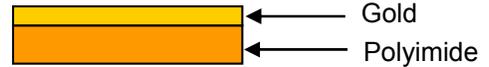


## PRODUCT BULLETIN

### Gold Coated (One Side) Polyimide



Sheldahl® Brand Materials construction of polyimide films that are gold coated on one side are typically used as first surface mirrors in multi-layer insulation (MLI) blankets when a wide temperature range is desired. These products provide extremely low emittance and moderate solar absorptance.

This product may be ordered with 0.3, 0.5, 1, 2, 3, or 5 mil thick polyimide that conforms to the requirements of ASTM D-5213. The gold coating is nominally 900 Å thick, and the most common width is 48 inches (1.22 m).

### PRODUCT CHARACTERISTICS

Parameter (independent of film thickness)	Specified Value
First surface solar absorptance ( $\alpha$ )	$\leq 0.30$
First surface hemispherical emittance ( $\epsilon_H$ )	$\leq 0.03$
First surface normal emittance ( $\epsilon_N$ )	$\leq 0.03$
Typical first surface $\alpha/\epsilon$	10
Gold surface resistivity	$\leq 1 \Omega/\text{square}$
Intermittent temperature range	-250° C to 400° C (-420° F to 750° F)
Continuous temperature range	-250° C to 290° C (-420° F to 550° F)

Standard Item Number	Thickness mil ( $\mu\text{m}$ )	Typical Weight ( $\text{g}/\text{m}^2$ )	Perforation Item Number
146442	0.5 (12.5)	19	TBD
146437	1.0 (25)	36	159884
146439	2.0 (51)	71	TBD
146440	3.0 (76)	109	TBD
146441	5.0 (127)	181	TBD



A Multek Brand

## POST PROCESSING – PERFORATION & EMBOSSING

This product may be processed after metalizing to enhance its functionality. The film may be Perforated to facilitate air passage during launch. Standard perforation patterns are on pages 14 - 22.

Materials may also be embossed to provide separation between the layers of an MLI blanket instead of, or in addition to, using fabric spacer layers.

## WARRANTY INFORMATION

Multek warrants that our thermal control materials will meet all acceptance testing criteria for one year from the date of shipment (except Germanium, see product bulletin) if the materials have been stored indoors at standard conditions in their original packaging.

## SHELF LIFE

This product shall meet specified values for a minimum of 12 months after the date of shipment provided that the material is stored in its original unopened container at normal interior temperatures (10° C to 27° C/50° F to 80° F).

The shelf life of the material should be much longer than the warranty period. We recommend retesting any material that is more than one year old (or more than one year since most recent testing) prior to use. This will verify that the material has not been accidentally damaged. Multek offers retest services for a nominal fee.

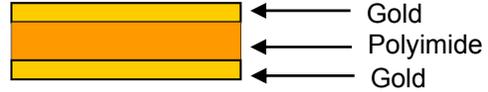
## SPECIFICATION AND ITEM NUMBERS

STANDARD NUMBERS		Thickness	PERFORATION NUMBERS	
Multek Specification	Item Number		Multek Specification	Item Number
G404960	146442	0.5 mil	G404964	TBD
G404910	146437	1.0 mil	G404914	159884
G404920	146439	2.0 mil	G404924	TBD
G404930	146440	3.0 mil	G404934	TBD
G404950	146441	5.0 mil	G404954	TBD

Multek manufactures a broad range of vacuum deposited films, laminates and tapes. Ask for additional product bulletins describing other Sheldahl® Brand Materials.

The information on this product bulletin is based on data obtained by our research and is considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data and the results obtained from the use thereof. This information is furnished upon the condition that the recipient shall conduct tests to determine the suitability of the product for his or her particular application.

## PRODUCT BULLETIN



### Gold Coated (Two Sides) Polyimide

Sheldahl® Brand Materials construction of polyimide films that are gold coated on both sides can be used as first surface mirrors, and are often used in multi-layer insulation (MLI) blankets when a wide temperature range is desired. These products provide the lowest possible emittance and moderate solar absorptance.

This product may be ordered with 0.3, 0.5, 1, 2, 3, or 5 mil thick polyimide that conforms to the requirements of ASTM D-5213. The gold coating is nominally 900 Å thick, and the most common width is 48 inches (1.22 m).

### PRODUCT CHARACTERISTICS

Parameter (independent of film thickness)	Specified Value
First surface solar absorptance ( $\alpha$ )	$\leq 0.30$
First surface hemispherical emittance ( $\epsilon_H$ )	$\leq 0.03$
First surface normal emittance ( $\epsilon_N$ )	$\leq 0.03$
Typical first surface $\alpha/\epsilon$	15
Gold surface resistivity	$\leq 1 \Omega/\text{square}$
Intermittent temperature range	-250° C to 400° C (-420° F to 750° F)
Continuous temperature range	-250° C to 290° C (-420° F to 550° F)

Standard Item Number	Thickness mil ( $\mu\text{m}$ )	Typical Weight ( $\text{g}/\text{m}^2$ )	PERFORATION Item Number
146407	0.5 (12.5)	19	TBD
147286	1.0 (25)	36	TBD
158239	2.0 (51)	71	TBD
146406	3.0 (76)	109	TBD
166185	5.0 (127)	181	166186



A Multek Brand

## POST PROCESSING – PERFORATION & EMBOSSING

This product may be processed after metalizing to enhance its functionality. The film may be Perforated to facilitate air passage during launch. Standard perforation patterns are on pages 14 - 22.

