

# BPX1-SimD

## Capillary Columns

A new technology high temperature methyl silicone range of capillary columns are now available for ASTM D2887 and its extended petroleum crude methods (HTSD). The columns feature a new dimensionally stabilized phase chemistry providing increased temperature range and reduced bleed.

### NEW TECHNOLOGY

BPX1 was designed as a high temperature alternative to conventional 100% dimethylsilicone stationary phases. With a routine operating temperature of 430°C, extremely low bleed and excellent chemical inertness, the column is superior to all "MS" grade columns on the market.

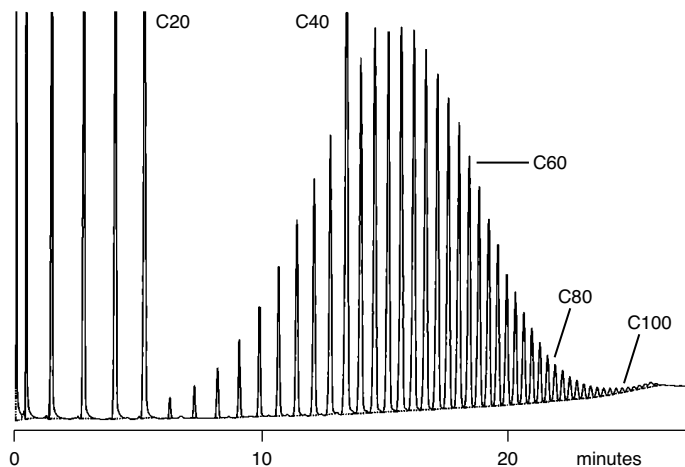
The BPX1 column offers two major advantages over competitors' conventional dimethyl silicon columns. First, the low bleed at the upper temperatures required for the extended high temperature analysis results in better integration and therefore better quantitation for the higher hydrocarbon numbers. This results in the ability to quantify C110 without background subtraction or column compensation from a blank analysis. Second, lower column bleed means less loss of column phase and therefore a smaller decrease in capacity ratios. This is important to the practising chromatographer as the calibration can be carried out less often because of greater stability in retention times.

#### Figure 1

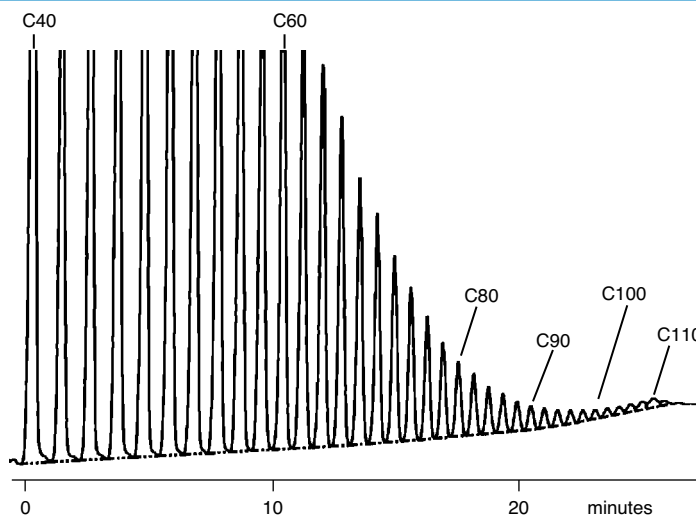
The analysis of a standard mixture used for HTSD is shown in **Figure 1**. This mixture uses hydrocarbons ranging from C10 to C20, Polywax 655 and C40. C40 is spiked into the mix as a reference point in the mixture. All major peaks are even numbered carbons. This chromatogram shows excellent separation, minimal bleed and the ability to quantify C110 without using background subtraction or column compensation from a blank analysis - all in less than 25 minutes at a final temperature of 420°C.

**Figure 1. Standard mix for HTSD using BPX1-SimD**

<b>Phase:</b>	<b>BPX1, 0.1µm</b>	<b>Separation Systems Injector</b>
<b>Column:</b>	<b>5m x 0.53mm ID</b>	Initial Temp.: 40°C
Initial Temp.:	40°C	Rate: 15°C
Rate:	15°C	Final Temp.: 420°C, 5 min.
Final Temp.:	420°C, 5 min.	
Detector Temp.:	440°C	
Carrier Gas:	Helium, 10mL/min	
Instrument:	HP 6890	
<b>Part No:</b>	<b>054800</b>	



