

Competitive Product Review

Gorilla vs. Gates Terminator

By: Jeff Dotson, Continental ContiTech AG
Mount Pleasant, Iowa Plant

BACKGROUND

A ½" ID and ¾" ID, GATES TERMINATOR hose sample was submitted by CONTITECH marketing. Benchmark testing was requested against CONTITECH GORILLA hose ½" 569-035-127 and ¾" 569-035-191.

PRODUCT ANALYSIS OF GATES TERMINATOR

PACKAGING

No packaging included with samples

HOSE

The GATES hose was branded: GATES TERMINATOR 501 psi (3.45 MPa) WP ½ INCH (12.7mm) Flame Resistant MSHA 2G-1C-11C MADE IN USA CS 060310 A3.

TUBE

The inner tube was black rubber, advertised as NBR compound (RMA Class A oil).

YARN

Reinforcing on ½" was 4-spiral construction, appeared to be polyester type.

Reinforcing on ¾" was 4-spiral construction, appeared to be aramid type.

COVER

The outer cover was yellow, advertised as carboxylated NBR (RMA Class A oil).

Advertised as approved MSHA flame rating.

FITTINGS

N/A

PRODUCT COMPARISON: GATES TERMINATOR TO CONTITECH GORILLA

HOSE PROPERTIES

The hoses used for comparison are ½” and ¾” ID. Test data for all hoses is shown in the attached spread sheet.

CONCLUSION/OBSERVATIONS

APPEARANCE

General appearance of the TERMINATOR hose was fair. Both TERMINATOR samples had brownish foreign material adhered to the outer cover (likely residual lube pickup from curing pans). TERMINATOR was noticeably much stiffer to bend than GORILLA hose.

FITTINGS/CRIMP

No fittings on samples.

CONSTRUCTION

TERMINATOR is 4-spiral reinforced. TERMINATOR ½” appeared to be a polyester fiber and the ¾” appeared to be aramid fiber. All GORILLA hose is 4-spiral aramid reinforced ¼” – 1 ½” ID.

TEST RESULTS

The sample hose was tested and compared to GORILLA. Tests showing significant differences are highlighted in yellow on the attachment.

SUMMARY

1. GORILLA hose is noticeably more flexible than TERMINATOR samples. A force to bend test (180 deg. Bend) was ran on TERMINATOR samples and compared to GORILLA hose.
GORILLA hose required significantly lower force to bend 180 deg.
2. Two separate burst tests were ran on the 3/8” **TERMINATOR** and both **failed to meet the RMA minimum 4:1 safety on burst** (need 2000 psi minimum).
3. Outer cover compound properties are somewhat better on GORILLA hose. Inner tube compound physical properties are somewhat better on TERMINATOR hose. All meet RMA class A oil resistance as advertised.
4. **GORILLA outer cover has better abrasion resistance** than TERMINATOR.
5. All pass hose resistivity tests for static non-conductivity as advertised.
6. **TERMINATOR outer cover did not pass the MSHA flame testing** on these samples.
7. Gates advertises TERMINATOR as 500 to 700 ft. reels on these sizes. CONTITECH GORILLA advertises 500 ft. exact length reels on these sizes.

Note: Test results are indicative of specific hose samples tested only.

Benchmark Testing ½” Gorilla Hose Gates Terminator vs 569-035-127 Gorilla

Product Type: ½” X 500 PSI WP Air/Multipurpose Hose

Branding on Competitive Hose: GATES TERMINATOR 501 psi (3.45 MPa) WP 1/2 INCH (12.7mm) Flame Resistant MSHA 2G-1C-11C MADE IN USA CS 060310 A3

Test Description	TERMINATOR Results		GORILLA Results	
	date code: 08 03 10		date code: 09 11 10A	
1. Color	<u>Yellow</u>		<u>Yellow</u>	
2. Basic Construction	<u>4-Spiral</u>		<u>4-Spiral</u>	
3. Compound/Material	<u>NBR Rubber</u>		<u>NBR Rubber</u>	
4. Working Pressure (as advertised)	<u>501 psi</u>		<u>500 psi</u>	
5. Burst Strength (psi)	<u>1863 psi</u>		<u>2139 psi</u>	
6. Temp. Range (as advertised)	<u>-40F to +212F</u>		<u>-20F to +190F</u>	
7. Inside Diameter (mm)	<u>13.2</u>		<u>13.0</u>	
Outside Diameter (mm)	<u>23.1</u>		<u>23.2</u>	
8. Adhesion:				
Tube to Yarn (N/inch)	<u>62</u>		<u>68</u>	
Cover to Yarn (N/inch)	<u>66</u>		<u>70</u>	
9. Ozone Resistance, 70 hrs @ 50 pphm	<u>No Cracks</u>		<u>No Cracks</u>	
10. Cold Flex, Whole Hose 24 hrs. @ -20C, bend around mandrel 10 X OD	<u>No Cracks</u>		<u>No Cracks</u>	
Compound Properties	<u>Tube</u>	<u>Cover</u>	<u>Tube</u>	<u>Cover</u>
11. Tensile Strength, Mpa* ASTM D622	<u>14.0</u>	<u>12.2</u>	<u>7.8</u>	<u>13.9</u>
Elongation %	<u>171</u>	<u>353</u>	<u>307</u>	<u>404</u>
Hardness, Shore A	<u>72</u>	<u>74</u>	<u>75</u>	<u>71</u>
12. Heat Age 70 hrs. @ 100C; ASTM D622				
Tensile, % chg	<u>+4</u>	<u>+6</u>	<u>+10</u>	<u>+23</u>
Elong., % chg.	<u>-12</u>	<u>-8</u>	<u>-20</u>	<u>-12</u>
Hardness Pts Chg.	<u>+6</u>	<u>+7</u>	<u>+9</u>	<u>+3</u>
13. Fluid Immersion IRM 903 Oil, 70hrs @ 100C; ASTM D622				
Tensile, % chg	<u>-18</u>	<u>0%</u>	<u>-5</u>	<u>+25</u>
Elong., % chg.	<u>-20</u>	<u>-55</u>	<u>-50</u>	<u>-24</u>
Volume Change %	<u>+20</u>	<u>+2</u>	<u>+18</u>	<u>-6</u>
14. Abrasion Resist., Cover: Volume loss g/Cu. mm	<u>NA</u>	<u>257</u>	<u>NA</u>	<u>141</u>
15. Flame test, cover, MSHA: No flame after 1 minute	<u>NA</u>	<u>Failed</u>	<u>NA</u>	<u>Passed</u>
16. Resistivity, minimum 1 megohm/inch @ 1000 V DC	<u>PASS</u>		<u>PASS</u>	
17. Flexibility, force to bend 12" pc. around 180 deg. Arc (lbs)	<u>17</u>		<u>10</u>	

