** of the half tone pattern covers 60% and 80% of the area of the half-tone pattern on the planar surface. The invention increases the reflectivity of the final **printed retroreflective** sheet material while removing the need for a clear topcoat or **film** and is useful in the manufacture of road signs.

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PN - [RU2014119864](#) A 20151127
PNFP - RU2627960 C2 20170814
PR - US201161548777P 20111019; WO2012US60961 20121019
AP - RU20140119864 20121019
DT - I
CCI - [G02B5/124](#) ; [G02B5/128](#)
CNOI - (C2)
[G02B5/124](#)
PA - (C2)
AVERI DENNISON KORPOREJSHN [US]
TI - (C2)

LIGHT-REDUCING SHEET COATING THAT HAS A SEMITON **PRINTED** FRONT SURFACE

- AB - (C2)
FIELD: physics.SUBSTANCE: coating comprises a **retroreflective film** having a flat surface on the front side and a plurality of **retroreflective** elements on the reverse side and an **ink layer** deposited on said flat surface in a halftone pattern that includes a pattern of light-transmissive lumens between discrete regions of deposited **ink** that receive Incident light and let the returned light pass without obstruction on the side of mentioned **ink**. Light-transmitting gaps and discrete regions of the deposited **ink** determine the front outer surface of the retro-reflective sheet coating.EFFECT: use of such a halftone **ink** pattern increases the reflectivity of the **printed retroreflective** sheeting by reducing the amount of light absorbed by the **ink** and reducing the amount of light scattered by the **ink layer**, and also eliminates the need for a transparent topcoat or **film** on the front surface of the **retroreflective** sheet.21 cl, 20 dwg

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- PN - [IN3485CHENP2014](#) A 20150703
PR - US201161548777P 20111019; WO2012US60961 20121019
AP - IN2014CHENP3485 20140508
DT - I
CCI - [G02B5/124](#) ; [G02B5/128](#)
PA - AVERY DENNISON CORP [US]
TI - **RETROREFLECTIVESHEETING HAVING A HALFTONE PRINTED FRONT SURFACE**
AB - A **printed retroreflective film** has a planar surface on a front side and a plurality of **retroreflective** elements on a back side. A halftone **printed ink layer** is deposited on the planar surface formed from uniformly spaced discrete dots of deposited **ink**. The areas between the dots provide light transmissive openings that receive incident light and transmit retroreflected light. The aggregate area of the dots forming the half tone pattern preferably covers between about 60% and 90% of the area of the half tone pattern. The use of such a halftone pattern of **ink** increases the reflectivity of the **printed retroreflective** sheeting by reducing the amount of light absorbed by the **ink** and by reducing the amount of light scattered by the **layer of ink**. The use of such a halftone pattern of **ink** further obviates the need for an anti light scattering topcoat or **film** over the front surface of the **retroreflective** sheet.

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- PN - [MX2014004832](#) A 20140821
PR - US201161548777P 20111019; WO2012US60961 20121019
AP - MX20140004832 20121019
DT - I
CCI - [G02B5/124](#) ; [G02B5/128](#)
PA - AVERY DENNISON CORP [US]
TI - **RETROREFLECTIVESHEETING HAVING A HALFTONE PRINTED FRONT SURFACE.**
AB - A **printed retroreflective film** has a planar surface on a front side and a plurality of **retroreflective** elements on a back side. A halftone **printed ink layer** is deposited on the planar surface formed from uniformly spaced, discrete dots of deposited **ink**. The

areas between the dots provide light-transmissive openings that receive incident light and transmit retroreflected light. The aggregate area of the dots forming the half-tone pattern preferably covers between about 60% and 90% of the area of the half-tone pattern. The use of such a halftone pattern of **ink** increases the reflectivity of the **printed retroreflective** sheeting by reducing the amount of light absorbed by the **ink**, and by reducing the amount of light scattered by the **layer of ink**. The use of such a halftone pattern of **ink** further obviates the need for an anti-light scattering topcoat or **film** over the front surface of the **retroreflective** sheet.

