Customer Support Note 031

Using VDA 278 preset methods in Maverick and MIC

Disclaimer: It is vital that this Customer Support Note is read carefully before proceeding and that any instructions contained within the document are followed closely. Markes International will not accept responsibility for any damage done to instrumentation or personnel if any instructions within this document are not followed exactly. Any ongoing warranty or contract may be voided if failure to follow these instructions results in damage to the instrumentation. If anything is unclear, you must clarify the details with a Markes representative before proceeding.

VDA 278 was developed by the German Association of the Automotive Industry (VDA), and is a screening method that describes direct thermal desorption of materials with analysis by GC–MS for semi-quantitative determination of the emissions of VOCs and SVOCs from these materials.

Many automotive manufacturers have taken VDA 278 and written an internal standard based on this methodology (for instance, GMW15634 and Toyota D423109). There are minor differences between these methods and VDA 278, but the general principles are the same.

VDA 278 uses a sampling introduction process called direct desorption in which a material is placed directly into an empty thermal desorption (TD) tube. The tube is placed into a thermal desorption instrument, heated and then the emissions from the material are focused on a cold trap, before injection onto a GC–MS system for detection.

VDA 278 describes two procedures, one for the determination of VOC compounds, and one for the determination of the FOG compounds (SVOCs). The analysis of each group of compounds requires dedicated methods for both the TD and GC–MS stages. Furthermore, an external calibration performed under a different set of TD conditions is also employed to allow semi-quantitation of the results obtained from the VOC and FOG analyses.

Which TD method should be employed and what the method parameters should be is often a source of confusion. As a result, dedicated methods have been incorporated into Markes' TD software to simplify this process and ensure consistency between testing laboratories. These methods have also been optimised for the use of glass tubes where appropriate.

This document outlines the procedure that must be followed in order to successfully use the dedicated VDA 278 software mode in Markes' thermal desorption software. The VDA 278 mode is available in Markes' TD Maverick software version 5.2.0 and in Markes Instrument Control (MIC) versions 1.1 and 2.0.

1. Software configuration

After the software has downloaded, the VDA 278 mode can be enabled as follows.

1.1 Maverick 5.2.0

1. In the toolbar select View → Options.
2. In the Configurations tab of the window that appears, select the 'Enable VDA 278 modes' box (Figure 1).

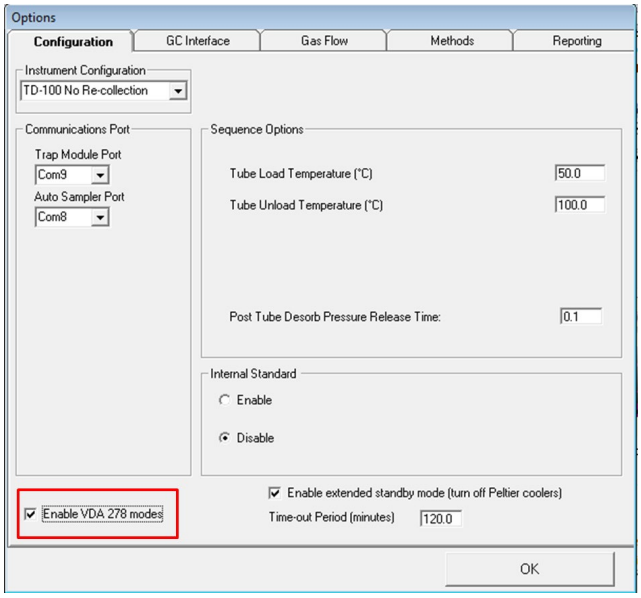

Figure 1: Software configuration – Maverick.

3. The software will need to be restarted to enable the changes, but after this the VDA 278 mode will be available at all times unless de-selected.

1.2 MIC 1.1

1. The VDA 278 methods can be found in the template methods folder with the other standard template methods (Figure 2).

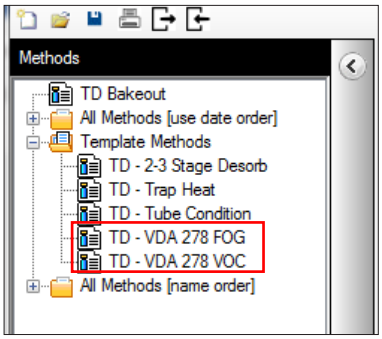

Figure 2: Software configuration – MIC 1.1.

1.3 MIC.2.0

1. The VDA 278 methods can be found in the preset menu in “2–3 Stage Tube Desorption method” template with the other method presets (Figure 3).

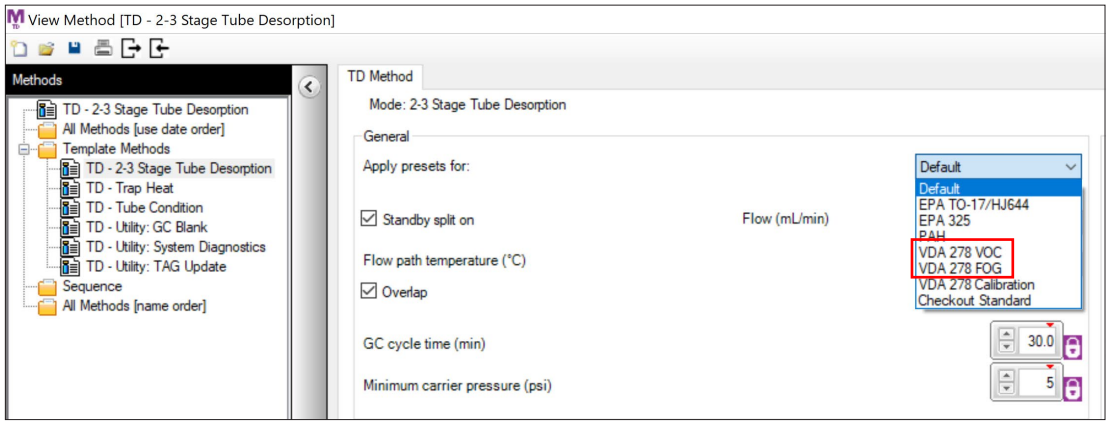

Figure 3: Software configuration – MIC 2.0.

