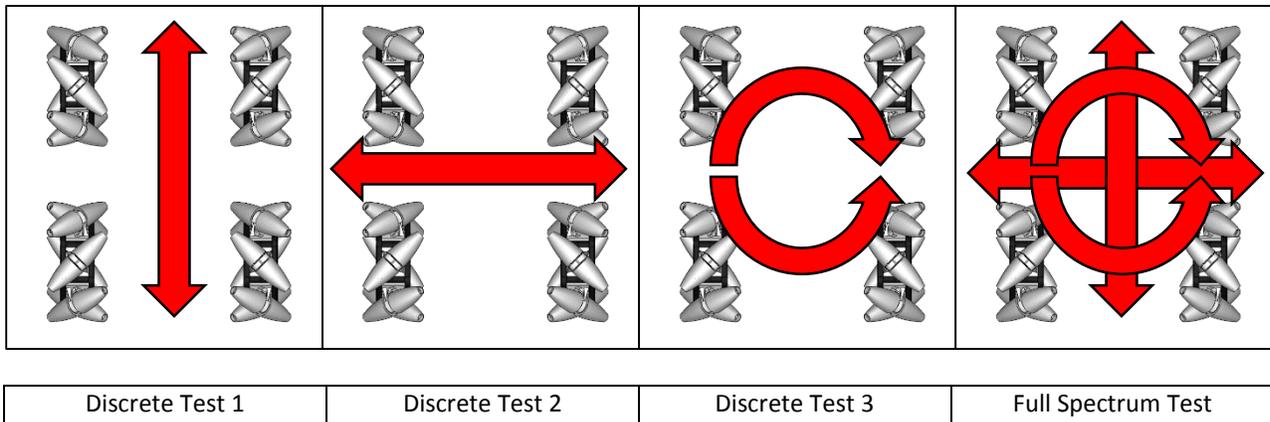


4" Mecanum Wheel Durability Testing (am-2538)

To prove the durability of a set of our AndyMark, 4" Mecanum wheels (am-2538), we wanted to share with you the testing that we conducted.

Load Test

The first test that we conducted was to load a test chassis up to and beyond normal FTC robot weights and evaluate the driving performance. The test chassis was built from AndyMark C-Channel, pg27 gearmotors (am-0912) and the Cheap & Dirty controls package (am-2493). We evaluated the system's driving performance in a variety of discrete trials and then a full spectrum test, all of which were driven on competition spec soft tiles (am-2499-36). The trials were driving in a straight line forward and reverse, driving in a straight line side-to-side, and finally, spinning the robot around its center point. The full spectrum test involved mixing the three discrete tests to simulate how a robot would drive in competition.



This chassis was first loaded to 45lbs total weight and driven through all of the tests. We found that at this weight the robot had full functionality in all four tests. The robot was able to accurately drive to any spot on the field at any orientation. Next, we added, 25lbs to the robot bringing its total weight to 70lbs. At this weight we saw a diminished strafing ability in test number two, but all other driving characteristics were unaffected.

Drop Test

For this series of tests we incrementally dropped the test chassis from ever increasing heights. Starting at 6" above the soft tiles and incrementing up 6" until we experienced failure of a component. During the inspection after the 36" drop test we found that the motor mount brackets began to bend and were, thus, the weak point in the test. Next we dropped the chassis onto the bare concrete floor. Again we started at 6" but incremented every 3". The 12" test was the first time that a roller support broke on impact. We repeated this test to increase the sample size and each time we dropped the robot we made sure that all four wheels were landing on intact rollers. We found that we were able to consistently break the roller spindle with a 12" drop onto concrete. This additional testing was done to ensure that the original failure was not due to a manufacturing error.

Conclusion

From these tests we determined that the wheels were durable and robust enough to withstand the rigors of a FTC season.