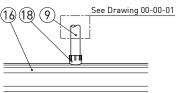
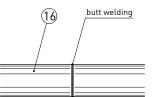
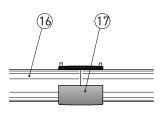
CAUTION

Assembly of anchorage and installation of tendons shall only be performed by qualified post-tensioning specialist personnel.

This installation procedure is generic: follow the specific procedure for each project and the FDoT specifications.







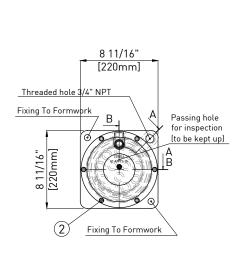
w/ welded port

butt welding

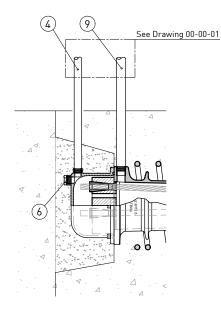
electrofused

INTERMEDIATE COUPLING DETAILS

see installation procedures

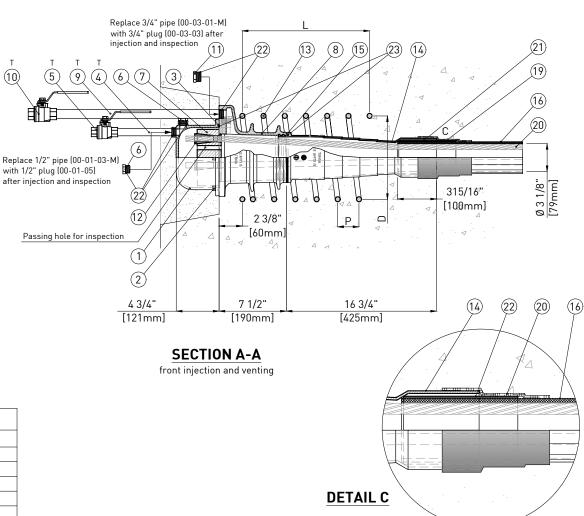






SECTION B-B top injection and venting

		E	BILL OF MATERIALS
ITEM	PART #	DESCRIPTION	MATERIAL
1	12-01-00	Protection Cap	Nylon S-PA0401 - according to ASTM D5989
2	12-01-01	Protection Cap Bolts	Stainless Steel GR316L - according to ASTM F593
3	12-01-02	Protection Cap O-Ring	NBR - according to FDoT Tab.2.2.1.7-1 Sec.960
4	00-01-03-M	NPT Pipe Nipple 1/2"	SCH40 steel
5	00-01-04-M	NPT Ball Valve 1/2"	SCH40 steel
6	00-01-05	NPT Plug 1/2"	High Density Polyethylene - according to ASTM D3350
7	E-IU-12-02-00	Wedge Plate	Steel AISI C1045 Normalized
8	12-03-00	Anchor	Ductil Iron ASTM A536 GR80-55-06 + Galvanization according to ASTM A123
9	00-03-01-M	NPT Pipe Nipple 3/4"	SCH40 steel
10	00-03-02-M	NPT Ball Valve 3/4"	SCH40 steel
11	00-03-03	NPT Plug 3/4"	High Density Polyethylene - according to ASTM D3350
12	00-04-00	Wedges	Steel AISI 12L14 - according to ASTM A108 + Heat treatment
13	12-05-00	Spiral	Steel GR60, #4 - according to ASTM A615
14	12-06-00	Trumpet	High Density Polyethylene - according to ASTM D3350
15	12-06-01	Compression Seal	NBR - according to FDoT Tab.2.2.1.7-1 Sec.960
16	E-IU-12-07-08	Smooth Plastic Duct 3.50"	High Density Polyethylene - according to ASTM D3350
17	E-IU-12-07-12	Electrofusion Duct Coupler 3.50"	High Density Polyethylene - according to ASTM D3350
18	00-07-04-EM	Vent Port 3/4" NPT PE	Polyethylene - according to ASTM D3350
19	E-IU-12-07-13	High Temp Heat Shrink Sleeve	Coated Polyolefin Backing - according to FDoT Tab.2.2.1.8-1 Sec.960
20	00-08-00	Strand 0.6"	Steel GR270 - according to ASTM A416
21	12-07-07	Duct Coupler 3.00" stepless	Polypropylene - according to ASTM D4101



NOTE: Components marked with "T" on the drawing are temporary

MISCELLANEOUS MATERIALS		
ITEM	DESCRIPTION	
22	Commercially available thread seal tape	
23 Commercially available and compatible silicone grease		

	SPIRAL	
CONCRETE CLASS	4000PSI [27.5MPA]	6500 PSI [45MPA]
LENGTH (L)	13-5/8" [345mm]	
DIAMETER (D)	12-5/8" [322mm]	9-1/2" [242mm]
PITCH (P)	2-3/8" [60mm]	
BAR DIAMETER	#4 - 1/2" [13mm]	
N. OF TURNS	7.5	

INSTALLATION

- Preassemble anchor (AN) and plastic trumpet (PT) (some silicone grease shall be used to facilitate the threading and the compression of the gasket).
- Bolt the assembled AN to the pocket former using the two threaded holes located on the front surface of AN. AN shall be placed perpendicular to the tendon's axis and rotated such as the side injection hole points up.
- 3. The position of the spiral rebar (SR) shall be secured to the AN or to adjacent rebar by tack-welding or proper fixing. The SR shall be rotated such that it won't interfere with 3/4" NPT pipe attachment (if using side injection hole). Align axis of SR with AN. Seal unused port in AN.
- 4. Install the smooth duct as shown on shop drawings and insert it into PT, sealing the connection by heat shrink sleeve (or, if not possible, with heat shrink wrap) in order to prevent concrete from penetrating.
- 5. Carry out the pressure test.

Concreting can now proceed.

- After completion of concrete placement, remove the pocket former and prove that duct is clear of any obstructions or damage and that all injection vents are free and secured.
- Install strands by pushing or pulling individually or as a bundle into duct. Allow sufficient extra length at the active anchorage for stressing.
- Check the wedge plate (WP) for rust and dirt, clean wedge holes with wire brush if necessary. Lightly grease or oil wedge holes.
- Check wedges for rust. Discard rusty wedges and use only clean ones.
- Install wedge plate (keeping up the inspection hole), slip the wedges over the strands and securely place them into wedge holes.
- 11. Do not apply post-tensioning forces until the concrete mean compressive strength f'_{ci} is not less than the values shown on the spiral table. These values refer to cylindrical strength.

