

## Niax\* catalyst A-400

### Description

Niax catalyst A-400 lets you reap the benefits of extended pour times and increased open foam. A liquid, watersoluble tertiary amine composition, Niax catalyst A-400 promotes the blowing reaction in the production of your molded polyurethane foams. As flexible as it is efficient, Niax catalyst A-400 may be added as a separate stream or blended with water or polyol for metering to the mixing head of the machine.

Niax catalyst A-400 delivers the bonus of delayed-action enhancement. Both Niax catalyst A-400 and Niax catalyst A-300 belong to a new class of delayed-action catalysts with unique properties that offer a wide variety of molders the benefit of delaying the reaction while they produce substantially more open foam.

### Key Features and Benefits

Niax catalyst A-400 provides a wealth of added values.

The "Momentive Performance Materials Difference" includes:

- Delayed blow reaction for extended pour times needed to produce complex parts.
- Considerable reduction in force-to-crush, indicating enhanced production of open foam when compared with competitive delayed-action catalysts.
- Much lower amine fugitivity.
- Far less corrosive to mild steel

### Typical Physical Properties

|   |            |
|---|------------|
| Specific Gravity at 25°C  | 1.115      |
| Viscosity at 25°C, cP   | 140        |
| Solubility in Water at 20°C                                     | Complete   |
| Flash Point, Pensky-Martens Closed Cup <sup>(1)</sup> , °C (°F) | >93 (>200) |

(1) ASTM Test Method D93

### Potential Applications

Niax catalyst A-400 may be used in the production of automotive seating.

Please note that:

- The reaction profile of Niax catalyst A-400 is similar to that of Niax catalyst A-107
- The delayed-action feature is particularly useful in high-reactivity systems
- In a typical molded foam application, the delayed blowing produced by Niax catalyst A-400 should be used in combination with a gelation catalyst such as Niax catalyst A-33 or Niax catalyst A-300

**Performance Data**

Table 1 shows formulations that are typical of North American rapid-demold seating systems. The two in columns 1-4 are firmer, cushion-type formulations. The formulation in columns 5 and 6 is a softer seatback type.

Formulations in columns 1, 3 and 5 are catalyzed by Niax catalyst A-107 and in columns 2, 4 and 6 by Niax catalyst A-400. The surfactant used in all formulations is Niax silicone surfactant Y-10366 (RS-171).

Indications:

- Niax catalyst A-400 delays the onset of the blowing reaction in a manner similar to the other delayed-action blow catalyst but, in all three formulations, Niax catalyst A-400 produces more open foam, as evidenced by the lower force-to-crush values.
- The force-to-crush reduction is 48% to 59% in the firmer cushion formulations and 64% in the softer seatback formulation.
- At the same time, the foams made with Niax catalyst A-400 have equally good stability and green strength, as illustrated by the hot ILD values.

**Table 1: Niax Catalyst A-400 Performance in TDI-Based Foams**

| Formulations                              | Parts by Wt |          |          |          |          |          |
|---|-------------|----------|----------|----------|----------|----------|
| Components                                | 1           | 2        | 3        | 4        | 5        | 6        |
| Polyether Polyol (OH# 36)                 | 25.00       | 25.00    | 50.00    | 50.00    | 75.00    | 75.00    |
| Polymer Polyol (OH# 22)                   | 75.00       | 75.00    | 50.00    | 50.00    | 25.00    | 25.00    |
| Diethanolamine                            | 1.50        | 1.50     | 1.50     | 1.50     | 1.50     | 1.50     |
| Water (total)                             | 4.00        | 4.00     | 4.00     | 4.00     | 4.00     | 4.00     |
| Niax Catalyst A-33                        | 0.35        | 0.35     | 0.35     | 0.35     | 0.35     | 0.35     |
| Niax Catalyst A-107                       | 0.20        | -        | 0.20     | -        | 0.20     | -        |
| Niax Catalyst A-400                       | -           | 0.26     | -        | 0.26     | -        | 0.26     |
| Niax Silicone Surfactant Y-10366 (RS-171) | 1.20        | 1.20     | 1.20     | 1.20     | 1.20     | 1.20     |
| TDI (80:20)                               | 45.50       | 45.50    | 46.00    | 46.00    | 46.50    | 46.50    |
| Isocyanate Index                          | 98          | 98       | 98       | 98       | 98       | 98       |
| <b>Foam Properties</b>                    |             |          |          |          |          |          |
| Density, pcf (kg/m <sup>3</sup> )         | 2.2 (35)    | 2.2 (35) | 2.2 (35) | 2.2 (35) | 2.2 (35) | 2.2 (35) |
| Cream Time, sec                           | 8           | 7        | 8        | 7        | 8        | 7        |
| Exit Time, sec                            | 30          | 30       | 30       | 30       | 30       | 30       |
| Weight, g                                 | 316         | 313      | 316      | 314      | 313      | 314      |
| FTC, N                                    | 933         | 487      | 775      | 321      | 501      | 181      |
| Hot ILD, N                                | 241         | 228      | 180      | 183      | 148      | 147      |

Table 2 shows formulations that typically are used in Europe.