**Figure 2. Enlarged section of Figure 1.**

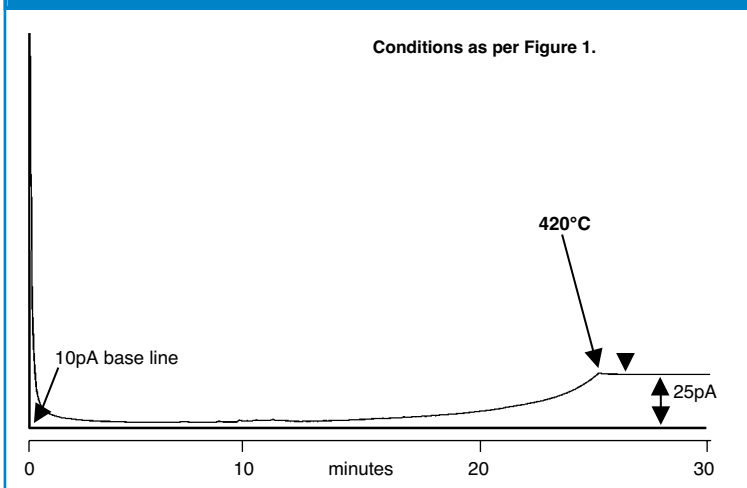


#### Figure 2

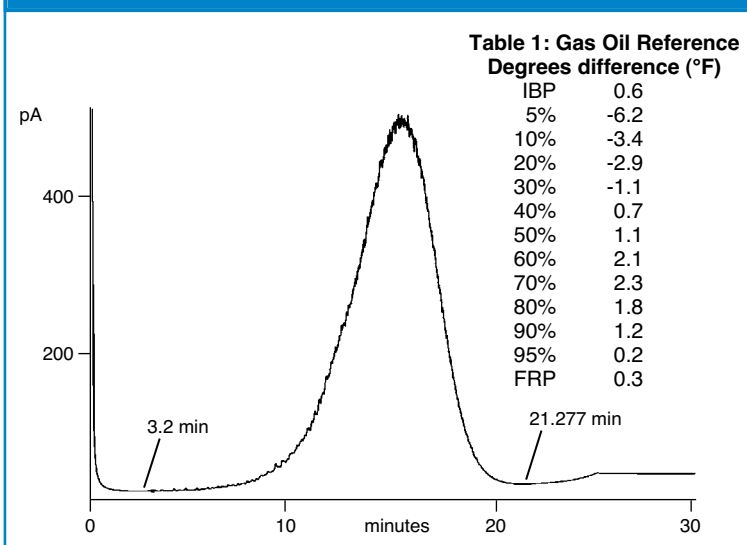
A portion of the previous chromatogram from C40 to the end of the

analysis (expanded vertically) shows excellent resolution and the ability to see beyond C110.

**Figure 3. CS2 Blank**



**Figure 4. Reference Gas Oil MT-60**



**Figure 3**

A blank analysis of neat carbon disulfide. This displays the bleed from the column at 420°C of 25 picoamps. This low bleed allows for easier integration of the peaks above C100.

**Figure 4**

The analysis of a reference gas oil is used to verify the calibration of the system in regard to boiling points. It guarantees the effectiveness of the column to produce simulated distillation data that fits within specified guidelines of reproducibility.

The calculated data from this analysis are shown in **Table 2**. This data shows excellent correlation between the expected temperature at which a certain percentage of the reference gas oil is expected to elute and the calculated temperature from the calibration.

## UNIQUE ADVANTAGES

- Not a silphenylene but a dimensionally stabilized methyl siloxane
- High temperature capabilities even with thicker films compared with standard methyl silicone columns
- Lower bleed
- Maximum column temperature 430°C

## APPLICATIONS

BPX1-SimD range of columns are specifically designed for the American Society of Testing and Materials (ASTM) method D2887, their extended methods and the new High Temperature Simulated Distillation (HTSD) method. The new method extends the boiling range distribution requiring a higher temperature - lower bleed capillary column. BPX1-SimD offers specifications required for these methods.

**Table 2. QC Boiling Point Table ASTM D2887 High-Temp**

% Off	BP(°F)	QC(°F)	Diff
IBP	698.6	698.0	0.6
5.00	872.8	879.0	-6.2
10.00	918.6	922.0	-3.4
15.00	943.8		
20.00	963.1	966.0	-2.9
25.00	979.6		
30.00	993.9	995.0	-1.1
35.00	1005.8		
40.00	1016.7	1016.0	0.7
45.00	1027.3		
50.00	1037.1	1036.0	1.1
55.00	1046.3		
60.00	1055.1	1053.0	2.1
65.00	1063.5		
70.00	1072.3	1070.0	2.3
75.00	1081.3		
80.00	1091.8	1090.0	1.8
85.00	1103.3		
90.00	1117.2	1116.0	1.2
95.00	1138.2	1138.0	0.2
FBP	1194.3	1194.0	0.3

# BPX1-SimD

## Capillary Columns

### SPECIFICATIONS

<b>Polarity:</b>	Non Polar	
<b>Operating Feature:</b>	Extremely Low Bleed	
<b>Analysis Range:</b>		
Description	Fused Silica Tubing	Analysis Range
5 metre, 0.1 $\mu$ m film:	Aluminum Clad	C5 to C110+
10 metre, 0.9 $\mu$ m film:	Polyimide Coated	C5 to C70+
10 metre, 2.65 $\mu$ m film:	Polyimide Coated	C5 to C15+
<b>Maximum operating Temperature:</b>		
0.1 $\mu$ m film	430°C+	
0.9 $\mu$ m film	400°C	
2.65 $\mu$ m film	370°C	

All of the data presented was produced by Dr. Lubkowitz and the staff at Separation Systems Inc. on a system using the Separation Systems programmed temperature vaporization injector (PTV) and the SIMDIS EXPERT® software.

### BPX1-SimD CAPILLARY COLUMNS ORDERING INFORMATION

ID mm	Film $\mu$ m	6 metre	10 metre
0.1	0.1	-	054777
0.53	0.1	-	054803
0.53	0.9	-	054801
0.53	2.65	0548025	054802



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