Stressing can now proceed.

(!) Appropriate clearance must be kept behind the hydraulic jack while stressing.

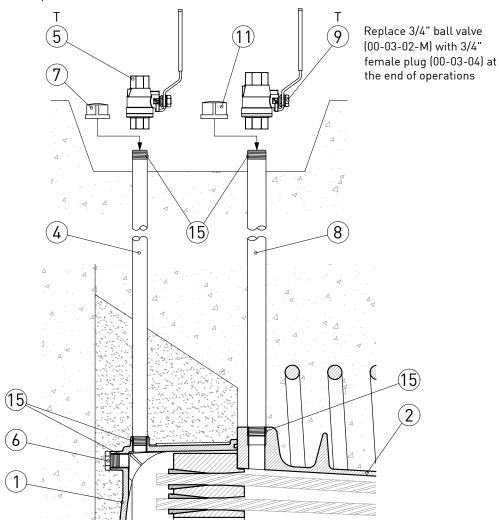
- 12. Stressing operation shall be executed according to the engineer form and requires the simultaneous reading of pressure and elongation. Check the conformity of the final elongations measurement with prescribed values.
- 13. Install the protection cap (PC) with 0-ring sealing on AN using six bolts (some silicone grease shall be used to facilitate the compression of the 0-ring).
- 14. Thread ½" NPT pipe for injection onto the PC and the ¾" NPT pipe onto AN. Use a ½" plug to secure the hole on PC not used (some thread seal tape shall be used to improve the tightness of the threadings).
- 15. Carry out the pressure test.

Injection can now proceed.

- 16. Wax shall be injected through the filler inlet until it escapes from the filler outlet. Special measures shall be applied for long tendons, for tendon paths with distinct high points or inclined tendons to avoid voids.
- 17. All vents and injection inlets/outlets have to be sealed with plugs soon after injection.
- 18. Fill holes with non-shrink grout after post injection operation and inspection are completed.

0	0 02/13/20 First is			sue	L.C.	T.C.	
Rev.	Rev. Date Descrip			tion	Drawn	Checked	
Mate	Material :			Treatment :			
-	-			-			
				Title :			
	TENSA AMERICA LLC - www.tensaamerica.com - PHONE: +1 305-866-9917 1111 KANE CONCOURSE, S.TE 200 - BAY HARBOR ISLAND - 33154 FL Date: 02/13/2020 Dimensions: INCH [mm] mm FOR REFERENCE ONLY			EXTERNAL UNBO PT SYSTEM ASSI for 12AMTS15 (1	EMBLY		
				Drawn : L.CIVATI Check	ked : T.CIC(CONE	
Date				Part # : E-12-00-00 Code : -			
Document Property of TENSA AMERICA LLC This drawing contains proprietary information restricted solely for use on this project and may not be reproduced in whole or in part. For an without the expressed written permission of TENSA AMERICA LLC, the company wills afsequand its rights according to the civil and penal previsi							

Replace 1/2" ball valve (00-01-04-M) with 1/2" female plug (00-01-06) at the end of operations

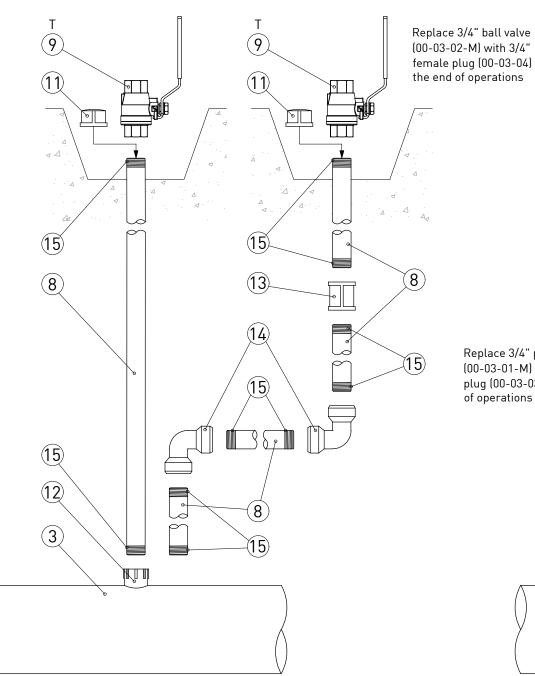


ANCHORAGE CONFIGURATION

top venting and injection

			BILL OF MATERIALS
ITEM	PART #	DESCRIPTION	MATERIAL
1	XX-01-00*	Protection Cap	Nylon S-PA0401 - according to ASTM D5989
2	XX-03-00*	Anchor	Ductil Iron ASTM A536 GR80-55-06 + Galvanization according to ASTM A123
3	E-IU-XX-07-08*	Smooth Plastic Duct	High Density Polyethylene - according to ASTM D3350
4	00-01-03-M	NPT Pipe Nipple 1/2"	SCH40 steel
5	00-01-04-M	NPT Ball Valve 1/2"	SCH40 steel
6	00-01-05	NPT Plug 1/2"	High Density Polyethylene - according to ASTM D3350
7	00-01-06	NPT Female Plug 1/2"	SCH40 steel
8	00-03-01-M	NPT Pipe Nipple 3/4"	SCH40 steel
9	00-03-02-M	NPT Ball Valve 3/4"	SCH40 steel
10	00-03-03	NPT Plug 3/4"	High Density Polyethylene - according to ASTM D3350
11	00-03-04	NPT Female Plug 3/4"	SCH40 steel
12	00-07-04-EM	Vent Port 3/4" NPT PE	Polyethylene - according to ASTM D3350
13	00-07-06	NPT Nipple Coupler 3/4"	SCH40 steel
14	00-07-07	NPT Elbow 3/4"	SCH40 steel

^{*} depending from system dimension



(00-03-02-M) with 3/4" female plug (00-03-04) at the end of operations Replace 3/4" pipe (00-03-01-M) with 3/4" plug (00-03-03) at the end of operations 9 (15) 8 (12) (3)