2. The methods can be selected here and saved for later use.

2. Setting up the methods – Maverick 5.2.0

2.1 VDA 278 VOC method

1. Create a new method by selecting File ⟶ New ⟶ Method.
2. Select the dedicated ‘VDA Method 278 VOC for Glass Tubes’ from the drop-down menu.

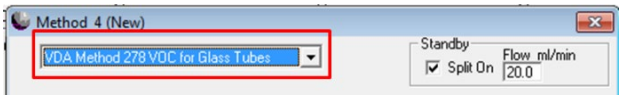

Figure 4: Selecting the method.

3. Set the desorb and split flows as required for the standard method in use (default values are for VDA 278, so no changes should be required for use with this method). All other parameters are locked, as they are consistent between all methods.
4. Save the method with a suitable file name, *e.g.* VDA 278 VOC.mth.

The individual stages for the VDA 278 VOC method should be as shown in Figures 5–7.

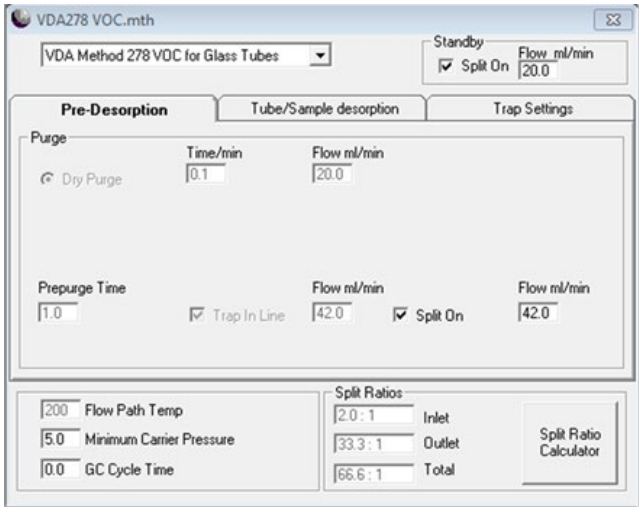

Figure 5: Pre-desorption settings for "VDA Method 278 VOC for Glass Tubes".

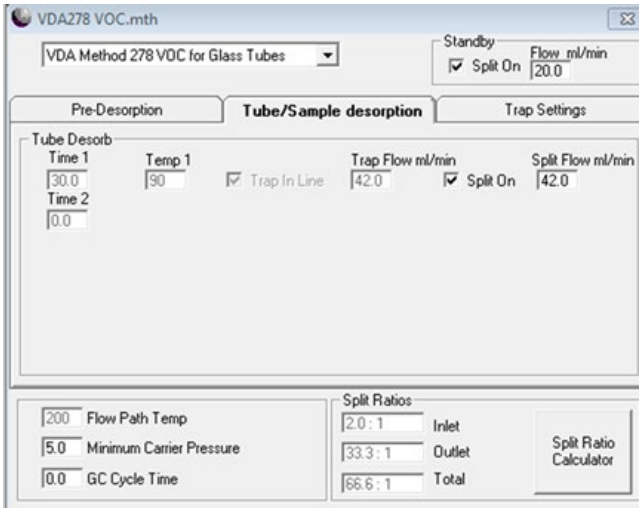

Figure 6: Tube/sample desorption settings for "VDA Method 278 VOC for Glass Tubes".

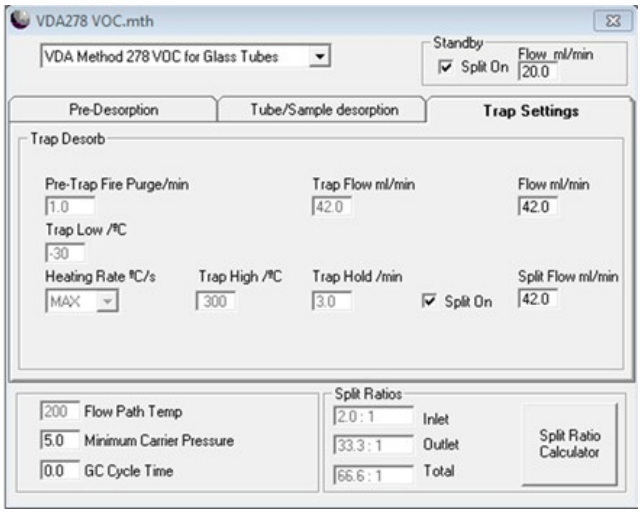

Figure 7: Trap settings for "VDA Method 278 VOC for Glass Tubes".

2.2 VDA 278 FOG method

1. Create a new method by selecting File → New → Method.
2. Select the dedicated 'VDA Method 278 FOG for Glass Tubes' from the drop-down menu.

Figure 8: Selecting the method.

