

Starting Formulation

SF 1202

Low Temperature Cure Gloss White Enamels

EPON™ Resin 8021 / EPIKURE™ Curing Agent 3292-FX-60 and 3378

| Formula A <u>Material</u> | <u>Supplier</u> | <u>Pounds</u> | <u>Gallons</u> |
|-----------------------------------------------------|---------------------------|---------------|----------------|
| EPON Resin 8021/ Part A | | | |
| EPIKURE Curing EPON Resin 8021 | Hexion | 150.0 | 16.30 |
| Agent 3292-FX-60 Anti-Terra™ U | BYK-Chemie, USA | 5.3 | 0.68 |
| Beetle™ U216-8 | CYTEC Industries Inc. | 5.3 | 0.62 |
| Ti-Pure™ R-960 | Du Pont Co. | 200.0 | 6.19 |
| Sparmite™ | Harcross Pigments Inc. | 45.0 | 1.23 |
| Microtalc™ MP-15-38 | Specialty Minerals Inc. | 45.0 | 1.99 |
| Bentone™ SD-2 | Elementis Specialties Co. | 1.4 | 0.11 |
| <i>High Speed Disperse to 7Hegman, letdown with</i> | | | |
| EPON Resin 8021 | Hexion | 160.0 | 17.38 |
| Xylene | | 19.0 | 2.64 |
| MIBK | | <u>19.0</u> | <u>2.86</u> |
| | Total Part A | 650.0 | 50.0 |
| Part B | | | |
| EPIKURE Curing Agent 3292-FX-60 | Hexion | 390.8 | 45.98 |
| Xylene | | 19.8 | 2.76 |
| N-butanol | | <u>8.5</u> | <u>1.26</u> |
| | Total Part B | 419.1 | 50.0 |
| | Total Part A & B | 1069.1 | 100.0 |
| Formula B <u>Material</u> | <u>Supplier</u> | <u>Pounds</u> | <u>Gallons</u> |
| EPON Resin 8021/ Part A | | | |
| EPIKURE Curing EPON Resin 8021 | Hexion | 175.0 | 19.02 |
| Agent 3378 Anti-Terra™ U | BYK-Chemie, USA | 7.6 | 0.98 |
| Beetle™ 216-8 | CYTEC Industries Inc. | 7.6 | 0.90 |
| Ti-Pure™ R-960 | Du Pont Co. | 290.0 | 8.98 |

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| | | | |
|-----------------------------------------------------|---------------------------|------------|-------------|
| Sparmite™ | Harcross Pigments Inc. | 60.0 | 1.63 |
| Microtalc™ MP-15-38 | Specialty Minerals Inc. | 60.0 | 2.65 |
| Bentone™ SD-2 | Elementis Specialties Co. | 2.1 | 0.15 |
| <i>High Speed Disperse to 7Hegman, letdown with</i> | | | |
| EPON Resin 8021 | Hexion | 275.0 | 29.89 |
| Xylene | | 8.5 | 1.18 |
| MIBK | | <u>8.5</u> | <u>1.29</u> |
| Total Part A | | 894.3 | 66.67 |
| Part B | | | |
| EPIKURE Curing Agent 3378 | Hexion | 272.3 | 31.66 |
| Xylene | | 8.3 | 1.15 |
| N-butanol | | <u>3.5</u> | <u>0.52</u> |
| Total Part B | | 284.1 | 33.33 |
| Total Part A & B | | 1178.4 | 100.0 |

Formula A Table 1 / Typical Coating Properties

| | <u>Units</u> | <u>Value</u> | |
|----------------------------------|--------------|--------------|--------------|
| Mix ratio Part A : Part B | By volume | 1 : 1 | |
| | By weight | 1.55 : 1.0 | |
| Total weight solids | % | 78.7 | |
| Total volume solids | % | 67.7 | |
| PVC | % | 13.9 | |
| Induction time | min. | 30 | |
| Volatile Organic Compounds (VOC) | #/gal | 2.25 | |
| | g/l | 270 | |
| Curing agent based on solids | phr | 75 | |
| | <u>Units</u> | <u>Value</u> | <u>Value</u> |
| Cure Development | | @ 77 °F | @ 40 °F |
| Set-to-touch | hrs | 0.5 | – |
| Cotton-free | hrs | 1.0 | – |
| Thru-dry | hrs | 3.25 | 24 |
| 24 hour pencil hardness | | F | 6B |
| 12 day pencil hardness | | F | HB |

