



TubeTAG[™]



Instruction for use

PRODUCT REFERENCE:

TubeTAG for stainless steel tube	es, pk 10 C-TAG10	
TubeTAG for glass tubes, pk 10	C-TAGG10)



Contents

1.	Introduction				
	1.1	Important safety warnings	4		
	1.2	Important Information	4		
	1.3	Technical support contact details	5		
2.	Fitti	ng and removing TubeTAGs	5		
	2.1	Stainless steel sorbent tubes (1/4" o.d.)	5		
	2.2	Glass sorbent tubes (¼" o.d.)	8		
3.	Conditioning tubes fitted with TubeTAG				
	3.1	Markes' automated thermal desorption system	9		
	3.2	Markes' manual thermal desorption system	10		
	3.3	Markes' tag-ready offline tube conditioner (TC-20 TAG™)	11		
	3.4	Markes' offline tube conditioner (TC-20 [™])	11		
	3.5	Non-Markes thermal desorption system/tube conditioner	12		
4.	Capp	ping tubes fitted with TubeTAG	13		
5.	Sampling on to tubes fitted with TubeTAG				
	5.1	Before sampling	15		
	5.2	Active sampling (pumped sampling)	15		
	5.3	Passive sampling (diffusive sampling)	16		
	5.4	After sampling	16		
6.	Analyzing tubes fitted with TubeTAG				
	6.1	Markes automated thermal desorption system	17		
	6.2	Markes manual thermal desorption system	18		
	6.3	Non-Markes thermal desorption system	19		
7.	Cont	act details	19		

1. Introduction

TubeTAG[™] is a robust radio-frequency identification (RFID) tag that fits securely onto stainless steel or glass tubes. It allows for a more intelligent tube tracking approach (when compared with barcodes and serial numbers) whilst eliminating transcription errors: providing a chain of custody through field monitoring and lab analysis. The use of TubeTAG is recommended by key standard methods such as US EPA Method 325.

TubeTAG is compatible with Markes' entire range of thermal desorption systems and can easily fit to your existing industry standard tube stock.

With the use of a Markes automated thermal desorption system loaded with MIC (Markes Instrument Control) software and/or a TAG^{SCRIBE™}, you can read and rapidly update tube and sample information such as sorbent packing, number of thermal cycles, pressure ratio, sample location and sample start/end times.

The design of TubeTAG is slightly different for stainless steel and glass tubes, but the principals and workflows are the same.



TubeTAGs are generally used in two ways (when using a Markes automated TD system), both offer a new range of benefits to the busy air monitoring lab:

Sample-specific mode

This is where a TubeTAG is attached to a conditioned and capped sorbent tube in the laboratory before being dispatched for sampling. The TubeTAG stays with the tube in the field, allowing for sampling information to be logged to it before returning to the

laboratory. On return to the laboratory the tube is analysed, and the sample information is recorded in the sequence history before the TubeTAG is cleared and removed from the tube. The tag is then ready to go out with another conditioned and capped sorbent tube.

Tube-specific mode

This is where a TubeTAG becomes associated with a specific sorbent tube throughout its lifetime. The TubeTAG holds basic tube information; such as sorbent packing and serial number, and allows for the logging of both tube specific data (obtained through analysis) and its sampling history; such as number of thermal cycles, pressure ratio, tube status, sample location and sample start/end times.

1.1 Important safety warnings

Make sure you follow the precautionary notices presented in this manual. Safety and other special notices appear in boxes and include the following.

WARNING This is the general warning safety symbol and safety alert word to prevent actions that could cause personal injury.

CAUTION Highlights actions that may cause product damage. We use it to highlight information necessary to prevent damage to hardware, software, invalid test results, or to information that is critical for optimal system performance.

NOTES Emphasises important information about a specific task.

1.2 Important Information

- CAUTION Do not directly expose tags to temperatures exceeding 110°C
- **CAUTION** TubeTAGs are not suitable for use with a TC-20[™], please see TC20-TAG[™] for offline conditioning
- NOTES Markes' thermal desorption systems are specifically designed to allow heating to 390°C, with a tagged tube in position, without damaging the tag
- NOTES TubeTAG batch update feature is only available on instruments running MIC 2.0 or later



1.3 Technical support contact details

In the first instance please contact your supplier. If they are unable to resolve your query, please contact Markes International on the details below.