3. Set the desorb and split flows as required for the standard method in use (default values are for VDA 278, so no changes should be required for use with this method). All other parameters are locked, as they are consistent between all methods.
4. Save the method with a suitable file name, *e.g.* VDA 278 FOG.mth.

The individual stages for the VDA 278 FOG method should be as shown in Figures 9–11.

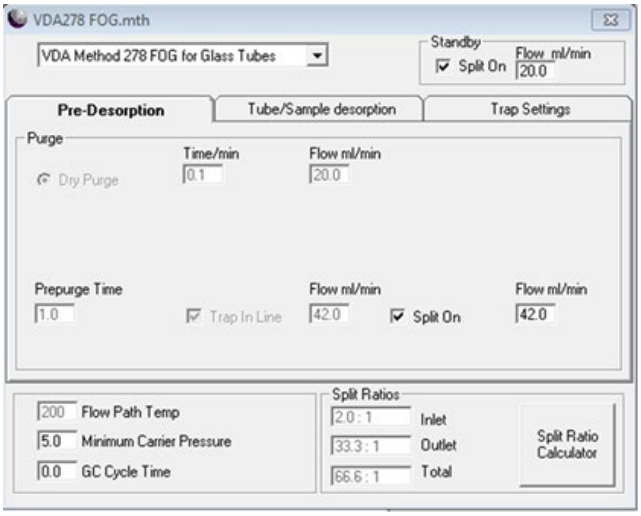

Figure 9: Pre-desorption settings for "VDA Method 278 FOG for Glass Tubes".

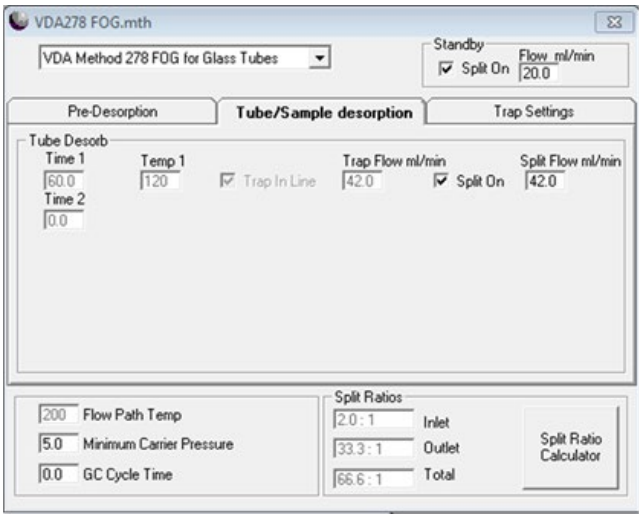

Figure 10: Tube/sample desorption settings for "VDA Method 278 FOG for Glass Tubes".

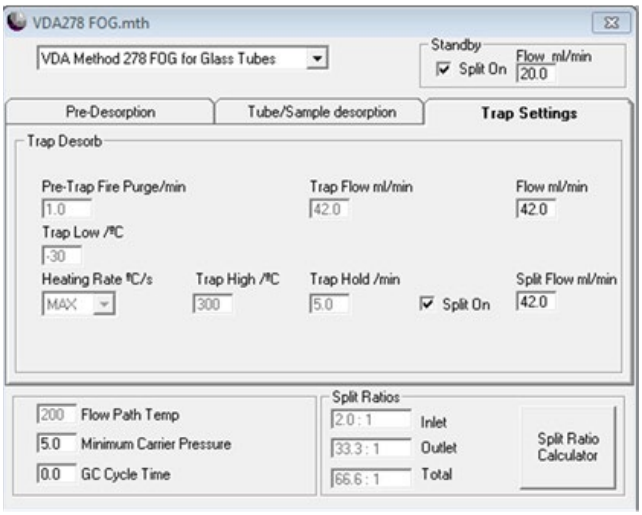

Figure 11: Trap settings for "VDA Method 278 FOG for Glass Tubes".

2.3 VDA 278 calibration method

The VDA 278 calibration samples are injected onto stainless steel tubes, so a different way of accessing the method is required. An existing default method for this is included as a standard two-stage (or three-stage) desorption method.

1. Open the default method by selecting File → Open, and selecting the following method: C:\ProgramData\Markes TD\Methods\VDA 278 Calibration.mth.
2. Set the desorb and split flows as required for the standard method in use (default values are for VDA 278, so no changes should be required for use with this method). All other parameters are locked, as they are consistent between all methods. Ensure the flows are the same as for the VOC and FOG sample methods.
3. Save the method.

The individual stages for the VDA 278 calibration method should be as shown in Figures 12–14.

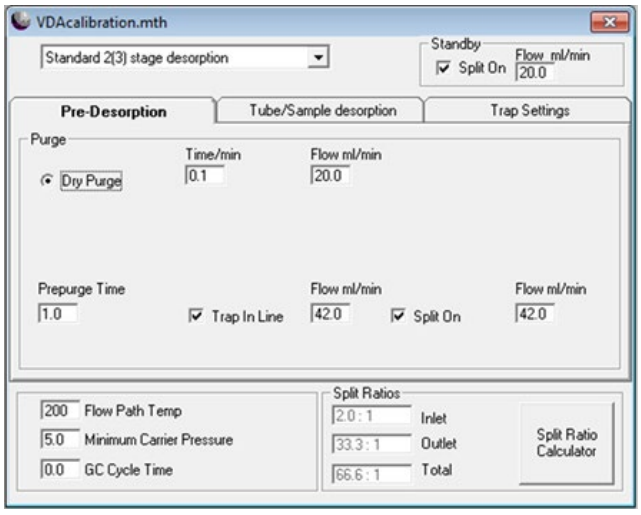

Figure 12: Pre-desorption settings for "VDA Method 278 Calibration method".