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PN - [CN103998954](#) A 20140820

PR - WO2012US60961 20121019; US201161548777P 20111019

AP - CN2012862682 20121019

DT - I

CT - || STSE (A)
[US4708920](#) A 19871124 [A] (ORENSTEEN BRUCE D [US], et al)
 [A] 1-15
 * 全文 *;
[WO9937470](#) A1 19990729 [A] (REFLEXITE CORP [US])
 [A] 1-15
 * 全文 *;
[CN101194189](#) A 20080604 [X] (NIPPON CARBIDE KOGYO KK [JP])
 [X] 1-15
 * 说明书第4页第1行至第16页第10行, 附图1-4 *;
[US3430375](#) A 19690304 [A] (ALTMAN GERALD)
 [A] 1-15
 * 全文 *;
[US6325515](#) B1 20011204 [A] (CODERRE JAMES C [US], et al)
 [A] 1-15
 * 全文 *;
[CN1285047](#) A 20010221 [A] (MINNESOTA MINING & MFG [US])
 [A] 1-15
 * 全文 *;
[US2002086143](#) A1 20020704 [A] (TANAKA OSAMU [JP], et al)
 [A] 1-15
 * 全文 *;
[US6506475](#) B1 20030114 [A] (HILL G ROLAND [GB])
 [A] 1-15
 * 全文 *;
[CN1436309](#) A 20030813 [X] (3M INNOVATIVE PROPERTIES CO [US])
 [X] 1-15
 * 说明书第1页第5-20行, 第2页第20行至第5页第25行, 附图1-5 *;
[CN102272638](#) A 20111207 [A]
 [A] 1-15
 * 全文 *;
[WO2011046957](#) A2 20110421 [X] (3M INNOVATIVE PROPERTIES CO [US], et al)
 [X] 1-15
 * 说明书第[0026]-[0077]段, 附图1-2 *

CCI - [G02B5/124](#) ; [G02B5/128](#)
 PA - AVERY DENNISON CORP
 TI - **Retroreflective** sheeting having a halftone **printed** front surface
 AB - A **printed retroreflective film** has a planar surface on a front side and a plurality of **retroreflective** elements on a back side. A halftone **printed ink layer** is deposited on the planar surface formed from uniformly spaced, discrete dots of deposited **ink**. The areas between the dots provide light-transmissive openings that receive incident light and transmit retroreflected light. The aggregate area of the dots forming the half-tone pattern preferably covers between about 60% and 90% of the area of the half-tone pattern. The use of such a halftone pattern of **ink** increases the reflectivity of the **printed retroreflective** sheeting by reducing the amount of light absorbed by the **ink**, and by reducing the amount of light scattered by the **layer of ink**. The use of such a halftone pattern of **ink** further obviates the need for an anti-light scattering topcoat or **film** over the front surface of the **retroreflective** sheet.

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PN - [CA2853078](#) A1 20130516
 PR - US201161548777P 20111019; WO2012US60961 20121019
 AP - CA20122853078 20121019
 DT - I
 CCI - [G02B5/124](#) ; [G02B5/128](#)
 PA - AVERY DENNISON CORP [US]
 TI - **RETROREFLECTIVESHEETING HAVING A HALFTONE PRINTED FRONT SURFACE**
 AB - A **printed retroreflective film** has a planar surface on a front side and a plurality of **retroreflective** elements on a back side. A halftone **printed ink layer** is deposited on the planar surface formed from uniformly spaced, discrete dots of deposited **ink**. The areas between the dots provide light-transmissive openings that receive incident light and transmit retroreflected light. The aggregate area of the dots forming the half-tone pattern preferably covers between about 60% and 90% of the area of the half-tone pattern. The use of such a halftone pattern of **ink** increases the reflectivity of the **printed retroreflective** sheeting by reducing the amount of light absorbed by the **ink**, and by reducing the amount of light scattered by the **layer of ink**. The use of such a halftone pattern of **ink** further obviates the need for an anti-light scattering topcoat or **film** over the front surface of the **retroreflective** sheet.

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PN - [AU2012336200](#) A1 20140529
 PNFP - AU2012336200B B2 20160218
 PR - US201161548777P 20111019; WO2012US60961 20121019
 AP - AU20120336200 20121019
 DT - I
 CT - || STSE (B2)
[US3430375](#) A 19690304 [] (ALTMAN GERALD)
[US6506475](#) B1 20030114 [] (CONTRA VISION LTD [GB])
[US6024455](#) A 20000215 [] (3M INNOVATIVE PROPERTIES CO [US])

[US2009097114](#) A1 20090416 [] (NIPPON CARBIDE KOGYO KK [JP])

- CCI - [G02B5/124](#) ; [G02B5/128](#)
- PA - (A1 B2)
AVERY DENNISON CORP
- TI - (A1 B2)
Retroreflective sheeting having a halftone **printed** front surface
- AB - (A1 B2)
A **printed retroreflective film** has a planar surface on a front side and a plurality of **retroreflective** elements on a back side. A halftone **printed ink layer** is deposited on the planar surface formed from uniformly spaced, discrete dots of deposited **ink**. The areas between the dots provide light-transmissive openings that receive incident light and transmit retroreflected light. The aggregate area of the dots forming the half-tone pattern preferably covers between about 60% and 90% of the area of the half-tone pattern. The use of such a halftone pattern of **ink** increases the reflectivity of the **printed retroreflective** sheeting by reducing the amount of light absorbed by the **ink**, and by reducing the amount of light scattered by the **layer of ink**. The use of such a halftone pattern of **ink** further obviates the need for an anti-light scattering topcoat or **film** over the front surface of the **retroreflective** sheet.

