PRODUCT STANDARD

3420/3421

WIRELESS/AIRLESS

PAINT SPRAY HOSE

Changes:(N96-3240;3/18/96)(C97-4976;12/29/97)(C98-5666X;10/29/98)(C99-5943;1/13/99)(C99-6345;6/7/99)(C99-6366;6/14/99)(C99-6678;10/7/99)(C01-7439;2/19/01)(C01-7561;5/21/01)(C02-8247;8/26/02)(N03-9214;10/31/03)(C05-10173;3/14/05)

1.0 SCOPE:

This standard covers Synflex Wireless/Airless thermoplastic Paint Spray hose for use with paint, water base and synthetic coatings and adhesives within a temperature range of -40°F to 150°F (-40°C to 66°C). Operating temperatures or pressures in excess of those recommended in this standard may materially reduce the life of the hose. The fluids which may be carried in the hose are those which are compatible with nylon. This hose is electrically conductive and must be assembled using only the components and procedures described in this standard.

2.0 CONSTRUCTION:

Tube The tube is a smooth, seamless dual wall tube. The inside layer of the tube is nylon and the outside layer is a semi-conductive polymer.

Reinforcement The reinforcement is a synthetic fiber applied in the appropriate number of spiraled or braided plies. The reinforcing material is bonded to the tube.

Cover The hose cover is a smooth, seamless, polyether based polyurethane that is bonded to the reinforcement. The standard color is black, however other colors are available upon special request.

3.0 PRODUCT IDENTIFICATION:

The product is identified by marking that appears longitudinally on the cover of the product. The standard ink color is white. The text of the standard marking is shown in the following example; however private marking of the product is available upon special request. The 3421 hose series is private branded for a specific customer.

"**!Syntax Error, «**SYNFLEX® 3420-04 WIRELESS/AIRLESS PAINT SPRAY HOSE 1/4" WP 3300 PSI (228 BAR) DIE J04 EATO**N"**

In addition to the marking text the product is lot numbered for manufacturing traceability.

4.0 DIMENSIONS AND PRESSURES:

TABLE 1

Nom. I.D.	Hose Dash Size	Hose Dimensions		Min. Bend Radius	Max. Oper. Press.	Min. Burst Press.	Weight Per 100 Ft. (Lb.
		ID Nom.	OD Max.				
3/16"	-03	.200	.425	.75	3300	13,200	4.62
1/4"	-04	.261	.520	1.00	3300	13,200	6.20
3/8"	-06	.385	.730	2.50	3300	13,200	12.75

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5.0 QUALIFICATION TESTS:

To meet the qualification requirements for this hose standard, the hose and/or hose assemblies made using this hose and all applicable couplings shall conform to the following tests and requirements.

5.1 **Dimensional Test and Visual Examination:**

All hose shall conform to the dimensions detailed in Table 1 of this standard and all hose shall be visually examined per the latest issue of SAE J343.

5.2 **Proof Test:**

The hose or hose assembly shall show no indication of failure or leakage when pressurized to two times the working pressure listed in Table 1. This test shall be performed in accordance to the most current issue of SAE J343.

5.3 **Change in Length Test:**

The change in length shall not exceed ± 2% when tested per the latest issue of SAE J343.

5.4 **Burst Test:**

The hose shall not leak or fail at a pressure less than four times the working pressure listed in Table 1. This test shall be conducted in accordance to the latest issue of SAE J343.

5.5 **Leakage Test:**

The hose or hose assembly shall show no signs of leakage or failure when pressurized to 2.8 times the working pressure listed in Table 1. This test shall be conducted in accordance to the latest issue of SAE J343.

5.6 **Cold Flex Test:**

The hose shall show no indication of cover cracks or leakage when tested at -40°F (-40°C) in accordance with the latest issue of SAE J343.

5.7 **Oil Resistance Test:**

A sample of hose tube and cover material shall be tested according to the latest issue of SAE J343. The change in volume of the test specimen shall be between -15% and +35% after 70 hours immersion at 212°F (100°C).

5.8 **Ozone Resistance Test:**

A sample of hose tube and cover material shall be tested according to the latest issue of SAE J343. After exposure to an air/ozone mixture for 70 hours with ozone at a partial pressure of 50 MPa there shall be no evidence of cracking or deterioration when viewed with a seven-power magnification while still in the stressed position.