 Website:
 www.markes.com

 E-Mail:
 support@markes.com

 Telephone:
 +44 (0)1443 230935 (UK office)

 +49 (0)69 6681089-10 (German office)
 +1866 483 5684 (US office (toll-free))

 +86 21 5465 1216 (China office)
 +86 21 5465 1216 (China office)

2. Fitting and removing TubeTAGs

2.1 Stainless steel sorbent tubes (1/4" o.d.)

To fit or remove a TubeTAG from a stainless steel or inert coated stainless steel sorbent tube with ¼" outer diameter, a specific tool is required; the TAG fixing/ removal tool (part number: C-TAGTL), this correctly positions the tag and if required, safely removes it without causing scratching.

To fit:

- [1] Grip the tube firmly from the sampling end of the tube
- [2] Slide the tip of the TAG fixing tool into the TAG clip be sure to hold the tool with the metal stop facing the inside of the tag





- [3] Squeeze the handles of the TAG fixing tool tightly whilst sliding into position on the non-sampling end of the tube. The metal stop will prevent the tag from being pushed on too far.
- [4] Once the metal stop is in contact with the tube, stop squeezing the handles your TubeTAG is now correctly placed.





CAUTION Carefully check the alignment of the PTFE (white) component of the TubeTAG after attachment, it must be parallel to the tube to prevent alignment issues that could result in read failures within the automated thermal desorption system.



- [5] You are now ready to write to your tag. To do this plug your TAG^{SCRIBE} into a windows compatible device and load the TAG^{SCRIBE} software or load the TAG^{SCRIBE} window in the MIC software by right clicking on the instruments tile. Position your tube on the TAG^{SCRIBE} or load into your Markes automated thermal desorption system.
- **NOTES** The tube must be positioned TubeTAG face-up in the autosampler tray when analysing to allow for successful reading/writing by the MIC software.

In the software, populate the tube number, packing date and adsorbent packing fields and click <WRITE TAG>.

To remove: Reverse steps 1-4

2.2 Glass sorbent tubes (¹/₄" o.d.)

To fit and remove a TubeTAG from a glass sorbent tube with ¹/4" o.d., a specific tool is required; the TAG fixing/removal key (part number: C-TAGKY), this fixes the tag in position and if required, loosens it for removal. You will also require a ruler.

To fit:

[1] Slide the TubeTAG onto the tube (from the non-sampling end) so that it's positioned exactly 75 mm from the sampling end of the tube



[2] Secure the tag using the TAG fixing key and grub screw on the front face of the TubeTAG



- **CAUTION** Do not overtighten the grub screw as you could cause damage to the tubeOnce the TubeTAG is secured in place, check the distance from the sampling end of the tube again. If it is not exactly at 75 mm, reposition.
 - [3] You are now ready to write to your tag. To do this plug your TAG^{SCRIBE} into a windows compatible device and load the TAG^{SCRIBE} software or load the TAG^{SCRIBE} window in the MIC software by right clicking on the instruments tile.



Position your tube on the TAG^{SCRIBE} or load into your Markes automated thermal desorption system.

- [4] In the software, populate the tube number, packing date and adsorbent packing fields and click write TAG.
- **NOTES** The tube must be positioned TubeTAG face-up in the autosampler tray when analysing, to allow for successful reading/writing by the MIC software.

To remove: Reverse steps 1 and 2

3. Conditioning tubes fitted with TubeTAG

3.1 Markes' automated thermal desorption system

To condition on a Markes automated thermal desorption system *e.g.* TD100-xr or UNITY-ULTRA-xr, put DiffLok[™] caps on the tubes and load them into the autosampler for conditioning.

NOTES The tube must be positioned TubeTAG face-up in the autosampler tray to allow for successful reading/writing by the MIC software.

The tubes will load and condition one-by-one. The tube status, number of thermal cycles and pressure ratio will automatically update. Leak test failure will also update if appropriate.

See TD100-xr manual for further information.





3.2 Markes' manual thermal desorption system

To condition on a Markes manual thermal desorption system e.g. UNITY-xr, load the tube into the tube desorption oven for conditioning, ensure the TubeTAG is positioned face-up.

The tag will not read or be written to by the MIC software. To update tube status and number of thermal cycles you will need to use a TAG^{SCR/BE}.

See the UNITY-xr manual for further information.





3.3 Markes' tag-ready offline tube conditioner (TC-20 TAG™)

To condition on a Markes offline tube conditioner designed for use with TubeTAG, load 20 tubes into the manifold and insert into the conditioning unit.

The TC-20 TAG oven is designed to suit selected single and multi-bed sorbent tubes fitted with TubeTAGs.