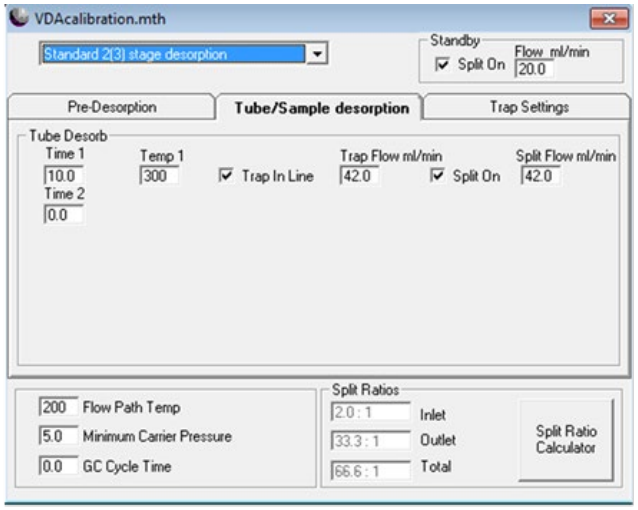

Figure 13: Tube/sample desorption settings for "VDA Method 278 Calibration method".

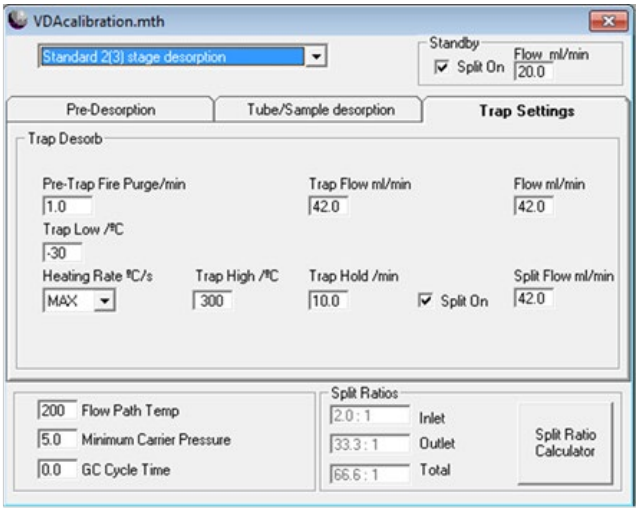

Figure 14: Trap settings for "VDA Method 278 Calibration method".

3. Setting up the methods – Markes Instrument Control (MIC) 1.1

Open the Method Editor, and select 'Template Methods'. In this folder there are templates for the standard 2/3-stage desorption, tube conditioning and trap conditioning, as well as two VDA 278 methods (see Figure 2).

Figures 15–17 show the parameters set for the three VDA 278 methods in MIC. The split ratios are all that can be modified, and this should only be altered if specified in the standard method.

