



**M Chemical**

<b>DURAMAX P- 400</b>							
<b>Typical Properties</b>							
<b>Physical</b>	Water Absorption Max. Operating Temp. Sphericity Bulk Density Crush Strength  Hardness (Mohs scale) Acid Resistance			< 0.9% 1800 deg. F < 1.25 (d-max/d-min) 85-88 lbs/cuft › 95-3400 lbs (size correlation) › 8 › 98%			
<b>Chemical</b>	SiO <sub>2</sub> Al <sub>2</sub> O <sub>3</sub> TiO <sub>2</sub> Fe <sub>2</sub> O <sub>3</sub>			67.4% › 25% 0-2 % max. Less than 0.1% max.			
<b>Crush Strength by Size</b>							
<b>Size (nominal) – inches (mm)</b>	1/8 (3)	1/4 (6)	1/2 (13)	3/4 (19)	1.0 (25)	1.5 (37)	2.0 (50)
<b>Crush Strength – lbs</b>	94	205	600	1205	1766	2100	› 3300
<b>Availability</b>	Shipping Point  Packaging				Los Angeles, CA and Houston, TX  25 cuft Supersacks 20 cuft Supersacks 1 cuft Boxes		
<b>Application</b>	Used as catalyst and adsorbent bed support in refining, petrochemical and gas processing applications.						
<p align="center"><b>M Chemical Company- (323) 254-3600; fax (323) 257-6968</b></p>							

# **Quality Control Performance Tests done on Duramax inert support material:**

DURAMAX P-400 ceramic support series are all purpose support material for use in refinery, chemical, and gas plants where ceramic support utilization is acceptable. It is available in wide variety of sizes from 2 inch down to 1/8 inch. Specialty sizes can be produced per request. DURAMAX series of support media are available in spherical ball forms and by request in tabular forms. Three main characteristics sets the products apart from other vendors; 1) Uniform spherical shape allowing for high stress distribution ability 2) High crush strength 3) Withstands high pressure shock test.

DURAMAX support material can withstand even the most demanding process conditions. DURAMAX support media can withstand the combined effects of load, temperature and depressurization without chipping, spalling or breaking. These industry accepted tests are designed to mirror process conditions that tend to challenge the integrity of the support spheres.

**1) Drop Test:** Installing support material in a vessel or reactor can cause extreme stress on a support ball. The support media can be dropped as much as 25 feet into the reactor. Loading with a sock lessens the impact the impact somewhat, but the potential for breakage still exists. The broken support media can increase pressure drop due to channeling and catalyst bed plugging.

#### **Drop Test Method:**

Fifty samples of each size were dropped 25 feet through a pipe onto a steel plate with an 18-inch free fall from the bottom of the pipe to the plate. 100% of the Duramax support balls pass this test.

**2) Thermal Shock:** Even gradual changes in temperature, whether moderate or extreme, can weaken support balls. Process conditions common in fixed-bed catalytic applications can weaken the supports over time and make them increasingly susceptible to breakage or chipping.

#### **Thermal Shock Test Method:**

30 sample spheres of each media are heated to 800 deg. F, then dropped into water at room temperature. The test was then repeated at 1500 deg F. 100% of the Duramax support material survive this test without any visual signs of physical failure; including fracture, cracking, chipping and spalling.

**3) Rapid Depressurization:** An extreme rapid drop in pressure can cause a weaker support ball to shatter, potentially causing performance issues with the unit.

#### **Rapid Depressurization Test Procedure:**

Approximately 200 samples of various size support balls are heated in an autoclave to 850 deg. F and pressurized under hydrogen to 1500 psia in the autoclave chamber. The chamber was then depressurized instantaneously to ambient pressure. 100% of the Duramax support media survived this test without showing any visual signs of physical failure; including fracture, cracking, chipping and spalling and no loss of crush strength.