CAUTION The TC-20 TAG is not compatible with all packed sorbent tubes. To check compatibility contact Markes.

The tags will not read or be written to by the TC-20 TAG. To update tube status and number of thermal cycles you will need to use a TAG^{SCRIBE} or the batch update feature on a Markes automated thermal desorption system loaded with MIC 2.0 software.



3.4 Markes' offline tube conditioner (TC-20[™])

To condition on a Markes offline tube conditioner you will need to remove the TubeTAGs as they are not suitable for use with TC-20. Carefully store the tags whilst conditioning and re-attach the TubeTAGs after.

Once the tags are removed, load 20 tubes into the manifold and insert into the conditioning unit.



To update tube status and number of thermal cycles you will need to use a TAG^{SCRIBE} or the batch update feature on a Markes automated thermal desorption system loaded with MIC software.



3.5 Non-Markes thermal desorption system/tube conditioner

It is recommended to fit TubeTAGs after conditioning (or analysis) when using a non-Markes thermal desorption system or offline tube conditioner. The TubeTAG can therefore be easily used in sample specific mode, or in tube specific mode with some additional manual steps and careful storage of the tags during analysis/ conditioning.

To update 'tube status' and 'number of thermal cycles' you will need to use a TAG^{SCR/BE}.

See TAG^{SCRIBE} IFU for further information.



File	Tools Help					
		Tube Information				
in t	ARKES ernational ubeTAG	Tube Number Packing Date Adsorbent Packing Sample Tube	379299 01 January 2019 Tenax TA ✓ Unknown ✓	Pressure Ratio Leak Test Failures Tube Re-collected from Benzene Background		
Tube & S	ample Info (EPA 325)	Thermal Cycles Sample Start Information Time will b	Requires Conditioning Ready to Sample Sampled Desorbed Re-collected <u>Conditioned</u> Leak test failure: not desorbe Instrument failure: sample los Instrument failure: sample ret	Sample End Informa Time w	tion # be rounded to the nearest hour	
		Sample Start Time 0	1 January 2000 00:00:00 🗐 🕯	Sample End Time	01 January 2000 00:00:00 🗐 🗸	
	Read TAG		Use current time for Start Time		Use current time for End Time	
		Start Flow Rate	ml/r	nin		
	Write TAG	Sample Location]		Set tube status to: Unknown	
	Clear All Data		Start Sample		End Sample	
	Clear Sample Data		ciait campio		2.10.00.000	

4. Capping tubes fitted with TubeTAG

To cap a tube fitted with TubeTAG a specific tool is required; the TAGLok tool (part number: C-TAGLOK), this tightens the caps securely onto the tube without the need for spanners, minimises the risk of sample loss through incorrect capping or tube damage through overtightening.

You will also need a long-term brass storage cap (part number: C-CF010) and an appropriate tag-ready brass storage cap (part numbers: C-TCF10 for stainless tubes and C-T4GCF10 for glass tubes).

- [1] Finger tighten the long-term brass storage cap on the sampling end of the tube
- [2] Finger tighten the TAG ready long-term storage cap onto the non-sampling end of the tube





- **NOTES** The tag ready long-term storage cap should slot easily between the tag and the tube. Be careful not to misalign the TubeTAG when placing on the cap on the tube: the tag should sit snugly against the cap.
- [3] Quarter turn the long-term brass storage cap on the sampling end of the tube using the TAGLok tool to do this, position the cap/tag in the larger slot of the TAGLok tool
- [4] Quarter turn the tag ready long-term brass storage cap on the non-sampling end of the tube using the TAGLok tool – to do this, position the cap in the larger slot of the TAGLok tool







5. Sampling on to tubes fitted with TubeTAG

5.1 Before sampling

In the sampling location, before sampling on to tubes fitted with TubeTAGs, you can write to the tags using a TAG^{SCRIBE}.

- [1] Plug the TAG^{SCRIBE} into a windows compatible device
- [2] Launch the TAG^{SCRIBE} software
- [3] Populate 'sample start time', 'sample flow rate' and 'sample location'
- [4] Click <SMAPLE START> to write the information to the tag

i be rounded to the nearest	nour
01 January 2000 00:00:	00 🔍 🗸
Use current time for Sta	rt Time
	ml/min
	_
	01 January 2000 00:00:

5.2 Active sampling (pumped sampling)

5.2.1. ACTI-VOC

When using the ACTI-VOC low flow sampling pump, remove the long-term storage caps from your conditioned tubes and attach the ¹/₈" tubing adapter (or the back pressure adapter) to the non-sampling end of the tube. The adapter will sit snugly up against the TubeTAG clip.