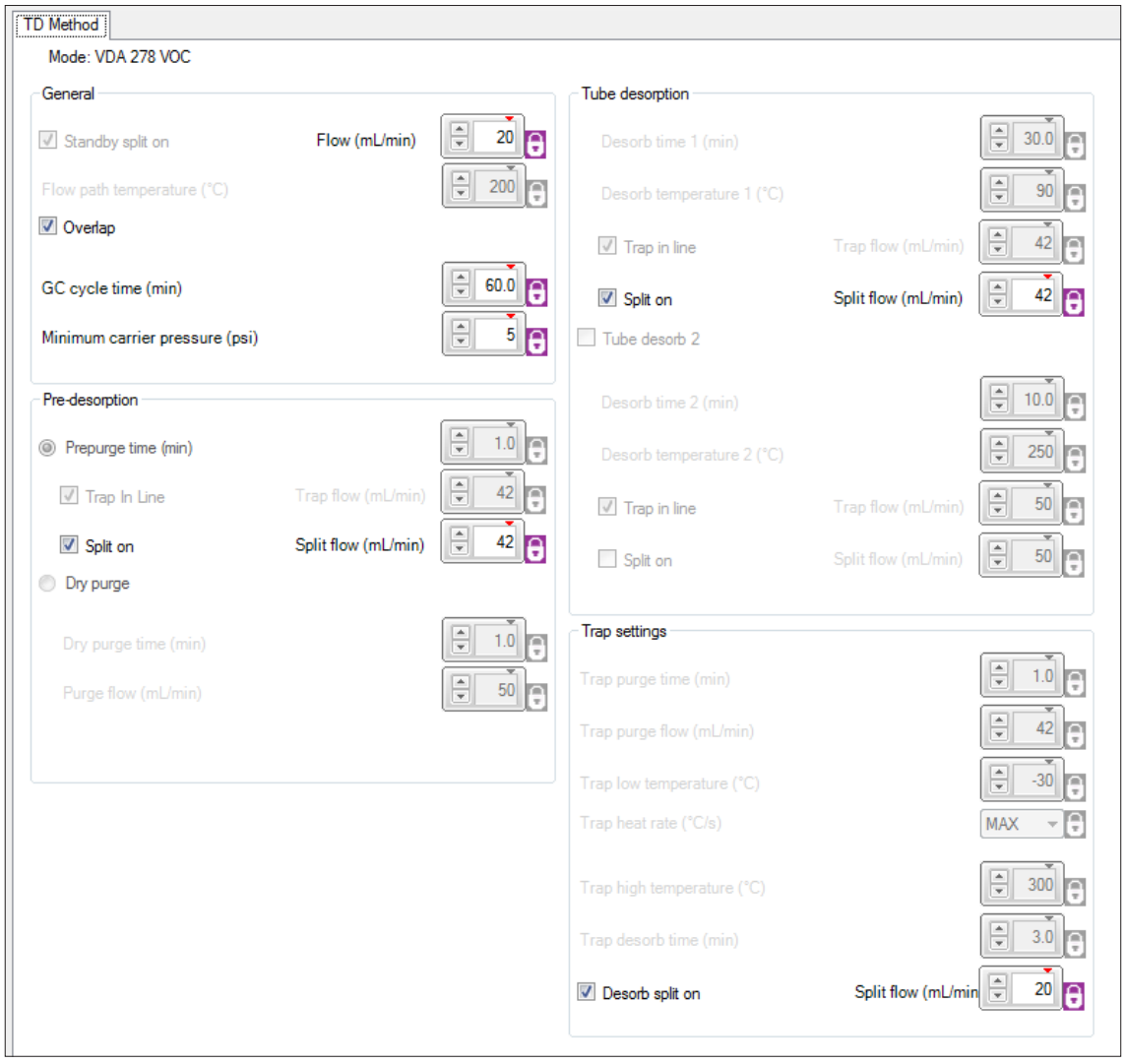

Figure 15: Settings for the VDA Method 278 VOC method.

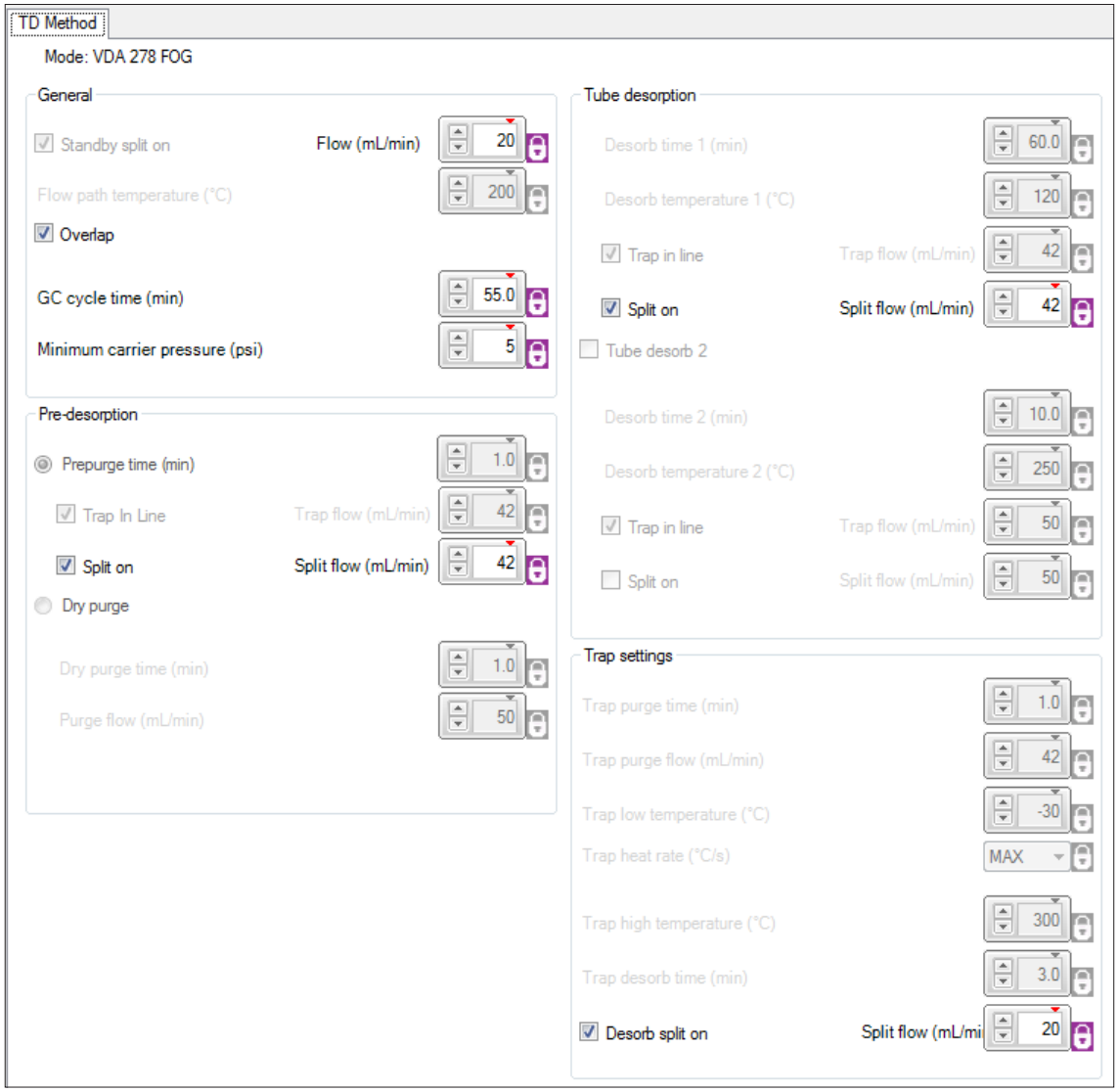

Figure 16: Settings for the VDA Method 278 FOG method.

