

MATERIAL PROPERTIES FOR PLASCORE COMPONENTS

The following information is provided by Plascore, Inc., as a general guideline for the performance and quality for the cleanroom wall components. The information is intended to be a general guideline, and may not address specific, custom situations which may appear on any particular project. Please consult Plascore, Inc., for any specific details.

PANEL STRUCTURAL PROPERTIES

Wall panels shall be designed and manufactured for use in wall systems requiring frequent demounting and changes. Panel shall be lightweight, resist warping and shrinkage, and shall allow easy cutting, routing, and drilling in the field.

Panels cut in the field (after cleaning) will not release particles nor do they require to be sealed after cutting.

| | | |
|----------------------------|----------------|---|
| <u>Construction:</u> | Skin Material: | aluminum sheet (0.032" thick typically) |
| | Core Material: | Plascore aluminum honeycomb PCGA ¾-1.8 |
| | Adhesive: | Plascore epoxy |
| <u>Weight:</u> | | 1.3 pounds per square foot (±10%) |
| <u>Flatness:</u> | | < 0.007" bow per linear foot |
| <u>Length & Width:</u> | | ± 1/16" of required dimension |
| <u>Thickness:</u> | | ± 0.012" of nominal dimension |

PANEL FLAMMABILITY PROPERTIES

| | |
|------------------|------------------|
| Test Method: | ASTM E84-84 |
| Panel Thickness: | 0.25 – 2.00" |
| Minimum Results: | Smoke 10.0 |
| | Flamespread 10.0 |

PANEL COATING PROPERTIES

The coating materials shall not shed particles, not attract airborne particles, and be durable in a regular cleanroom environment.

Antistatic Properties (where applicable): The panel surface shall have a uniform electrical resistance across the entire panel surface. The uniformity of the surface resistance shall be established by using a 500 VDC Ohmmeter with (2) pointed contact probes. The contact probes shall be touching the surface of the panel 36" apart from each other and the initial reading shall be 20 k. One of the two probes shall then be dragged across the panel surface towards the other probe. The resistance reading

shall never vary more than 5 k.

The panel-to-ground resistance shall be measured by utilizing test methods and apparatus described in ASTM F150-72. The resistance to ground shall not exceed 50 k.

The panel conductivity from the front panel surface to the back panel surface shall be measured using the same apparatus as described in ASTM F150-72. Each probe shall contact one panel surface and be placed 36" apart. The resultant readings should not exceed 25 k.

| Coating Properties: | Test Method: | Results: |
|---------------------|----------------------------------|--------------------|
| Paint Adhesion | ASTM D3359 (method B) | 5B |
| Pencil Hardness | ASTM D3363 | > 3H |
| Impact Resistance | ASTM D2794 (2 lb, 1/2"ball) | 1.5 X Mil T in-lbs |
| Tabor Abrasion | ASTM D4060-84 (CS 10, 100cycles) | 10 mg maximum |
| Flexibility | ASTM D1737-62 (1/2" diameter) | pass |
| Chemical Resistance | | (see Tables below) |

TABLE I a (for Epoxy and Acrylic paints)

| Chemical | Strength | Time of Exposure | | | | | |
|-------------------|----------|------------------|------|------|------|------|-------|
| | | 10' | 1 hr | 3 hr | 5 hr | 8 hr | 24 hr |
| Sulfuric acid | 50% | 0 | 0 | 0 | 0 | 0 | 0 |
| Nitric Acid | 50% | 1 | 1 | 2 | 3 | 3 | 3 |
| Hydrofluoric acid | 50% | 3 | 3 | 3 | 3 | 3 | 3 |
| Ammonium Hydr. | 30% | 0 | 0 | 0 | 0 | 0 | 0 |
| Sodium Hydroxide | 50% | 0 | 0 | 0 | 0 | 1 | 2 |
| Hydrogen Peroxide | 30% | 0 | 0 | 0 | 0 | 1 | 3 |
| Xylene | 100% | 0 | 0 | 0 | 0 | 0 | 0 |

0 - No attack
1- Surface slightly whitened
2 - Slightly whiter than 1
3 - Attacked - blistering

TABLE I b (for Polyester paints)

| Chemical | Strength | Time of Exposure | | | | | |
|-------------------|----------|------------------|------|------|------|------|-------|
| | | 10' | 1 hr | 3 hr | 5 hr | 8 hr | 24 hr |
| Sulfuric acid | 50% | 0 | 0 | 1 | 1 | 1 | 1 |
| Nitric Acid | 50% | 2 | 2 | 3 | 3 | 3 | 3 |
| Hydrofluoric acid | 50% | 3 | 3 | 3 | 3 | 3 | 3 |
| Ammonium Hydr. | 30% | 0 | 0 | 0 | 0 | 0 | 0 |
| Sodium Hydroxide | 50% | 0 | 0 | 0 | 1 | 1 | 2 |
| Hydrogen Peroxide | 30% | 0 | 0 | 3 | 3 | 3 | 3 |
| Xylene | 100% | 0 | 0 | 0 | 0 | 0 | 0 |