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5.9 **Impulse Test:**

Hose assemblies, when tested at 133% of working pressure, with 150°F (66°C) circulating Texaco Regal R&O 46 test fluid, shall withstand a minimum of 200,000 flex impulse cycles per Synflex Test Procedure TP-113 without leakage or failure and shall not exceed the specified maximum assembly resistance shown in Table 4.

5.10 **Resistance Check:**

At 350 volts DC (sufficient voltage to eliminate the contact resistance) the resistance of all unused hose assemblies shall not exceed the resistance specified in Table 4.

6.0 INSPECTION TESTS:

The following tests are to be performed on samples representing each production lot of hose. A production lot is defined as one shifts' production (8-12 hrs). Requirements shall be the same as the corresponding qualification tests:

1. Dimensional Test and Visual Examination per SAE J343.
2. Proof Test per SAE J343.
3. Change in Length Test per SAE J343.
4. Burst Test per SAE J343.

Changes:(N96-3240;3/18/96)(C97-4976;12/29/97)(C98-5666X;10/29/98)(C99-5943;1/13/99)(C99-6345;6/7/99)(C99-6366;6/14/99)(C99-6678;10/7/99)(C01-7439;2/19/01)(C01-7561;5/21/01)(C02-8247;8/26/02)(N03-9214;10/31/03)(C05-10173;3/14/05)

7.0 VOLUMETRIC EXPANSION:

The volumetric expansion of Synflex 3420 series hose is shown in Chart 1. The curves are based on limited testing of each hose size according to the latest issue of SAE J343.

3420 VOLUMETRIC EXPANSION

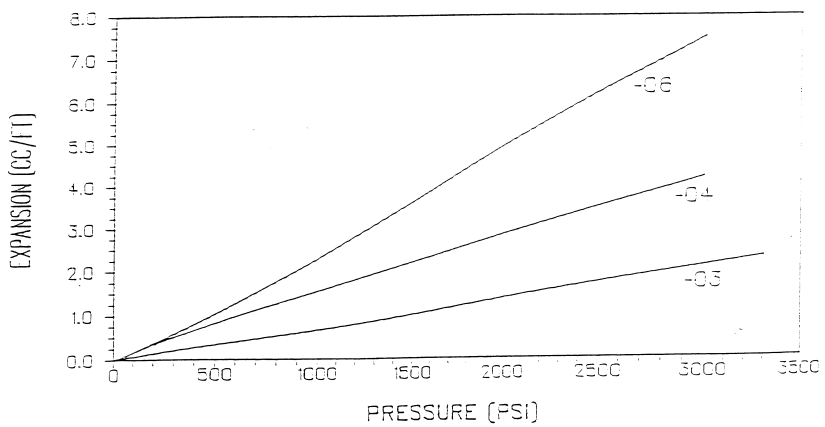

Chart 1

8.0 HOSE ASSEMBLY INFORMATION:

Synflex 3420/3421 series Hose **MUST** be used only with approved Synflex couplings and assembly equipment listed in Tables 2, 3, 5 and 6:

8.1 Swaged Couplings:

8.1.1 Swaged Coupling Information:

TABLE 2 - Swaged Couplings

Nom. I.D.	Hose Dash Size	Coupling* Part Number	Die** Part Number	Insert Depth	Swage Dia. ±.005	Bell Length ±.030
3/16"	-03	3903-03XXX	# 4540-J0300-001	# .665	# .479	# .787
1/4"	-04	3903-04XXX	4540-J0400	1.09	.571	.788

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3/8"	-06	390H-06XXX	4540-J06N0	1.20	.752	.745

TABLE 3 - Swaged Couplings

Nom. I.D.	Conductive Ferrule Part Number	Spring Guard Part Number	Warning Tag Part Number
3/16	45J0-04212	4521-AR004	0112-23158
1/4	45J0-04209	4521-91005	0112-23158
3/8	45J0-04211	4521-AE005	0112-23158

8.2 Hose Assembly Procedure:

All hose assemblies are to be made according to the instructions described below.

Step No. 1 Measure and cut hose to required lengths, **never exceed 500 feet (150 meters) overall combined length**. An oil free, clean square cut is essential. Install the warning tag, (See Table No. 3) for 3420.

