



4119 White Bear Parkway, St. Paul, MN 55110 USA  
 Phone (651) 429-1100, Fax (651) 429-1122  
 Toll Free (800) 4-CORTEC, E-mail info@cortecvci.com  
 Internet http://www.cortecvci.com

## *Evaluating Utility Box Dividers Made with Various Amounts of Cortec M-121 PP Masterbatch*

**Background:** Cortec M-121PP Masterbatch has been used recently by Gander Mountain in a new series of utility boxes. Plano Molding Company is now interested in using Cortec masterbatch. They have sent utility box dividers containing various amounts of Cortec M-121PP masterbatch, as well as dividers made by Flambeau using Zerust masterbatch. An evaluation of the corrosion inhibiting ability of these dividers is sought.

**Purpose:** Evaluate the corrosion inhibiting ability of tackle box dividers made by Gander Mountain and Plano Molding (containing various amounts of Cortec M-121PP masterbatch), as well as Flambeau, Inc. (which contains Zerust masterbatch).

**Method:** German VIA Test (Federal Standard 101C, Method 4031, Procedure B)

**Materials:**  
 -VIA Test Kit  
 -7 Plano Molding Company Utility Boxes, labeled 'AA' through 'GG', provided by Plano Molding Company  
 -Gander Mountain Utility Box, provided by Plano Molding Company  
 -Flambeau, Inc. Tackle Box, provided by Plano Molding Company

**Procedure:** The following procedure was followed:

- 1) All the utility boxes arrived and were inspected.
- 2) Each box contained 15 or 16 divider chips.
- 3) VIA tests were performed using 5 divider chips per jar.
  - a. Note: 6 chips per jar would satisfy the VIA work instruction, according to the amount of PE film used.
- 4) Testing was run on Gander Mountain and Flambeau divider chips first.
- 5) Plano Molding divider chips were run last.
- 6) Divider chips contained the following amounts of masterbatch:
  - a. Gander Mountain – 15% Cortec M-121PP
  - b. Flambeau – Unknown, using Zerust masterbatch
  - c. Plano 'AA' – 10% M-121PP
  - d. Plano 'BB' – 15% M-121PP
  - e. Plano 'CC' – 5% M-121PP
  - f. Plano 'DD' – 20% M-121PP
  - g. Plano 'EE' – 15% 'Inhibitor' brand
  - h. Plano 'FF' – 20% 'Inhibitor' brand
  - i. Plano 'GG' – Unknown

**Results:** The following results were found:

	Plug #1	Plug #2	Plug #3
<b>Gander Mountain</b>	Grade 3	Grade 3	Grade 2
<b>Flambeau</b>	Grade 1	Grade 1	Grade 1
<b>Plano 'AA'</b>	Grade 2	Grade 2	Grade 1
<b>Plano 'BB'</b>	Grade 3	Grade 3	Grade 2



<b>Plano 'CC'</b>	Grade 1	Grade 2	Grade 1
<b>Plano 'DD'</b>	Grade 2	Grade 2	Grade 3
<b>Plano 'EE'</b>	Grade 3	Grade 3	Grade 3
<b>Plano 'FF'</b>	Grade 2	Grade 3	Grade 2
<b>Plano 'GG'</b>	Grade 2	Grade 3	Grade 2
<b>Control</b>	Grade 0	N/A	N/A

**Note:** VIA Test Grades are explained below.

**Conclusion:** A wide range of results were found during VIA testing. The divider chips from Flambeau failed to provide adequate corrosion protection. The pieces from the Gander Mountain boxes provided very good corrosion protection. These chips contained a known amount of M-121PP (15%). Plano divider chips from box 'AA' showed the worst results of their group, which was to be expected, as they contained only 10% M-121PP. The 'BB' box performed extremely well, while 'CC' showed two great results and one poor result. Box 'DD' passed the test, and Box 'EE' was the best of the group, with no corrosion present on any of the plugs. 'FF' and 'GG' showed good results as well, with a few tiny spots of corrosion on two of the plugs in each group.

Note: the amount of masterbatch in the various divider chips was not known by Cortec prior to testing. Evaluating VpCI performance in polypropylene proved exceedingly difficult. The results of this project (along with project 06-148-1725) were inconsistent. VIA results were not consistent with the loading rate of the various products. The rate of VpCI emission from polypropylene is most likely slower than polyethylene, due to its rigid nature. This may be the cause of the inconsistent results.

**Project #:** 06-185-1325

**VIA Test Grades (Grades 2 and 3 are passing)**

- Grade 0: Blind test  
No corrosion inhibiting effect
- Grade 1: Blind test  
Minute corrosion inhibiting effect
- Grade 2: Blind test  
Medium corrosion inhibiting effect
- Grade 3: Blind test  
Good corrosion inhibiting effect