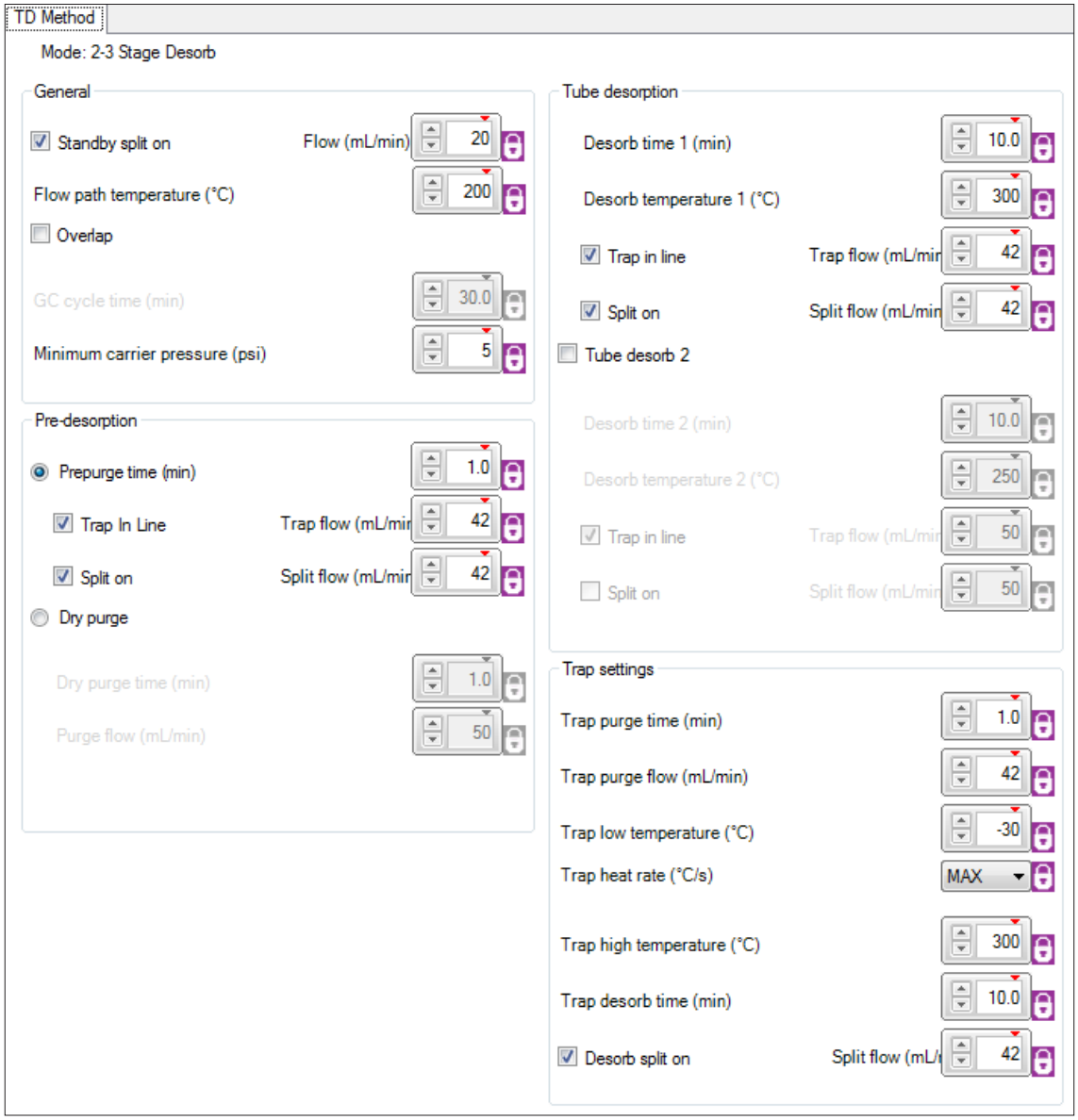

Figure 17: Settings for the VDA Method 278 Calibration method.

4. Setting up the methods – Markes Instrument Control (MIC) 2.0

Open the Method Editor, and select 'Template Methods'. In this folder there are templates for the standard 2/3-stage desorption, tube conditioning and trap conditioning. In the 2/3-stage desorption template method you can then select either of the two VDA 278 methods in the drop-down menu (see Figure 3).