Step No. 2 Place spring guards on **BOTH** ends of the hose. Install the end with the most closed coils towards the hose end. (Note: For 3420-06, also place spring guard retainer, shown in Table 4, over the ends of the spring guards with the smallest I.D. of the retainer toward the hose end). Mark the hose ends with the proper insertion depth. (See Tables 2 & 4).

Step No. 3 Slip the conductive ferrule over the coupling insert, then assemble hose and coupling pushing the hose into the proper insertion depth.

Step No. 4 Swage the coupling on the hose using the specified die and pusher. First making sure that the hose is pushed securely into the coupling to the correct insertion depth to ensure proper contact. Check swage diameter and bell length. (See Table 2).

Step No. 5 Twist the spring guard on the 3903 couplings up to the bell. For 3420-06, a spring guard retainer collar is required and must be crimped in place. Any standard eight (8) segment coupling crimp machine may be used to crimp the guard and retainer assembly to the diameter shown in Table 4. Or, see Section 8.3 for crimp tooling and procedure using Synflex power swager.

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TABLE 4

Nom. I.D.	Spring Guard Part Number	Spring Guard Retainer Part Number	Retainer Crimp Diameter
3/8"	4521-AE005	45J0-00407 or	.996 ± .017
		45J0-00409	1.045 ± .010

Step No. 6 Check assembly electrical resistance, **The Electrical resistance of this hose assembly must not exceed 29 megohoms.** Never exceed 500 feet (150 meters) overall combined length.
(See Table 5).

TABLE 5

Nom. I.D.	Max. Resistance Megohm/100'	Max. Resistance for New Assemblies 5 Ft. Long or Less Kilohms
3/16"	6	300
1/4"	4	200
3/8"	3.5	175

8.3 Factory Crimped Couplings:

8.3.1 Factory Crimped Coupling Information:

TABLE 6 - Factory Crimped Couplings

Nom. I.D.	Hose Dash Size	Coupling Part Number	Conductive Ferrule Part No.	Spring Guard Part No.	Warning Tag Part No.

Changes:(N96-3240;3/18/96)(C97-4976;12/29/97)(C98-5666X;10/29/98)(C99-5943;1/13/99)(C99-6345;6/7/99)(C99-6366;6/14/99)(C99-6678;10/7/99)(C01-7439;2/19/01)(C01-7561;5/21/01)(C02-8247;8/26/02)(N03-9214;10/31/03)(C05-10173;3/14/05)

3/16"	-03	5903-03XXX	45J0-04212	4521-AA004	0112-23158
1/4"	-04	5903-04XXX	45J0-04213	4521-AB005	0112-23158
3/8"	-06	Not available	----------	----------	----------

TABLE 7 - Factory Crimped Couplings

Nom. I.D.	Hose Dash Size	Coupling Part Number	Crimp Dia.	Dia. Over Crimp Ribs +/- .008	Crimp Length +/- .015	Min. Thru Hole
3/16"	-03	5903-03XXX	.430/.442	.482	.700	.090
1/4"	-04	5903-04XXX	.526/.540	.555	.700	.120
3/8"	-06	Not avail.	---------	---------	-----	----

* The last three digits of the coupling part number describe the end style of the coupling and are found in the Synflex Sales Catalog. The 5903 Style coupling is a plated steel coupling, other materials are available and are listed in the Synflex Sales Catalog. For special coupling materials and configurations not listed in the catalog contact Synflex Engineering.

8.3.2 Crimped 5903 Couplings:

The correct method for making hose assemblies with 5903 couplings is described below:

8.3.2.1 Measure and cut hose to required lengths, **never exceed 500 feet (150 meters) overall combined length**. An oil free, clean square cut is essential. Install the warning tag, (See Table No. 6) for 5903.

8.3.2.2 Place spring guards on **BOTH** ends of the hose. Install the end with the most closed coils towards the hose end. (See Table 6)

8.3.2.3 Set-up hose crimper to provide correct crimp dimensions (Table 7).

8.3.2.4 Slip the conductive ferrule over the coupling insert, then assemble hose by pushing the hose into the coupling, bottoming the hose in the coupling.

8.3.2.5 Crimp the coupling per manufacturing instructions after making sure the hose is securely bottomed in the coupling.

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8.3.2.6 Twist the spring guard up on the couplings skirt.