PIPE INTERNAL CONFIGURATION

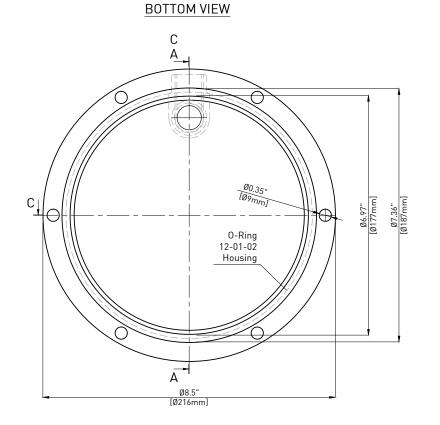
NOTE:

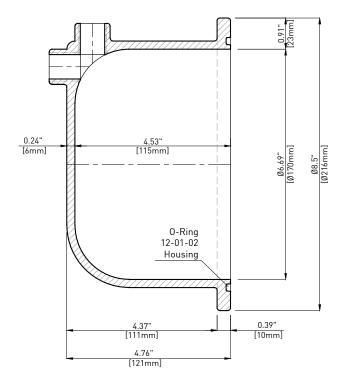
- Vent assemblies can be used as inlet, outlet or drain; when elbows are present, the vent cannot be used for injection / inspection;
- Epoxy grout shall be used to fill recessess: make reference to FDoT standard plans index 462-003 for post-tensioning anchorage and tendon filling details
- Concrete cover must meet FDoT Structures Design Guidelines Section 1.4.2
- Components marked with "T" on the drawing are temporary

MISCELLANEOUS MATERIALS				
ITEM	DESCRIPTION			
15	Commercially available thread seal tape			

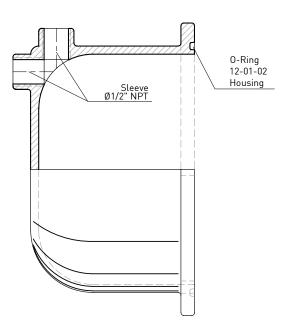
PIPE EXTERNAL CONFIGURATION

_	0//0//10		Finalia		1.0	т.с	
0	04/26/18		First is:	sue	L.C.	T.C.	
Rev.	Rev. Date Descri			otion	Drawn	Checked	
Material : -				Treatment :			
TENSA AMERICA				Title: INTERNAL UNBONDI VENT ASSEN	-	RNAL	
	TENSA AMERICA LLC - www.tensaamerica.com - PHONE: +1 305-866-9917 1111 KANE CONCOURSE, S.TE 200 - BAY HARBOR ISLAND - 33154 FL			Drawn : L.CIVATI Ch	Checked : T.CICCONE		
Date	Date: 04/26/2018 Dimensions: INCH [mm] mm FOR REFERENCE ONLY			Part #: 00-00-01 Code : -			
with	Document Property of TENSA AMERICA LLC This drawing contains proprietary information restricted solely for use on this project and may not be reproduced in whole or in part. For any other use without the expressed written permission of TENSA AMERICA LLC, the company will safeguard its rights according to the civil and penal previsions of the Law.						

