

## Megatran<sup>®</sup> 240 Dry-Brite Products

A series of bench and floor test evaluations across a temperature and humidity matrix was undertaken to determine the performance characteristics of **leading dry-brite floor finish products**.

Dry-Brite products are designed to provide a high gloss, very durable floor finish that minimize floor maintenance requirements.

They are increasingly becoming the products of choice for end users due to the significant potential savings available by extending the useful life of the finish and reducing labor costs.

The application testing was designed to quantify the application and performance properties under end use conditions.

The testing will include the following environmental parameters:

- High Temperature / High Humidity 90°F / 88%RH
- High Temperature / Low Humidity 90°F / 30%RH
- Middle Temperature / High Humidity 70°F / 85%RH
- Middle Temperature / Low Humidity 70°F / 30%RH
- Low Temperature / High Humidity 50°F / 80%RH
- Low Temperature / Low Humidity 50°F / 30%RH

### Tests Conducted:

- A. ASTM bench test
- B. Stress recoat testing in the laboratory
- C. Floor tests

### Materials:

1. Interpolymer's formulation F-41-25-01, based on patented Megatran 240, 25% solids
2. National Brand Dry-Brite floor finish, 25% solids
3. Competitive polymer and recommended formulation for dry-brite applications, 25% solids

### Bench Test & Stress Recoat Results:

The above listed finishes were evaluated with the following procedures and conditions:

- The finishes were applied at the rate of 2 ml per half of a 12" x 12" tile, for a total of five coats.
- Multiple coats of finishes were applied to black vinyl and black vinyl composition tiles at 30-minute intervals.
- Tack was evaluated at 10-minute interval by placing an angled aluminum tester with a 1 kg weight to the freshly coated finish. After a 10-second dwell time, the weight was removed. If the tester fell over, the coating was considered to be tack-free.
- Tack was evaluated at every coat and noted.
- The air temperature and relative humidity are indicated in the following series of tables. The tiles were aged for 24 hours at each condition to equilibrate before coating.

### A. Bench Test Results

TEST SAMPLES	MEGATRAN 240 F-41-25-01	NATIONAL BRAND DRY BRITE FLOOR FINISH	COMPETITIVE DRY BRITE POLYMER & RECOMMENDED FORMULATION
60° SPECULAR GLOSS ASTM D1455	44	44	45
5 Coats on BVT ASTM D1436	25,58,80,87,90	27,57,84,88,90	25,55,83,88,90
RUBBER HEEL MARK RESISTANCE ASTM D3714	Excellent 1.01	Very Good 1.03	Very Good 1.03
POWDER RESISTANCE ASTM D2048	Excellent	Excellent	Excellent
CRAZING	None	None	None
LEVELING ASTM D1436	Excellent	Good	Very Good
RECOATABILITY Initial ASTM D3153 Final	Very Good Excellent	Good Good	Very Good Very Good
WATER SPOT RESISTANCE ASTMD1793 Initial Final	Very Good Excellent	Excellent Excellent	Very Good Excellent
DETERGENT RESISTANCE ASTM D3207	Excellent	Excellent	Excellent
REMOVABILITY ASTM D1792	Good	Good	Good
SLIP INDEX ASTM D2047	0.56	0.54	0.56
PENCIL HARDNESS** ASTM D3363 on glass plate	3H	2H	3H
SOLIDS ASTM D2834	24.9	24.7	24.9
VISCOSITY (cps) LVF @ 22°C	8.0	9.0	8.0
SWARD ROCKER HARDNESS ASTM D2134	28	26	25
pH ASTM E70	8.7	8.8	8.7

\*\*Pencil Hardness Scale

6B-5B-4B-3B-2B-B-HB-F-H-2H-3H-4H-5H-6H

## B. Tack and Haze Test Results

### High Temperature / High Humidity - 90° F/ 88% RH

	Haze	10 Min. Tack	20 Min. Tack	30 Min. Tack
<b>F-41-25-01</b>	Yes on 4 <sup>th</sup>	Wet	Moderate on 3 <sup>rd</sup>	Moderate on 4 <sup>th</sup>
<b>National Brand</b>	Yes on 2 <sup>nd</sup>	Wet	Severe on 3 <sup>rd</sup>	Moderate on 3 <sup>rd</sup>
<b>Competitive Product</b>	Yes on 3 <sup>rd</sup>	Wet	Severe on 3 <sup>rd</sup>	Moderate on 3 <sup>rd</sup>