8.3.2.7 Check assembly electrical resistance, **The Electrical resistance of this hose assembly must not exceed 29 meg ohms**. Never exceed 500 feet (150 meters) overall combined length. (See Table 8)

TABLE 8

Nom. I.D.	Max. Resistance Megohm/100'	Max. Resistance for New Assemblies 5 Ft. Long or Less Kilogms
3/16	6	300
1/4	4	200
3/8		

8.4 Spring Guard Retainer Crimping Procedure using SYNFLEX Swager:

Tooling	-06 Size	-08 Size
Die Base	45J0-02012	45J0-02012
Pusher Plate	45J0-02022	45J0-02023
Crimp Fingers	45J0-02015 (T400-64)	45J0-02016 (T400-5)
Pusher	4599-MP016	4599-MP016
Swager	Any Synflex Power Swager	

Step No. 1 When using Synflex Mark IX 4540-009SX or Super V 4540-005S3 swagers, remove die holder brackets to avoid interference with die base. (See Drawing No. 1)

Step No. 2 Lightly oil inside of die base 45J0-02012 using any good grade of lube oil.

Step No. 3 Place correct crimp fingers for the 06 or 08 size assembly in die base 45J0-02012, then place die base in swager die bowl.

Step No. 4 Place correct pusher plate for the 06 or 08 size assembly over crimp fingers in die base.

Step No. 5 Install 4599-MP016 pusher in swager

Step No. 6 Holding the spring guard, insert coupling into crimp fingers from the bottom, continue until coupling reaches the maximum depth within the pusher plate.

Step No. 7 When coupling makes contact with the pusher plate, activate swager to bottom pusher plate against die base.

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Step No. 8 Reverse swager and remove hose/spring guard assembly.

Step No. 9 Verify that the retainer is crimped to proper dimensions given in Table 4.

8.5 Inspection of Hose Assembly Before Use:

WARNING:

SAFETY PRECAUTIONS

FOR SYNFLEX HOSE ASSEMBLIES

YOUR PERSONAL SAFETY MAY DIRECTLY OR INDIRECTLY BE AFFECTED IF THE HOSE ASSEMBLY HAS BEEN ABUSED

The following **WARNINGS** pertain to the more common abuses of this hose and hose assemblies.

1. **INSPECT** the hose assembly before each use.
2. **REPLACE** the hose assembly immediately if:
   A. The jacket of the hose appears abnormal.
   B. You have reason to believe it maybe abnormal.
   C. There is any fluid leakage.
   D. The couplings are damaged.
   E. The hose is damaged.
   F. The reinforcement is visible through the jacket.
3. DO NOT **EXCEED** the maximum recommended working pressure of the hose.
4. DO NOT **KINK** the hose assembly.
5. DO NOT **BEND** the hose assembly beyond its minimum recommended bend radius.
6. DO NOT **EXPOSE** to temperatures in excess of the maximum temperature rating of the hose or the fluid being convoyed.
7. DO NOT USE AS A **STRENGTH MEMBER** for pulling or lifting equipment.
8. DO NOT EXPOSE HOSE TO **FLUIDS** other than those outlined in the Synflex Chemical Resistance Chart or specifically approved by Synflex Engineering.
9. Use ONLY Synflex **COUPLINGS**.

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10. Use ONLY **ASSEMBLY EQUIPMENT** and procedures approved by Synflex.

11. Check the electrical resistance of the total coupled length of this hose assembly.
    A. **The Electrical resistance of this hose assembly must not exceed 29 meg ohms**.
    B. Never exceed 500 feet (150 meters) overall combined length.

12. This hose assembly is designed to convey static electricity. **It is imperative that this hose assembly be properly grounded** to the airless paint spray unit or other spray unit which it is attached according to the methods of recommended by the manufacturer of such units.

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9.0 REFERENCED TEST PROCEDURES:

This standard uses the following Test Procedures and Standards in whole or in part for evaluation of the product.

SAE J517	Hydraulic Hose
SAE J343	Tests and Procedures for 100R Series Hydraulic Hose and Hose Assemblies.
ASTM D-380	Standard Methods of Testing Rubber Hose.
ASTM D-622	Standard Methods of Testing Rubber Hose for Automotive Air and Vacuum Brake System.
TP-113	SYNFLEX Test Procedure

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