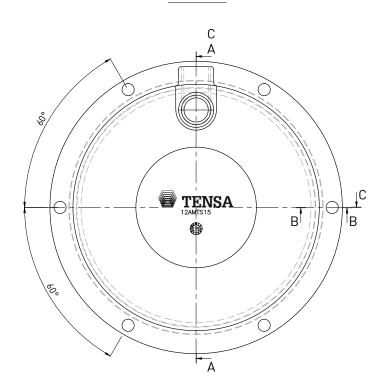




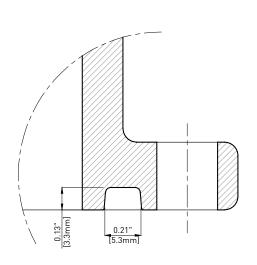
SECTION C-C



TOP VIEW



SECTION B-B



Marking - Type



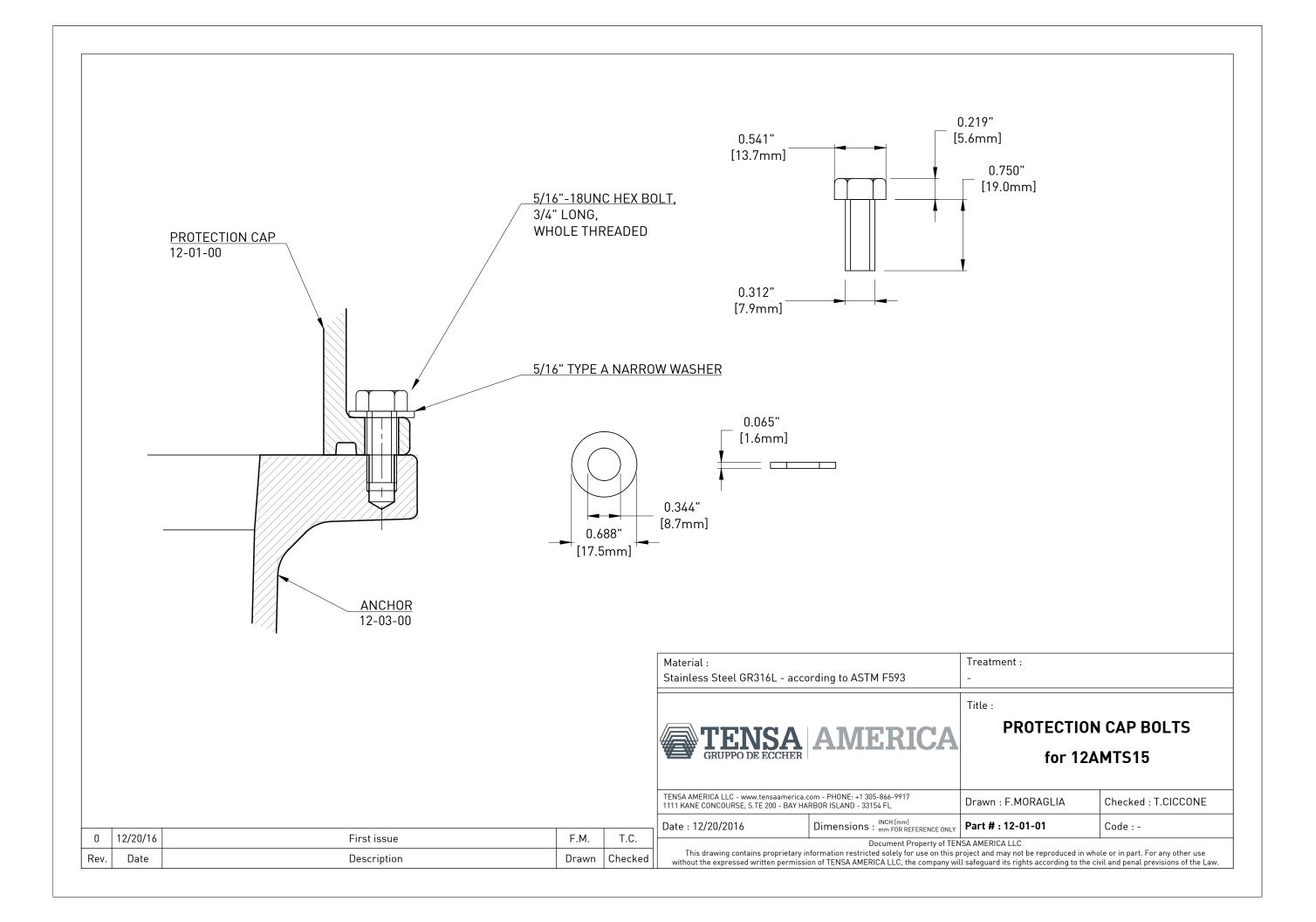
Material :		Treatment :		
Nylon S-PA0401 - according	to ASTM D5989	-		
		Title :		
TENTO A	AMERICA	PROTECTION CAP		
GRUPPO DE ECCHE	AIVIERICA	for	12AMTS15	
TENSA AMERICA LLC - www.tensaameri 1111 KANE CONCOURSE, S.TE 200 - BAY		Drawn : L.CIVATI	Checked : T.CICCONE	
Date : 12/20/2016	Dimensions: INCH [mm]	Part # : 12-01-00	Code · -	

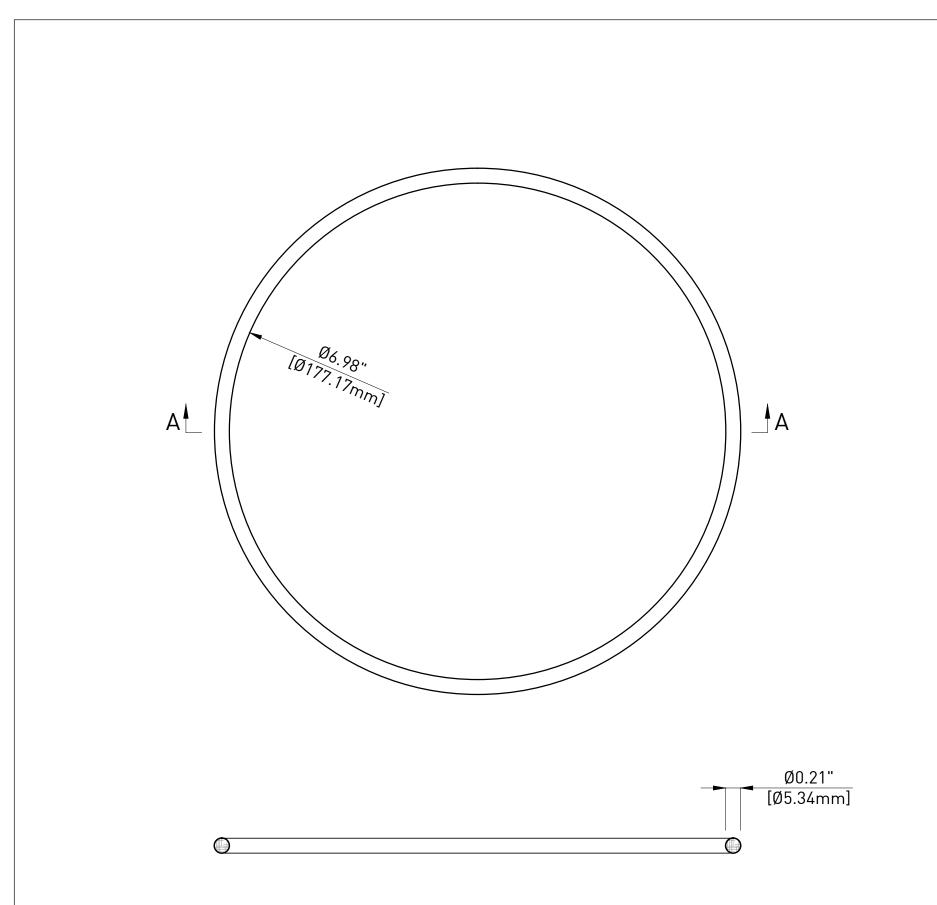
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 0
 12/20/16
 First issue
 L.C.
 T.C.

 Rev.
 Date
 Description
 Drawn
 Checked





0	12/20/16	First issue		L.C.	T.C.
Rev.	Date	Description		Drawn	Checked
Mate		Treatment :			

NBR - according to FDoT Tab. 2.2.1.7-1 Sec.960

Centro Guarnizioni TIGER s.r.l **PROTECTION CAP 0-RING** for 12AMTS15 PT SYSTEM

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 ${\sf Drawn}: {\sf L.CIVATI}$