For further information see the ACTI-VOC IFU.



5.2.2. Easy-VOC

When using the Easy-VOC grab sampling pump, remove the long-term storage caps from your conditioned tubes and attach a TubeTAG adapter. The adapter sits in the rubber inlet of the pump and the tube should click into position.

For further information see the Easy-VOC IFU.

5.3 Passive sampling (diffusive sampling)

For passive sampling, remove the long-term storage cap from the sampling end of your conditioned tubes and attach a diffusion cap and optional pen clip. The pen clip should click into position in the groove.



5.4 After sampling

Once the sampling period has ended, you can write to the tags using a TAG^{SCRIBE}.

- [1] Plug the TAG^{SCRIBE} into a Windows compatible device
- [2] Launch the TAG^{SCRIBE} software
- [3] Populate sample end time and change the tube status to sampled
- [4] Click 'end sample' to write the information to the tag

Sample End Time	01 January 2000 00:00:00 🗐 🕶
	Use current time for End Time Set tube status to:



6. Analyzing tubes fitted with TubeTAG

6.1 Markes automated thermal desorption system

To analyse on a Markes automated thermal desorption system *e.g.* TD100-xr or UNITY-ULTRA-xr, remove the long-term storage caps from your sampled tubes and re-cap with DiffLok caps before loading into the autosampler.

The TubeTAG must be positioned face-up on the left-hand side of the autosampler trays to allow for successful reading/writing *via* the MIC software.

The tubes will be loaded into the instrument and analysed as specified in the sequence. The tube status, number of thermal cycles and pressure ratio will automatically update. Leak test failure will also update if appropriate. If you recollect a sample the information is transferred to the re-collection tube and the 're-collected from' tube number field is also populated. Sample start-time, end-time and location will be saved in the sequence history.

p-e	Pressure Ratio	Trap Fire Time	Sample Start Time	Sample End Time	Sample Location	Thermal Cycles	Tube Status	
	0.95	2019/03/12 09:41:31	2019-03-12 01:00:00	2019-03-12 04:00:00	123	125	Desorbed	
	0.97	2019/03/12 09.47.57	2019/03/12 02:00:00	2019-03-12 06:00:00	124	122	Desorbed	
	0.90	2019/03/12 09:54:27	2019-03-12 04:00:00	2019-03-12 07:00:00	125	05	Desorbed	
	0.95	2019/03/12 10:00:52	2019/03/12 07:00:00	2019/03/12 10:00:00	126	142	Desorbed	

You have the option to batch update at this point by running the 'TD - Utility: TAG Update' method. Note this is only available when running MIC 2.0 software.

See the TD100-xr manual for further information.





6.2 Markes manual thermal desorption system

To analyse on a Markes manual thermal desorption system *e.g.* UNITY-xr, load the tube into the tube desorption oven for conditioning, ensure the TubeTAG is positioned face-up.

The tag will not read or be written to by the MIC software. To update tube status, number of thermal cycles and clear sample information you will need to use a TAG^{SCR/BE}.



6.3 Non-Markes thermal desorption system

It is recommended to fit TubeTAGs after analysis (or conditioning) when using a non-Markes thermal desorption system. The TubeTAG can therefore be easily used in sample specific mode, or in tube specific mode with some additional manual steps and careful storage of the tags during analysis/conditioning.

To update tube status, number of thermal cycles and clear sample information you will need to use a TAG^{SCR/BE}.

7. Contact details

For technical support, please contact your supplier in the first instance. If they are unable to resolve your query, please contact Markes International's service department:

E: support@markes.com **T:** +44 (0) 1443230935

W: www.markes.com

For instructional videos please visit:

How to fit TubeTAGs to sorbent tubes http://chem.markes.com/TubeTAG/Fitting



How to use TubeTAG to track sorbent tubes during sampling http://chem.markes.com/TubeTAG/Tracking-1

How to use TubeTAG to track sorbent tubes during analysis http://chem.markes.com/TubeTAG/Tracking-2







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TD100-xr[™], UNITY-xr[™], TC-20 TAG[™], TC-20[™], Easy-VOC[™], DiffLok[™], ACTI-VOC[™], TubeTAG[™], TAGLok[™] and TAG^{SCR/BE™} are trademarkes of Markes International.