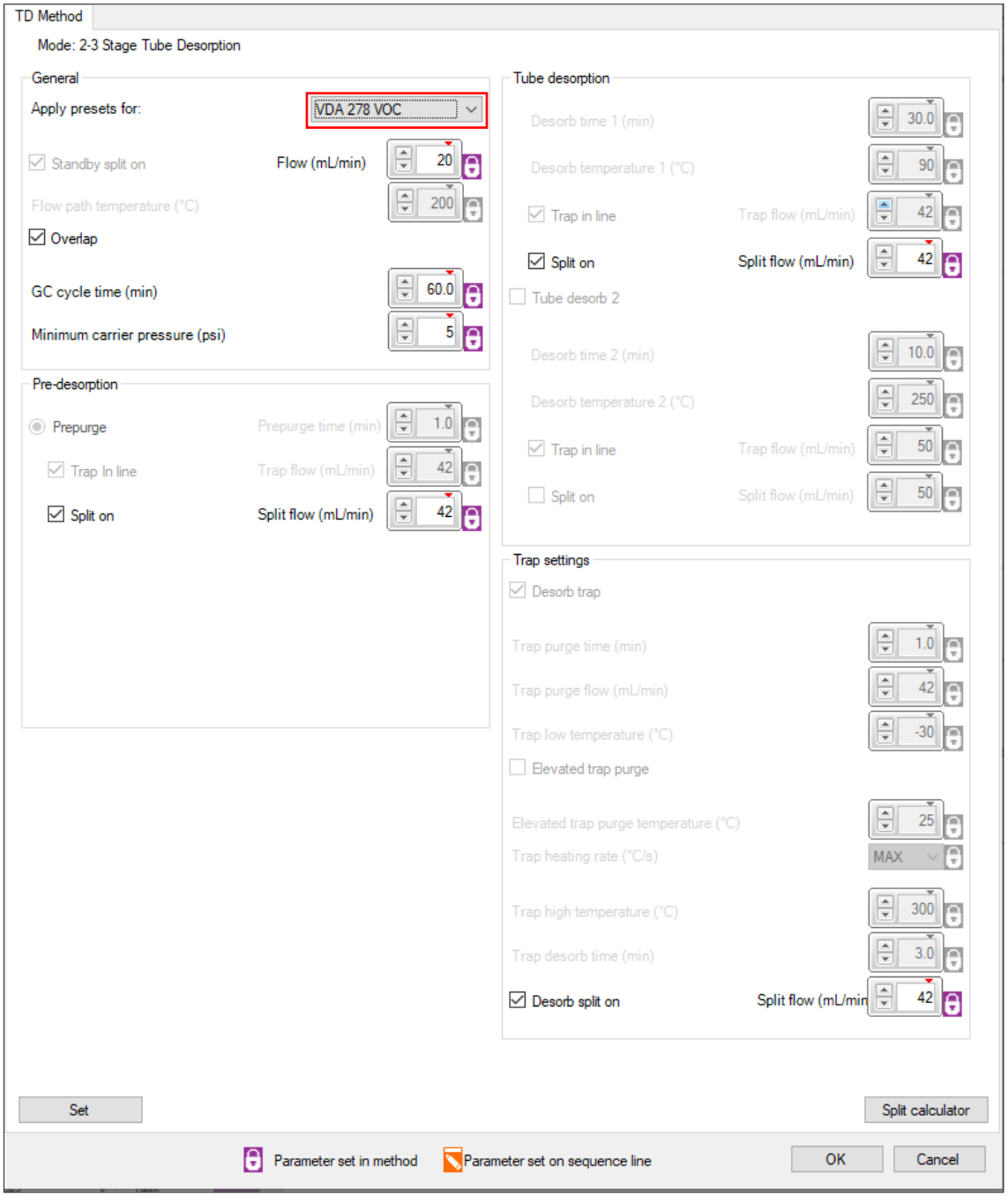

Figure 18: Settings for the VDA Method 278 VOC method.