 ${\sf Checked}: {\sf T.CICCONE}$

Date: 12/20/2016

Dimensions : INCH [mm] mm FOR REFERENCE ONLY

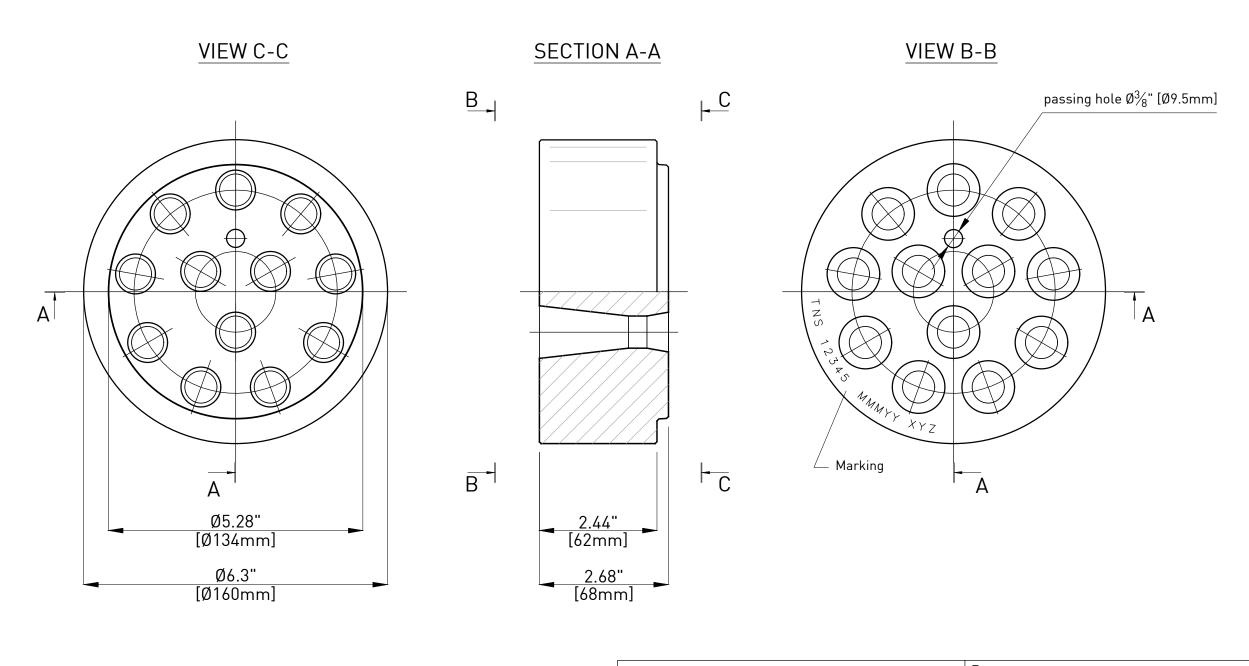
Part #: 12-01-02 Code : OR 06700

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NOTE:

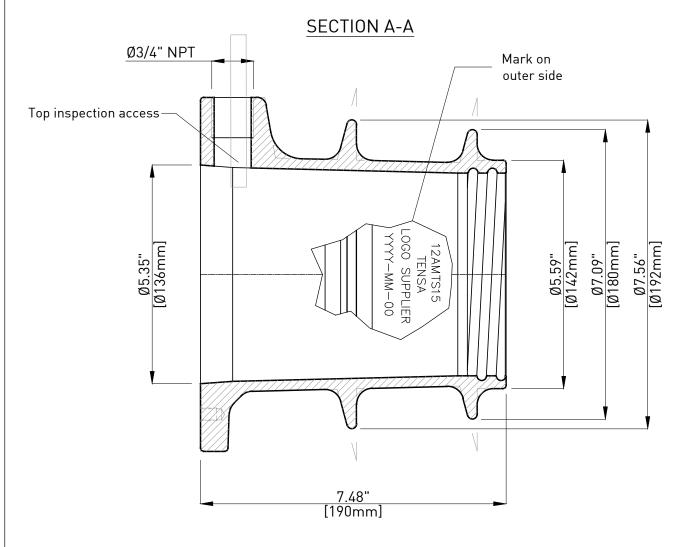
This drawing is not intended for manufacturing purposes.

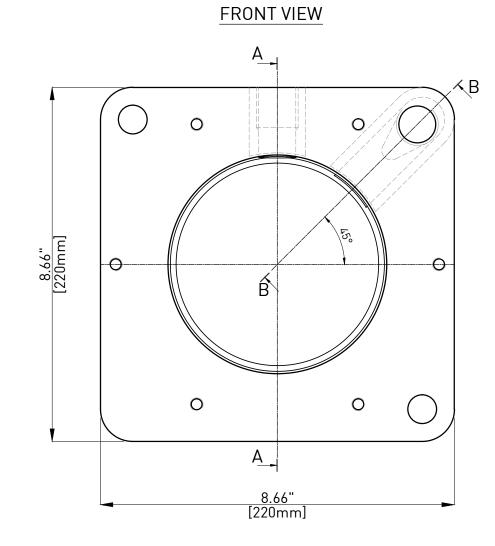


	Material :		Treatment :	
	Steel AISI C1045 Normalized		-	
	TENSA GRUPPO DE ECCHER	AMERICA	for 12AMTS15 (E PLATE 12-06") External bonded systems
	TENSA AMERICA LLC - www.tensaamerica.c 1111 KANE CONCOURSE, S.TE 200 - BAY HA		Drawn : L.CIVATI	Checked : T.CICCONE
7	Date : 05/14/2018	Dimensions : INCH [mm] mm FOR REFERENCE ONLY	Part # : E-IU-12-02-00	Code : -
-	Document Property of TENSA AMERICA LLC This drawing contains proprietary information restricted solely for use on this project and may not be reproduced in whole or in part. For any other use			

 0
 05/14/18
 First issue
 L.C.
 T.C.

 Rev.
 Date
 Description
 Drawn
 Checked





SECTION B-B Front inspection access Ø3/4" NPT

First issue

Description

F.M.