Materials may also be embossed to provide separation between the layers of MLI blankets instead of, or in addition to, using fabric spacer layers.

## WARRANTY INFORMATION

Multek warrants that our thermal control materials will meet all acceptance testing criteria for one year from the date of shipment (except Germanium, see product bulletin) if the materials have been stored indoors at standard conditions in their original packaging.

## SHELF LIFE

This product shall meet specified values for a minimum of 12 months after the date of shipment provided that the material is stored in its original unopened container at normal interior temperatures (10° C to 27° C/50° F to 80° F).

The shelf life of the material should be much longer than the warranty period. We recommend retesting any material that is more than one year old (or more than one year since most recent testing) prior to use. This will verify that the material has not been accidentally damaged. Multek offers retest services for a nominal fee.

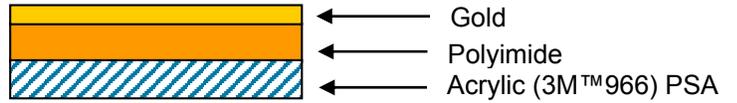
## SPECIFICATION AND ITEM NUMBERS

STANDARD NUMBERS		Thickness	PERFORATION NUMBERS	
Multek Specification	Item Number		Multek Specification	Item Number
G401860	146407	0.5 mil	G401864	TBD
G401810	147286	1.0 mil	G401814	TBD
G401820	158239	2.0 mil	G401824	TBD
G401830	146406	3.0 mil	G401834	TBD
G401850	166185	5.0 mil	G401854	166186

Multek manufactures a broad range of vacuum deposited films, laminates and tapes. Ask for additional product bulletins describing other Sheldahl® Brand Materials.

The information on this product bulletin is based on data obtained by our research and is considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data and the results obtained from the use thereof. This information is furnished upon the condition that the recipient shall conduct tests to determine the suitability of the product for his or her particular application.

## PRODUCT BULLETIN



### First Surface Gold Coated Polyimide Tape with Acrylic 3M™ 966 Adhesive

Sheldahl® Brand Materials first surface gold coated polyimide tapes with acrylic 3M™966 adhesive are used whenever a very low emittance and moderate solar absorptance surface is needed. The acrylic 3M™966 adhesive is nominally 2.3 mils thick, provides a strong bond with low outgassing, and can be used over a moderate temperature range. These tapes may be bonded to structures to reduce radiative heat transfer. They can also be used on multilayer insulation blankets to close the edges or repair rips in the outer layers.

This product may be ordered with 0.5, 1, or 2 mil thick polyimide that conforms to the requirements of ASTM D-5213. The gold coating is nominally 900 Å thick. Although the standard widths for this tape are 1, 2, 3, and 4 inches, it may be ordered in any width needed. Each roll is 108 feet (33 m) long.

### PRODUCT CHARACTERISTICS

Parameter (independent of film thickness)	Specified Value
Absorptance ( $\alpha$ )	$\leq 0.30$
Hemispherical emittance ( $\epsilon_H$ )	$\leq 0.03$
Normal emittance ( $\epsilon_N$ )	$\leq 0.03$
Typical $\alpha/\epsilon$	15
Adhesion to stainless steel	$\geq 20$ oz./inch of width
Intermittent temperature range	-185° C to 230° C (-300° F to 450° F) <sup>A</sup>
Continuous temperature range	-60° C to 120° C (-75° F to 250° F) <sup>A</sup>

<sup>A</sup> Zero peel strength of acrylic pressure sensitive adhesive is at about -45°C (-50°F).

Standard Item Number	Thickness mil ( $\mu\text{m}$ )	Typical Weight ( $\text{g}/\text{m}^2$ )	Perforation Item Number
146487	0.5 (12.5)	81	TBD
146482	1.0 (25)	98	146483
146486	2.0 (51)	133	TBD



A Multek Brand

## POST PROCESSING – PERFORATION & COVERLAY

This product may be processed after metalizing and combining the adhesive to the film to enhance its functionality. We offer a standard perforation pattern with 0.76 mm (0.03 in.) diameter holes on 6.35 mm (0.25 in.) centers, with a nominal 1.1% open area. We can also place a coverlay on the tape to protect it from accidental damage during handling and application.

## WARRANTY INFORMATION

Multek warrants that our thermal control materials will meet all acceptance testing criteria for one year from the date of shipment (except Germanium, see product bulletin) if the materials have been stored indoors at standard conditions in their original packaging.