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- PN - [US2013100532](#) A1 20130425
- PNFP - US9746590 B2 20170829
- PR - US201213655660 20121019; US201161548777P 20111019
- AP - US201213655660 20121019
- DT - *; Rep
- CT - || R141 (A1)
[US6024455](#) A 20000215 [] (O'NEILL MARK [US], et al);
[US6506475](#) B1 20030114 [] (HILL G ROLAND [GB])
- || STSE (B2)
[US6024455](#) A 20000215 [] (O'NEILL MARK [US], et al);
[US6506475](#) B1 20030114 [] (HILL G ROLAND [GB])
- CCI - [G02B5/124](#) ; [G02B5/128](#)
- PA - (A1)
AVERY DENNISON CORP [US]; AVERY DENNISON CORP [US]
- (B2)
AVERY DENNISON CORP [US]
- TI - (A1)
Retroreflective Sheetting Having a Halftone **Printed** Front Surface
- (B2)
Retroreflective sheeting having a halftone **printed** front surface
- AB - (A1 B2)
A **printed retroreflective film** has a planar surface on a front side and a plurality of **retroreflective** elements on a back side. A halftone **printed ink layer** is deposited on the planar surface formed from uniformly spaced, discrete dots of deposited **ink**. The areas between the dots provide light-transmissive openings that receive incident light

and transmit retroreflected light. The aggregate area of the dots forming the half-tone pattern preferably covers between about 60% and 90% of the area of the half-tone pattern. The use of such a halftone pattern of **ink** increases the reflectivity of the **printed retroreflective** sheeting by reducing the amount of light absorbed by the **ink**, and by reducing the amount of light scattered by the **layer** of **ink**. The use of such a halftone pattern of **ink** further obviates the need for an anti-light scattering topcoat or **film** over the front surface of the **retroreflective** sheet.

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- PN - [WO2013070413](#) A1 20130516
- PR - US201161548777P 20111019
- AP - WO2012US60961 20121019
- DT - **
- CT - |EP| ISR (A1)
[US3430375](#) A 19690304 [XIY] (ALTMAN GERALD)
 [X] 1,4-5,8-14
 * abstract *
 * column 7, line 39 - column 8, line 11; claim 24 *
 [I] 2-3,6,15
 [Y] 7;
[US2009097114](#) A1 20090416 [XIY] (MIMURA IKUO [JP], et al)
 [X] 1,7,10-12,14-15
 * abstract *
 * paragraphs [0011] , [0069] - [0072] - [0079] - [0085] - [0095] - [0104] - [0132] - [0139]
 - [0167] *
 [I] 9
 [Y] 7;
[US4708920](#) A 19871124 [A] (ORENSTEEN BRUCE D [US], et al)
 [A] 1-15
 * the whole document *
- CCI - [G02B5/124](#) ; [G02B5/128](#)
- PA - AVERY DENNISON CORP [US]
- TI - **RETROREFLECTIVESHEETING HAVING A HALFTONE PRINTED FRONT SURFACE**
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PN - [JP2000347014](#) A 20001215

PR - JP19990162195 19990609

AP - JP19990162195 19990609

DT - I

FI - G02B5/128; G09F19/12&A

FT - 2H042/EA07; 2H042/EA14; 2H042/EA17

PA - TEIKOKU PRINTING INK MFG

TI - **RETROREFLECTIVE**BODY AND ITS PRODUCTION

AB - PROBLEM TO BE SOLVED: To provide a **retroreflective** body in which the distribution state of glass beads is properly controlled all over the **printed** face to obtain proper retroreflection, and to provide the method for its production. SOLUTION: A screen plate 13 is preliminarily prepared by forming a part 10 where the plate **film** is formed and a part 11 where the plate **film** is not formed on a screen 9. Then a substrate 2 on which a reflection **layer** 3 is formed is disposed under the screen plate 13 and subjected to screen printing using a glass bead **ink**. When the screen 9 is pressed by a squeegee 14, the part 10, 10 where the plate **film** is formed near the part 11 where the plate **film** is not formed touches the reflection **layer** 3 to act as a spacer. Therefore, the pressed and contact state of the screen 9 with the squeegee 14 while the squeegee 14 is pressed and moved parallel to the screen 9 is made uniform in the part 11 where the plate **film** is not formed between the parts 10 where the plate **film** is formed. As a result, the amount of the glass beads pushed through the part 11 where the plate **film** is not formed is almost constant without an excess or too small amount.