Drawn

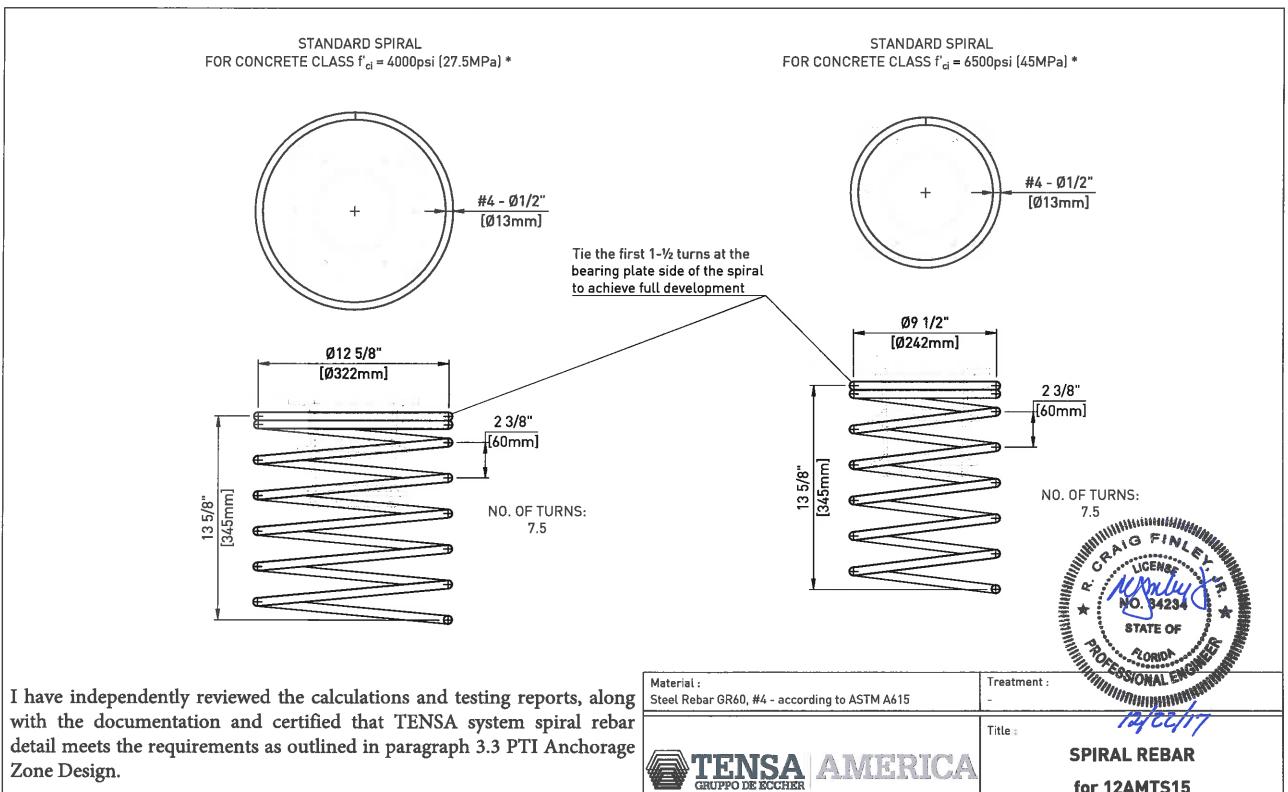
0

Rev.

12/20/16

Date

	Material :		Treatment :		
	Ductil Iron ASTM A536 GR80-55-06 Galvanization according to ASTM A123		to ASTM A123		
	Title:				
	TENSA GRUPPO DE ECCHER	AMERICA	ANCHOR 12A	MTS15 (12-0.6")	
	TENSA AMERICA LLC - www.tensaamerica.c 1111 KANE CONCOURSE, S.TE 200 - BAY HA		Drawn : F.MORAGLIA	Checked : T.CICCONE	
	Date : 12/20/2016	Dimensions : INCH [mm] mm FOR REFERENCE ONLY	Part # : 12-03-00	Code : -	
T.C.		Document Property of TEN			
Checked		This drawing contains proprietary information restricted solely for use on this project and may not be reproduced in whole or in part. For any other use without the expressed written permission of TENSA AMERICA LLC, the company will safeguard its rights according to the civil and penal previsions of the Law.			



(*) Do not apply post-tensioning forces until the concrete mean compressive strength f'ci is not less than the values shown in the present drawing.

NOTE: The local zone reinforcement is to be shown on the shop drawings.

0	12/20/17	First issue	F.M.	T.C.
Rev.	Date	Description	Drawn	Checked

Steel Rebar GR60, #4 - according to ASTM A615

TITLE SPIRAL REBAR
GRUPPO DE ECCHER

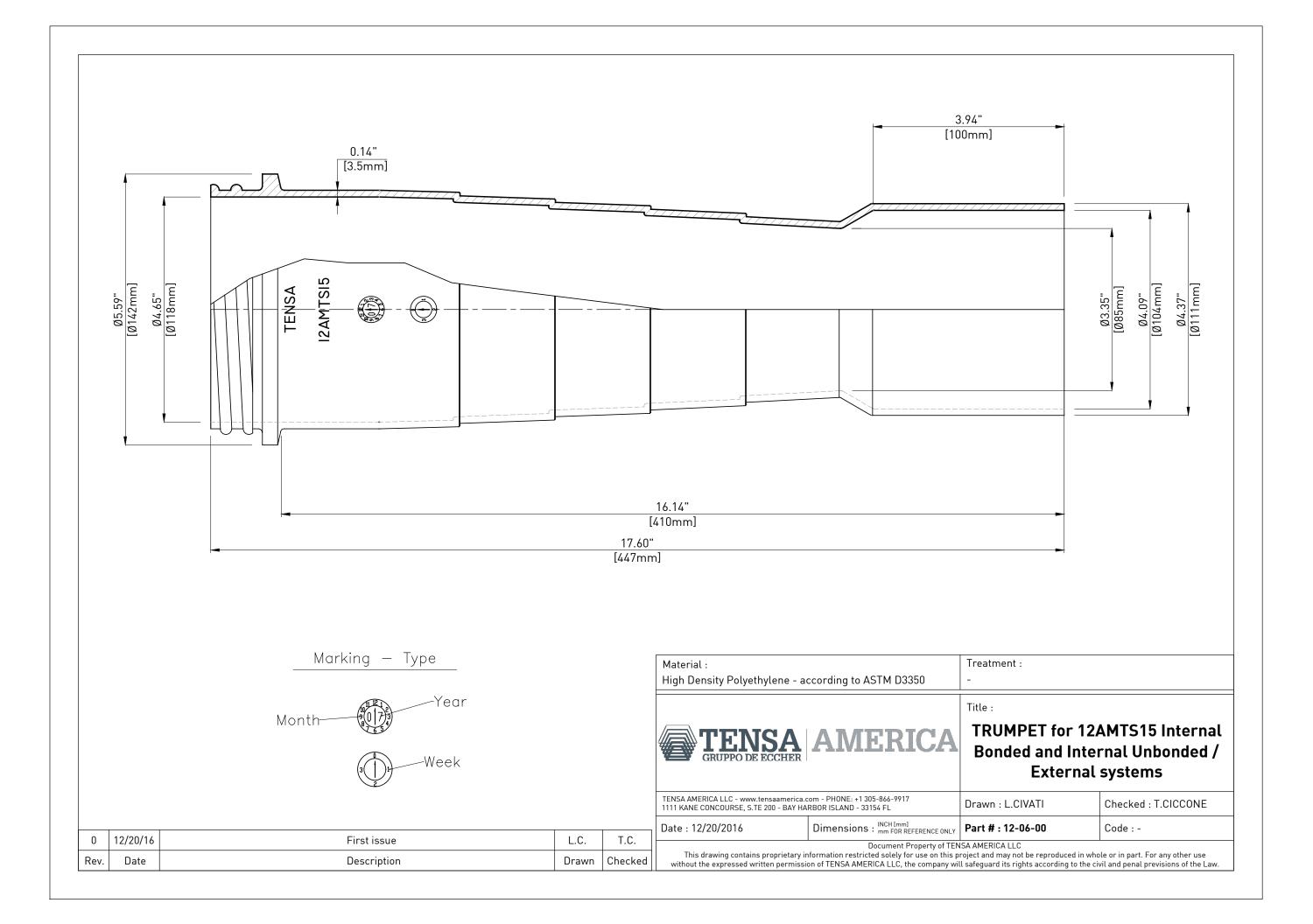
TITLE:

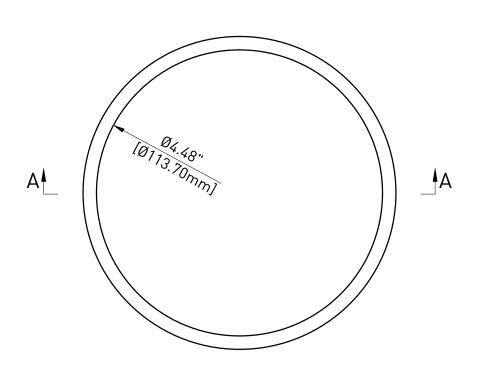
SPIRAL REBAR
for 12AMTS15

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1111 KANE CONCOURSE, S.TE 200 - BAY HARBOR ISLAND - 33154 FL

Date: 12/20/2017

Dimensions: | INCH [mm] | mm FOR REFERENCE ONLY | Part #: 12-05-00 | Code: -







0	08/23/16	First issue	L.C.	T.C.	
Rev.	Date	Description	Drawn	Checked	

Material: NBR - according to FDoT Tab. 2.2.1.7-1 Sec.960 Treatment:

NOTE:

This drawing is not intended for manufacturing purposes.

Title : Centro Guarnizioni TIGER s.r.l **COMPRESSION SEAL** for 12AMTS15 between Anchor and Trumpet

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Part #: 12-06-01

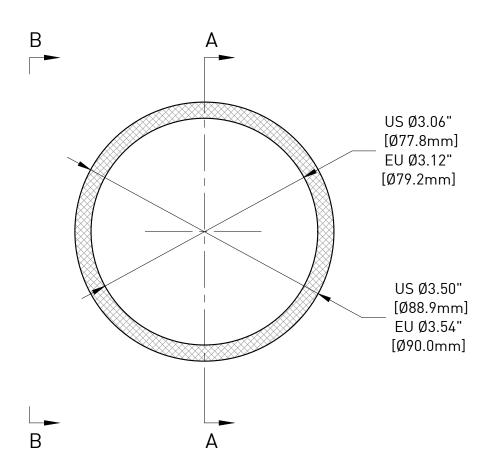
 ${\sf Drawn}: {\sf L.CIVATI}$

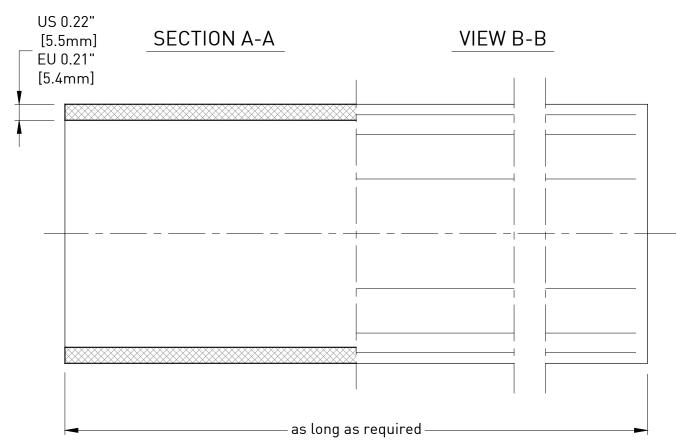
Checked: T.CICCONE

Code : OR 06450

Dimensions: INCH [mm] mm FOR REFERENCE ONLY Date: 08/23/2016

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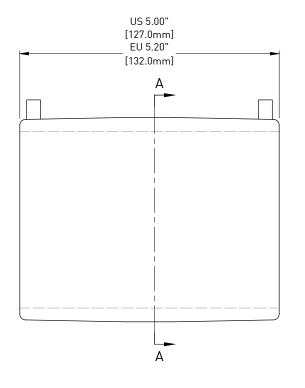
Minimum radius of curvature for prefabricated sections of duct	8 ft (2.44 m)
Minimum radius of curvature for straight sections of duct to be field bent	12 ft (3.66 m)

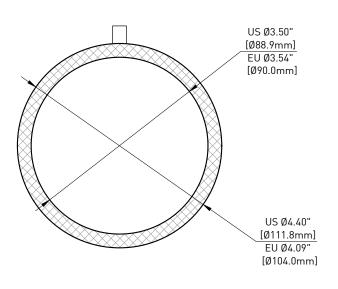
NOTE:

- This drawing is not intended for manufacturing purposes;
- Duct meets FDoT requirements (Par. 2.2.1.2 and 2.4.4 Section 960):
 - ••• maximum dimensional ratio (DR) of 17 as per ASTM D3035 or ASTM F714
 - ••• 125 psi rated
- ••• minimum cell class of 445574C as per ASTM D3350
- ••• minimum OIT of 40 minutes as per ASTM D3895

Α	10/08/19	Updated with measures for US and European versions	L.C.	T.C.
0	05/14/18	First issue	L.C.	T.C.
Rev.	Date	Description	Drawn	Checked







INSTALLATION

Preparing the duct

- 1. Scrape the duct up to 0.4" (10mm) beyond the insertion length of the fitting.
- 2. Clean the welding area and let it dry.
- 3. Insert the duct ends straight into the fitting fot the correct length.
- 4. Install the aligners in order to keep straight position.