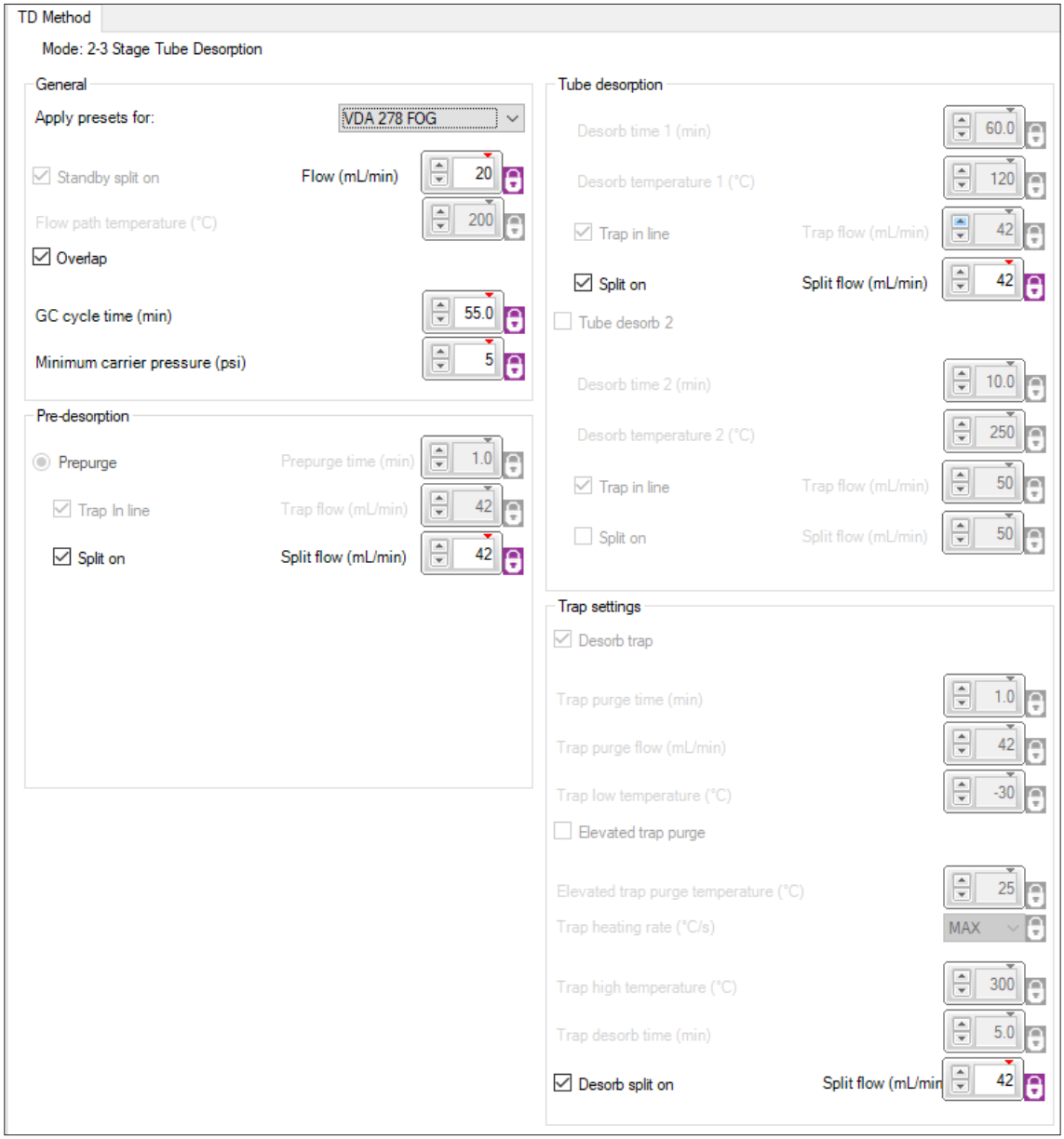

Figure 19: Settings for the VDA Method 278 FOG method.

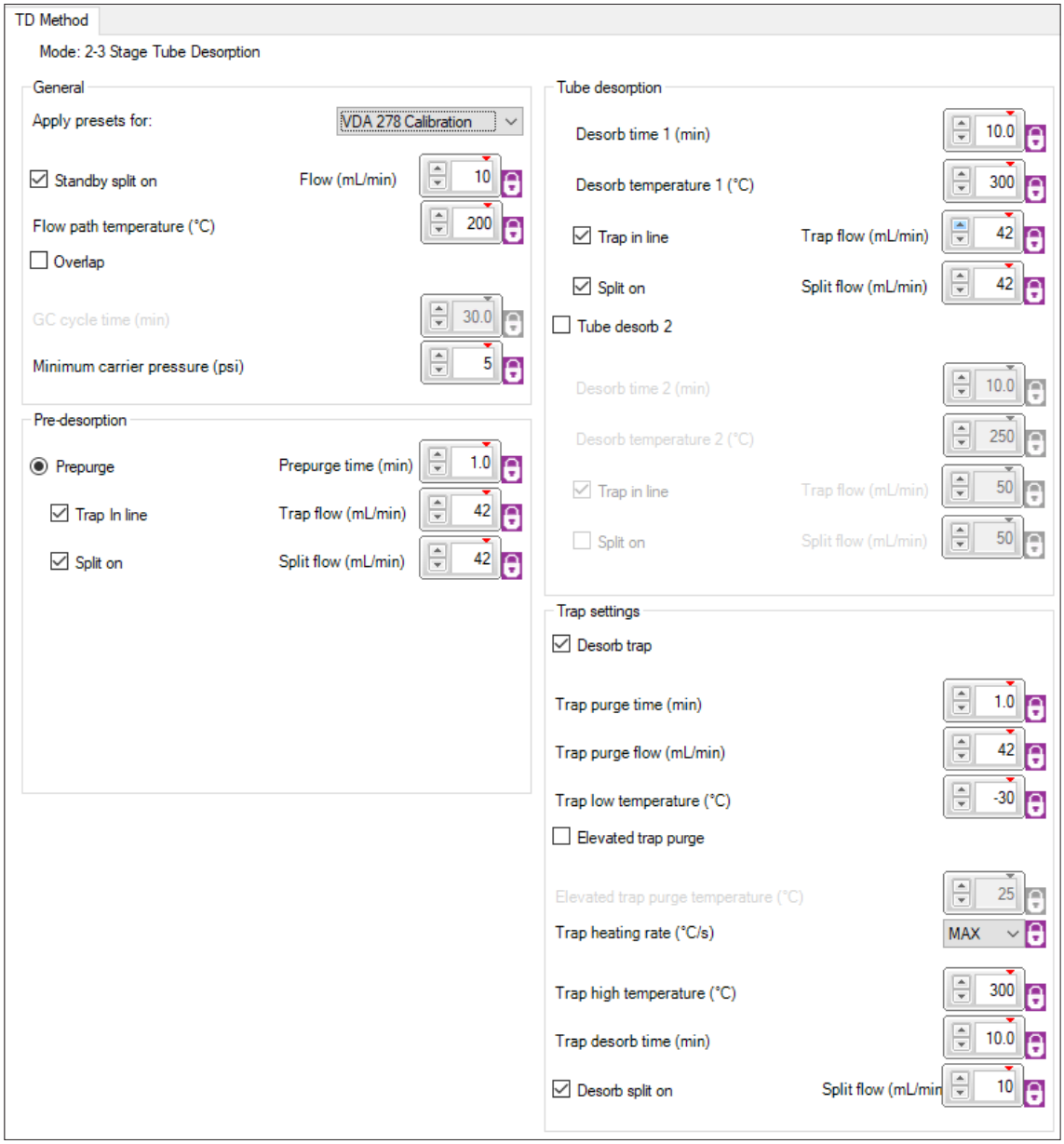

Figure 20: Settings for the VDA Method 278 Calibration method.

Please refer to Application note 142 for a full guide on how to analyse samples by VDA 278.

For all technical support queries, please contact Markes International.

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