Indications:

- Niax catalyst A-400 produces more open foam than the industrial standard delayed-action blow catalyst (Niax catalyst A-107) with equivalent stability (as illustrated by the vent collapse) and equivalent cure

**Table 2: Niax Catalyst A-400 Performance in TDI-Based Foams**

| Formulations                              | Parts by Wt |          |
|---|-------------|----------|
|   | 1           | 2        |
| Components                                |             |          |
| Polyether Polyol (OH# 36)                 | 67.00       | 67.00    |
| Polymer Polyol (OH# 30)                   | 33.00       | 33.00    |
| Water (total)                             | 4.00        | 4.00     |
| Diethanolamine                            | 1.50        | 1.50     |
| Niax Silicone Surfactant Y-10366 (RS-171) | 1.10        | 1.10     |
| Niax Catalyst A-33                        | 0.25        | 0.25     |
| Niax Catalyst A-107                       | -           | 0.20     |
| Niax Catalyst A-400                       | 0.26        | -        |
| Foam Properties <sup>(1, 2)</sup>         |             |          |
| Index 90                                  |             |          |
| Cream Time, sec                           | 6.5         | 6.5      |
| Exit Time, sec                            | 43-45       | 36-39    |
| Foam Weight, g                            | 509         | 507      |
| F.T.C., N                                 | 675         | 837      |
| Hot ILD, N                                | 96          | 98       |
| Foam Weight, g                            | 491         | 480      |
| F.T.C., N                                 | 549         | 745      |
| Hot ILD, N                                | 87          | 90       |
| Foam Weight, g                            | 479         | 474      |
| F.T.C., N                                 | 491         | 695      |
| Hot ILD, N                                | 85          | 89       |
| Index 105                                 |             |          |
| Vent collapse <sup>(3)</sup> , cm         | 0           | 0        |
| Exit Time, sec                            | 37          | 30       |
| Foam Weight, g                            | 408         | 376      |
| Index 100                                 |             |          |
| Density, pcf (kg/m <sup>3</sup> )         | 2.0 (32)    | 2.0 (32) |
| Cream Time, sec                           | 6.5         | 6.5      |
| Exit Time, sec                            | 45          | 38       |
| Foam Weight, g                            | 482         | 474      |
| F.T.C., N                                 | 549         | 803      |
| Hot ILD, N                                | 96          | 96       |
| Foam Weight, g                            | 478         | 478      |
| F.T.C., N                                 | 541         | 789      |
| Hot ILD, N                                | 97          | 96       |

- (1) F.T.C. is the force to indent at 50% an uncrushed cushion at 1 min. after demold.
- (2) Hot ILD is the force to indent at 50% a crushed cushion at 3 min. after demold.
- (3) Vent Collapse is measured using 4 x 1 mm vents.

Figure 1: Reduction in Force-to-Crush Properties Using Niax Catalyst A-400

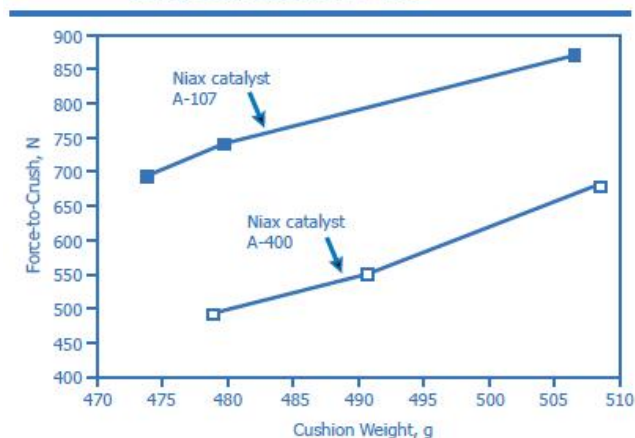


Figure 1 shows the significant reduction in force-to-crush with Niax catalyst A-400 as a function of foam part weight at 90 index.

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