### High Temperature / Low Humidity - 90° F/ 30% RH

	Haze	10 Min. Tack	20 Min. Tack	30 Min. Tack
<b>F-41-25-01</b>	None	None	None	None
<b>National Brand</b>	None	None	None	None
<b>Competitive Product</b>	None	None	None	None

### Middle Temperature / Low Humidity - 70° F/ 30% RH

	Haze	10 Min. Tack	20 Min. Tack	30 Min. Tack
<b>F-41-25-01</b>	None	None	None	None
<b>National Brand</b>	None	None	None	None
<b>Competitive Product</b>	None	None	None	None

### Middle Temperature / High Humidity - 70° F/ 85% RH

	Haze	10 Min. Tack	20 Min. Tack	30 Min. Tack
<b>F-41-25-01</b>	Yes on 4 <sup>th</sup>	Wet	Moderate on 5 <sup>th</sup>	Very Slight on 4 <sup>th</sup>
<b>National Brand</b>	Yes on 2 <sup>nd</sup>	Wet	Moderate on 3 <sup>rd</sup>	Slight on 3 <sup>rd</sup>
<b>Competitive Product</b>	Yes on 3 <sup>rd</sup>	Wet	Moderate on 3 <sup>rd</sup>	Slight on 3 <sup>rd</sup>

### Low Temperature/ High Humidity - 50° F/ 80% RH

	Haze	10 Min. Tack	20 Min. Tack	30 Min. Tack
<b>F-41-25-01</b>	Yes on 5 <sup>th</sup>	Wet	Moderate on 3 <sup>rd</sup>	Very Slight on 4 <sup>th</sup>
<b>National Brand</b>	Yes on 3 <sup>rd</sup>	Wet	Moderate on 2 <sup>nd</sup>	Slight on 3 <sup>rd</sup>
<b>Competitive product</b>	Yes on 3 <sup>rd</sup>	Wet	Moderate on 2 <sup>nd</sup>	Slight on 3 <sup>rd</sup>

### Low Temperature/ Low Humidity - 50° F/ 30% RH

	Haze	10 Min. Tack	20 Min. Tack	30 Min. Tack
<b>F-41-25-01</b>	None	Slight on 3 <sup>rd</sup>	None	None
<b>National Brand</b>	None	Moderate on 2 <sup>nd</sup>	Slight on 3 <sup>rd</sup>	Slight on 4 <sup>th</sup>
<b>Competitive Product</b>	None	Moderate on 3 <sup>rd</sup>	None	None

## C. FLOOR TEST

### PURPOSE:

A floor test was conducted to compare application properties of the floor finishes listed under extreme environmental conditions.

### MATERIALS TESTED :

1. Interpolymer's formulation F-41-25-01 based on Megatran 240
2. National Brand
3. Competitive Product

### FLOOR TEST PARAMETERS:

**Location:** Test floor at Interpolymer Corporation in Canton, MA  
**Duration of Test:** 72 hours  
**Flooring:** 12" x 12" Black vinyl composition tiles  
12" x 12" White vinyl composition tiles  
12" x 12" Black solid vinyl tiles

**Floor Preparation:** The floor was machine stripped with a commercial stripper and rinsed twice with water using a mop and pail.

**Application of Finish:** Multiple coats of each finish were applied to the floor at a rate of 1000 to 1500 ft<sup>2</sup>/gallon using a Great White nylon mop (size large) and allowing sufficient drying time between coats. If the finish failed due to recoat problems, no further coats were applied. The first test was performed at atmospheric conditions of 87°F and relative humidity of 85% with poor air circulation. The second test was conducted at 68°F and relative humidity of 80%.