Note: Yellow Highlighted sections denote areas of significant difference
Data is indicative only of samples tested
10/4/2010

Benchmark Testing 3/4" Gorilla Hose Gates Terminator vs 569-035-191 Gorilla

Product Type: 3/4" X 500 PSI WP Air/Multipurpose Hose

Branding on Competitive Hose: GATES TERMINATOR 501 psi (3.45 MPa) WP 3/4 INCH (19.0mm) Flame Resistant MSHA 2G-1C-11C MADE IN USA CS 022710 C3

Test Description	TERMINATOR Results		GORILLA Results	
	date code: 02 27 10		date code: 09 11 10A	
1. Color	<u>Yellow</u>		<u>Yellow</u>	
2. Basic Construction	<u>4-Spiral</u>		<u>4-Spiral</u>	
3. Compound/Material	<u>NBR Rubber</u>		<u>NBR Rubber</u>	
4. Working Pressure (as advertised)	<u>501 psi</u>		<u>500 psi</u>	
5. Burst Strength (psi)	<u>2235</u>		<u>2170 psi</u>	
6. Temp. Range (as advertised)	<u>-40F to +212F</u>		<u>-20F to +190F</u>	
7. Inside Diameter (mm)	<u>19.6</u>		<u>19.3</u>	
Outside Diameter (mm)	<u>31.2</u>		<u>30.2</u>	
8. Adhesion:				
Tube to Yarn (N/inch)	<u>109</u>		<u>43</u>	
Cover to Yarn (N/inch)	<u>79</u>		<u>60</u>	
9. Ozone Resistance, 70 hrs @ 50 pphm	<u>No Cracks</u>		<u>No Cracks</u>	
10. Cold Flex, Whole Hose				
24 hrs. @ -20C, bend around mandrel 10 X OD	<u>No Cracks</u>		<u>No Cracks</u>	
Compound Properties	<u>Tube</u>	<u>Cover</u>	<u>Tube</u>	<u>Cover</u>
11. Tensile Strength, Mpa* ASTM D622	<u>14.1</u>	<u>12.4</u>	<u>7.8</u>	<u>13.9</u>
Elongation %	<u>173</u>	<u>367</u>	<u>307</u>	<u>404</u>
Hardness, Shore A	<u>73</u>	<u>77</u>	<u>75</u>	<u>71</u>
12. Heat Age 70 hrs. @ 100C; ASTM D622				
Tensile, % chg	<u>+11</u>	<u>+0</u>	<u>+19</u>	<u>+23</u>
Elong., % chg.	<u>-17</u>	<u>-14</u>	<u>-29</u>	<u>-12</u>
Hardness Pts Chg.	<u>+7</u>	<u>+5</u>	<u>+9</u>	<u>+3</u>
13. Fluid Immersion				
IRM 903 Oil, 70hrs @ 100C; ASTM D622				
Tensile, % chg	<u>-18</u>	<u>-6%</u>	<u>-5</u>	<u>+25</u>
Elong., % chg.	<u>-20</u>	<u>-66</u>	<u>-50</u>	<u>-24</u>
Volume Change %	<u>+20</u>	<u>+3</u>	<u>+18</u>	<u>-6</u>
14. Abrasion Resist., Cover: Volume loss g/Cu. mm	<u>NA</u>	<u>287</u>	<u>NA</u>	<u>141</u>
15. Flame test, cover, MSHA: No flame after 1 minute	<u>NA</u>	<u>Failed</u>	<u>NA</u>	<u>Passed</u>
16. Resistivity, minimum 1 megohm/inch @ 1000 V DC	<u>PASS</u>		<u>PASS</u>	
17. Flexibility, force to bend 12" pc. around 180 deg. Arc (lbs)	<u>23</u>		<u>14</u>	

Note: Yellow Highlighted sections denote areas of significant difference
Data is indicative only of samples tested
10/4/2010