## SHELF LIFE

This product shall meet specified values for a minimum of 12 months after the date of shipment provided that the material is stored in its original unopened container at normal interior temperatures (10° C to 27° C/50° F to 80° F).

The shelf life of the material should be much longer than the warranty period. We recommend retesting any material that is more than one year old (or more than one year since most recent testing) prior to use. This will verify that the material has not been accidentally damaged. Multek offers retest services for a nominal fee.

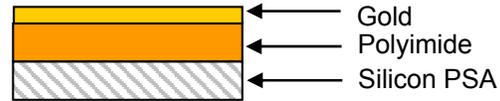
## SPECIFICATION AND ITEM NUMBERS

STANDARD NUMBERS		Thickness	PERFORATION NUMBERS	
Multek Specification	Item Number		Multek Specification	Item Number
G406400	146482	1.0 mil	G406401	146483
G406420	146486	2.0 mil	G406421	TBD
G406460	146487	0.5 mil	G406461	TBD

Multek manufactures a broad range of vacuum deposited films, laminates and tapes. Ask for additional product bulletins describing other Sheldahl® Brand Materials.

The information on this product bulletin is based on data obtained by our research and is considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data and the results obtained from the use thereof. This information is furnished upon the condition that the recipient shall conduct tests to determine the suitability of the product for his or her particular application.

## PRODUCT BULLETIN



### First Surface Gold Coated Polyimide Tape with Silicon Adhesive

Sheldahl® Brand Materials first surface gold coated polyimide tapes with Silicon adhesive are used whenever a very low emittance and moderate solar absorptance surface is needed. The Silicon adhesive is nominally 1 mil thick, provides a strong bond with moderate outgassing, and can be used over a wide temperature range. These tapes may be bonded to structures to reduce radiative heat transfer. They can also be used on multilayer insulation blankets to close the edges or repair rips in the outer layers.

This product may be ordered with 0.5, 1, or 2 mil thick polyimide that conforms to the requirements of ASTM D-5213. The gold coating is nominally 900 Å thick. Although the standard widths for this tape are 1, 2, 3, 4, and 6 inches, it may be ordered in widths up to 26 inches. Rolls no more than 4 inches wide are 108 feet (33 m) long; the 6 inch wide rolls are 54 feet (16.5 m) long.

### PRODUCT CHARACTERISTICS

Parameter (independent of film thickness)	Specified Value
Absorptance ( $\alpha$ )	$\leq 0.30$
Hemispherical emittance ( $\epsilon_H$ )	$\leq 0.03$
Normal emittance ( $\epsilon_N$ )	$\leq 0.03$
Typical $\alpha/\epsilon$	15
Adhesion to stainless steel	$\geq 10$ oz./inch of width
Intermittent temperature range	-185° C to 260° C (-300° F to 500° F)
Continuous temperature range	-185° C to 150° C (-300° F to 300° F)

Standard Item Number	Thickness mil ( $\mu\text{m}$ )	Typical Weight ( $\text{g}/\text{m}^2$ )	Perforation Item Number
TBD	0.5 (12.5)	54	TBD
146498	1.0 (25)	71	TBD
146500	2.0 (51)	107	TBD



A Multek Brand

## POST PROCESSING – PERFORATION & COVERLAY

This product may be processed after gold coating and combining the adhesive to the film to enhance its functionality. We offer a standard perforation pattern with 0.76 mm (0.03 in.) diameter holes on 6.35 mm (0.25 in.) centers, with a nominal 1.1% open area. We can also place a coverlay on the tape to protect it from accidental damage during handling and application.

## WARRANTY INFORMATION

Multek warrants that our thermal control materials will meet all acceptance testing criteria for one year from the date of shipment (except Germanium, see product bulletin) if the materials have been stored indoors at standard conditions in their original packaging.

## SHELF LIFE

This product shall meet specified values for a minimum of 12 months after the date of shipment provided that the material is stored in its original unopened container at normal interior temperatures (10° C to 27° C/50° F to 80° F).

The shelf life of the material should be much longer than the warranty period. We recommend retesting any material that is more than one year old (or more than one year since most recent testing) prior to use. This will verify that the material has not been accidentally damaged. Multek offers retest services for a nominal fee.

## SPECIFICATION AND ITEM NUMBERS

STANDARD NUMBERS		Thickness	PERFORATION NUMBERS	
Multek Specification	Item Number		Multek Specification	Item Number
G407960	TBD	0.5 mil	G407961	TBD
G407910	146498	1.0 mil	G407911	TBD
G407920	146500	2.0 mil	G407921	TBD

Multek manufactures a broad range of vacuum deposited films, laminates and tapes. Ask for additional product bulletins describing other Sheldahl® Brand Materials.

The information on this product bulletin is based on data obtained by our research and is considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data and the results obtained from the use thereof. This information is furnished upon the condition that the recipient shall conduct tests to determine the suitability of the product for his or her particular application.