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Formula A Table 2 / Ambient Cure Film Properties

| | <u>Units</u> | <u>Value</u> |
|----------------------------------------------------|--------------|--------------|
| Drawdown on CRS –Cured for 7 days @ T7°F, 55% R.H. | | |
| 225 g Pot Life (from 74 – 140 KU) | min. | 35 |
| Specular gloss (60/20 degree) | | 100/91 |
| Dry film thickness | mils | 1.5 |
| Impact resistance, (Dir./Rev.) | | 52/8 |
| Flexibility | Pass | 1/8 |
| Adhesion | | 5A |
| MEK double rub | | >300 |
| Water resistance | | |
| 500 hrs at 140 °F | | 8MD |
| 1000 hrs at 140 °F | | 4D |
| Salt spray testing | | |
| 500 hrs | | 6M |
| 1000 hrs | | 4M |

Formula A Table 3 / Low Temperature Cure Film Properties

| | <u>Units</u> | <u>Value</u> |
|-----------------------------------------------------|--------------|--------------|
| Drawdown on CRS –Cured for 14 days @ 40°F, 80% R.H. | | |
| Specular gloss (60/20 degree) | | 64/20 |
| Dry film thickness | mils | 1.5 |
| Impact resistance, (Dir./Rev.) | | 108/104 |
| Flexibility | Pass | 1/8 |
| Adhesion | | 5A |
| MEK double rub | | 91 |
| Water resistance | | |
| 500 hrs at 140 °F | | 6M |
| 1000 hrs at 140 °F | | 6D |
| Salt spray testing | | |
| 500 hrs | | 6M |
| 1000 hrs | | 6D |

Formula B Table 4 / Typical Coating Properties

| | <u>Units</u> | <u>Value</u> |
|---------------------------|--------------|--------------|
| Mix ratio Part A : Part B | By volume | 2 : 1 |
| | By weight | 3.15 : 1.0 |
| Total weight solids | % | 97.1 |
| Total volume solids | % | 95.3 |

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| | | |
|----------------------------------|------|------|
| PVC | % | 14 |
| Induction time | min. | 0 |
| Volatile Organic Compounds (VOC) | | |
| Pounds/gallon | | 0.28 |
| Grams/liter | | 34 |
| Curing agent phr, on solids | phr | 60 |

| | <u>Units</u> | <u>Value</u> | <u>Value</u> |
|-------------------------|--------------|--------------|--------------|
| Cure Development | | @ 77 °F | @ 40 °F |
| Set-to-touch | hrs | 5.5 | – |
| Cotton-free | hrs | 6.5 | – |
| Thru-dry | hrs | 11.0 | 48 |
| 24 hour pencil hardness | | <6B | <6B |
| 12 day pencil hardness | | 5B | 5B |

Formula B Table 5 / Ambient Cure Film Properties

| | <u>Units</u> | <u>Value</u> |
|----------------------------------------------------|--------------|--------------|
| Drawdown on CRS –Cured for 7 days @ 77°F, 55% R.H. | | |
| 225 g Pot Life (from 83 – 140 KU) | min. | 45 |
| Specular gloss (60/20 degree) | | 85/40 |
| Dry film thickness | mils | 1.5 |
| Impact resistance, (Dir./Rev.) | | 160/160 |
| Flexibility | | Pass 1/8 |
| Adhesion | | 5A |
| MEK double rub | | 66 |
| Water resistance | | |
| 500 hrs at 140 °F | | 6F |
| 1000 hrs at 140 °F | | 6M |
| Salt spray testing | | |
| 500 hrs | | 6D |
| 1000 hrs | | 4MD |

Formula B Table 6 / Low Temperature Cure Film Properties

| | <u>Units</u> | <u>Value</u> |
|-----------------------------------------------------|--------------|--------------|
| Drawdown on CRS -Cured for 14 days @ 40°F, 80% R.H. | | |
| Specular gloss (60/20 degree) | | 96/80 |
| Dry film thickness | mils | 1.5 |
| Impact resistance, (Dir./Rev.) | | 160/160 |
| Flexibility | | Pass 1/8 |
| Adhesion | | 5A |

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| | |
|--------------------|-----|
| MEK double rub | 20 |
| Water resistance | |
| 500 hrs at 140 °F | NE |
| 1000 hrs at 140 °F | 8F |
| Salt spray testing | |
| 500 hrs | 6VF |
| 1000 hrs | 6MD |

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