0 - No attack
1- Surface slightly whitened
2 - Slightly whiter than 1
3 - Attacked - blistering

PANEL OUTGASSING PERFORMANCE

If requested, Plascore panels shall provide a certificate of compliance issued by an accredited testing laboratory that the following outgassing rates are not exceeded by the listed wall components when tested according to the test method provided.

| Material: | Test Method: | Results: | | |
|--------------------------|--------------|----------|------|------|
| | | ppm/mg | TML | CVCM |
| Wall panel skin material | ASTM E595 | <.60 | < 1% | < 1% |
| Wall panel core material | ASTM E595 | <.15 | < 1% | < 1% |
| Wall panel adhesive | ASTM E595 | <.15 | < 1% | < 1% |

EXTRUSION STRUCTURAL PROPERTIES

| | |
|----------------------|---|
| <u>Length:</u> | ± 0.032" of required dimension |
| <u>Straightness:</u> | 0.125" x Length (feet) |
| <u>Twist:</u> | ¼ degree per foot to a maximum of 3 degrees over length of part |
| <u>Flatness:</u> | 0.004" x W (inches) |

EXTRUSION COATING PROPERTIES

The coating materials shall not shed particles, not attract airborne particles, and be durable in a regular cleanroom environment.

| Coating Properties: | Test Method: | Results: |
|---------------------|-------------------------------|--------------------|
| Paint Adhesion | ASTM D3359 (method B) | 5B |
| Pencil Hardness | ASTM D3363 | > 3H |
| Tabor Abrasion | ASTM D4060 (CS 10, 100cycles) | 10 mg maximum |
| Chemical Resistance | | (see Tables below) |

TABLE II a (for Epoxy and acrylic paints)

| Chemical | Strength | Time of Exposure | | | | | |
|-------------------|----------|------------------|------|------|------|------|-------|
| | | 10' | 1 hr | 3 hr | 5 hr | 8 hr | 24 hr |
| Sulfuric acid | 50% | 0 | 0 | 0 | 0 | 0 | 0 |
| Nitric Acid | 50% | 0 | 0 | 1 | 1 | 2 | 3 |
| Hydrofluoric acid | 50% | 3 | 3 | 3 | 3 | 3 | 3 |
| Ammonium Hydr. | 30% | 0 | 0 | 0 | 0 | 0 | 0 |
| Sodium Hydroxide | 50% | 0 | 0 | 0 | 0 | 1 | 2 |
| Hydrogen Peroxide | 30% | 0 | 0 | 0 | 0 | 1 | 3 |
| Xylene | 100% | 0 | 0 | 0 | 0 | 0 | 0 |

0 - No attack
 1- Surface slightly whitened
 2 - Slightly whiter than 1
 3 - Attacked - blistering

TABLE II b (for Polyester paints)

| Chemical | Strength | Time of Exposure | | | | | |
|-------------------|----------|------------------|------|------|------|------|-------|
| | | 10' | 1 hr | 3 hr | 5 hr | 8 hr | 24 hr |
| Sulfuric acid | 50% | 0 | 0 | 1 | 1 | 1 | 1 |
| Nitric Acid | 50% | 2 | 2 | 3 | 3 | 3 | 3 |
| Hydrofluoric acid | 50% | 3 | 3 | 3 | 3 | 3 | 3 |
| Ammonium Hydr. | 30% | 0 | 0 | 0 | 0 | 0 | 0 |
| Sodium Hydroxide | 50% | 0 | 0 | 0 | 1 | 1 | 2 |
| Hydrogen Peroxide | 30% | 0 | 0 | 3 | 3 | 3 | 3 |
| Xylene | 100% | 0 | 0 | 0 | 0 | 0 | 0 |

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3 - Attacked – blistering

TABLE II c (for Anodized Surfaces)

| Chemical | Strength | Time of Exposure | | | | | |
|-------------------|----------|------------------|-----|-----|-----|-----|------|
| | | 10' | 1hr | 3hr | 5hr | 8hr | 24hr |
| Sulfuric acid | 50% | 0 | 0 | 0 | 0 | 0 | 0 |
| Nitric acid | 50% | 0 | 0 | 1 | 1 | 2 | 3 |
| Hydrofluoric acid | 50% | 3 | 3 | 3 | 3 | 3 | 3 |
| Ammonium Hydr. | 30% | 0 | 0 | 0 | 0 | 0 | 0 |
| Sodium Hydroxide | 50% | 0 | 0 | 0 | 0 | 1 | 2 |
| Hydrogen Peroxide | 30% | 0 | 0 | 0 | 0 | 1 | 3 |
| Xylene | 100% | 0 | 0 | 0 | 0 | 0 | 0 |

0 - No attack
1 – Surface slightly whitened

2 – Slightly whiter than 1
3 – Attacked - blistering

Please contact Plascore with any material properties questions or concerns.

(End of Section)