**Test Results:** The suggestions and data are based on information we believe to be reliable. They are offered in good faith, but without guarantee, as conditions and methods of our products are beyond our control. We recommend the prospective user determine the suitability of our materials and suggestions before adopting them for commercial use. It is the buyer's responsibility to determine suitability of the above formulation through quality control and field testing. Suggestions for use of our products should not be understood as recommendations that they be used in violation of any existing or pending patents.

**TEST RESULTS AND OBSERVATIONS:  
 High Temp / High Relative Humidity: 87°F / 85%RH**

Coats	60° Specular Gloss (Measurements taken on vinyl composition tiles)			Time Between Coats (Minutes)
	Megatran 240 F-41-25-01	National Brand	Competitive Product	
0	3	3	3	35
1	25	24	23	38
2	60	57	55	42
3	70	68 (recoat)	73	44
4	82	-	83	45
5	88	-	85 (recoat)	45
6	90	-	-	
7	-	-	-	

**TEST RESULTS AND OBSERVATIONS:  
 Moderate Temperature / High Relative Humidity (68° / 80%RH):**

Coats	60° Specular Gloss (Measurements taken on vinyl composition tiles)			Time Between Coats (Minutes)
	Megatran 240 F-41-25-01	National Brand	Competitive Product	
0	3	3	3	35
1	27	28	27	38
2	60	61	52	42
3	74	75	73	44
4	85	80 (recoat)	-	-

The testing at the lower temperature and higher humidity was extremely adverse since the drying time required 5-15 minutes longer than expected for each application. The procedure is to apply coats until recoat failure, haze or other unacceptable floor finish performance is observed.

At 68°F and 80% relative humidity there were some recoat issues visible on the 3<sup>rd</sup> coat of the national brand and on the competitive product. Interpolymer's F-41-20-01 showed some recoat on the 5<sup>th</sup> application. These results allow the manufacturer to inform the applicator what to expect under high humidity conditions and how to avoid potential recoat issues by limiting the number of coats or increasing time between applications.

Formulation modifications will and can alleviate some of the recoat problems, however, there will always be extreme environmental conditions under which floor finishes cannot be applied properly. Formulation adjustments to compensate for environmental conditions may subsequently affect other performance characteristics such as durability and gloss, and should consequently only be made after careful consideration.

**Recommendations and Observations:**

The results exhibit that the suggested formulation, F-41-25-01 based on the Megatran 240 acrylic polymer offers the end user an excellent starting point for a high performance dry-brite floor finish suitable for rigorous environmental conditions. When compared to a leading national brand and a competitive polymer and formulation specified for dry-brite use under these test and environmental conditions, Megatran 240 offers significant cost/performance advantages.

Megatran 240 and other patented Megatran water based acrylic polymers have been specifically designed to provide the formulator high quality, consistent and reliable performance for the I&I floor care market.

**DRY BRIGHT FLOOR FINISH BASED ON MEGATRAN® 240**

Formulation F-41-25-01 @ 25% N.V.

*Mix in Order Listed:*

	<u>Pounds</u>	<u>Weight %</u>
Water	278.44	32.38
Bactericide	Q.S.	Q.S.
Premixed Plasticizers:		
Tributoxyethyl Phosphate	27.50	3.20
Diethylene Glycol Ethyl Ether (low gravity)	50.00	5.81
1% Active Zonyl FSO or 1% Masurf FS230	5.00	0.58
TXIB	6.25	0.73
<b>MEGATRAN 240 @ 38% N.V.</b>	<b>468.75</b>	<b>54.51</b>
<b>SYNTRAN 6160 @ 40% N.V.</b>	<b>11.72</b>	<b>1.36</b>
<b>SYNTRAN PA-1465 @ 38% N.V.</b>	<b>12.34</b>	<b>1.43</b>
Defoamers	Q.S.	Q.S.
YIELD:	<u>860.00</u>	<u>100.00%</u>

pH: 8.6 ± 0.2

Polymer/Resin/Wax Ratio: 95 / 0 / 5