The Welding Process

- 5. Connect the welding cables to the electrofusion coupler connectors and enter the welding parameters in the device.
- 6. At the end of the welding cycle, disconnect the cables and wait for the cooling.
- 7. Remove the aligners.

NOTE:

- The United States (US) coupler must be used with the corresponding US duct; the European (EU) coupler must be used with the corresponding EU duct;
- The installation procedure is general; reference to manifacturer's instruction manual for the detailed installation instructions;
- This drawing is not intended for manufacturing purposes;
- Coupler meets FDoT requirements (Par. 2.2.1.5 Section 960):
 - 150 psi rated •••
 - minimum cell class of 445574C as per ASTM D3350 •••
 - minimum OIT of 40 minutes as per ASTM D3895 •••

А	10/08/19	Updated with measures for US and European versions	L.C.	T.C.
0	05/14/18	First issue	L.C.	T.C.
Rev.	Date	Description	Drawn	Checked

Treatment: Material: High Density Polyethylene- according to ASTM D3350



Title :

ELECTROFUSION COUPLER for 3.5" HDPE DUCT CONNECTION Standard fit for 12AMTS15

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Dimensions: INCH [mm] | mm FOR REFERENCE ONLY

Drawn: L.CIVATI

Checked: T.CICCONE

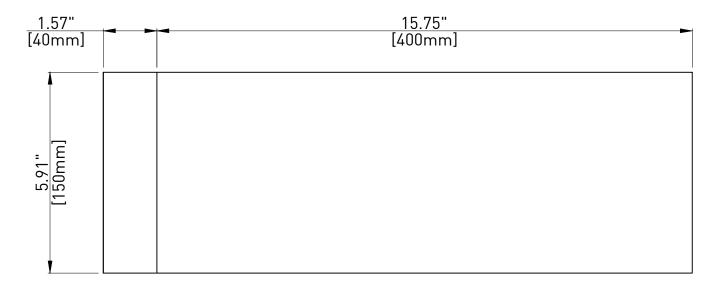
Date: 10/08/2019

Part # : E-IU-12-07-12

Code : -

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UNWRAPPED PLAN VIEW



UNWRAPPED LATERAL VIEW

0.08" [2mm]

NOTE:

- Thickness is type L, i.e. 0.035" [0.9 mm] backing + 0.043" [1.1 mm] adhesive;
- This drawing is not intended for manufacturing purposes;
- Heat shrink sleeve meets or exceeds FDoT requirements (Table 2.2.1.8-1 Section 960);
- For the installation make reference to manifacturer procedure

Α	03/06/20	Width reduction from 300 to 150 mm	L.C.	T.C.
0	05/14/18	First issue	L.C.	T.C.
Rev.	Date	Description	Drawn	Checked

Coated Polyolefin Backing - according to FDoT Tab.2.2.1.8-1 Sec.960

Treatment:

Title :



CANUSA-CPS HIGH TEMPERATURE HEAT SHRINK SLEEVE Standard fit for 12AMTS15 External and **Internal Unbonded Systems**

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Drawn : L.CIVATI

Checked: T.CICCONE

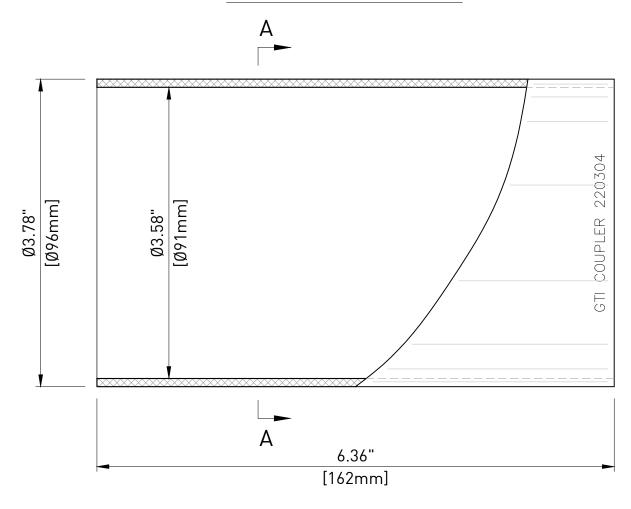
Date: 03/06/2020

Dimensions : INCH [mm] Part # : E-IU-12-07-13

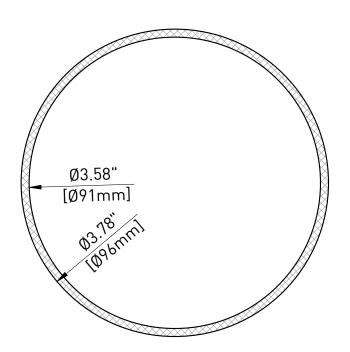
Code: KLNN-90-150-BK

Document Property of TENSA AMERICA LLC

SECTION/ELEVATION



SECTION A-A



NOTE:

- This drawing is not intended for manufacturing purposes;
- Coupler meets or exceeds FDoT requirements (Section 960-2.2.1.5 and 2.4.4);
- Standard fit for 3.00" [76mm] corrugated plastic duct and 3.50" smooth plastic duct.

0	05/24/18	First issue	L.C.	T.C.
Rev.	Date	Description	Drawn	Checked

Polypropylene - according to ASTM D4101

Treatment:



GTI STEPLESS COUPLER Adaptation for 3.00" corrugated duct and 3.50" smooth plastic duct with 12AMTS15 trumpet

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Drawn : L.CIVATI

Title :

Checked : T.CICCONE

Date: 05/24/2018

Dimensions: INCH [mm] Part #: 12-07-07

Code: 220304

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