

# Supelco SLB®-IL60 Ionic Liquid GC Columns

## Lower FID Bleed

Higher temperature GC columns are desirable, as they may allow decreased analysis times, elevated bake-out to remove large non-target compounds, and analysis of higher boiling compounds. However, higher oven temperatures also tend to accelerate the amount of column bleed. When working with a flame ionization detector (FID), excessive bleed is undesirable as it lowers the signal-to-noise, resulting in a loss of sensitivity. Column manufacturers routinely list the maximum temperature a column can safely be used at before the level of column bleed renders the column unuseable.

To illustrate the lower FID bleed characteristic of the SLB-IL60 column, it was compared directly to five popular commercially available PEG columns, each from a different manufacturer. All columns were 30 m x 0.25 mm I.D., 0.25 µm dimensions, except the SLB-IL60 column, which has a 0.20 µm film thickness. **Table 1** shows the maximum temperature limits for all columns tested. Complete specifications of SLB-IL60 columns are shown in **Table 2**.

**Table 1. Maximum Temperature Limits\***

Column	Isothermal	Programmed
PEG 1	280 °C	280 °C
PEG 2	260 °C	270 °C
PEG 3	250 °C	260 °C
PEG 4	250 °C	260 °C
PEG 5	280 °C	300 °C
SLB-IL60	300 °C	300 °C

\* Obtained from paperwork included with commercial columns.

**Table 2. SLB-IL60 Column Specifications**

- Application: The SLB-IL60 polar ionic liquid column has a polarity/selectivity similar to that of polyethylene glycol (PEG) columns (usually have 'wax' in the product name), but different enough to provide a unique elution pattern. It also has a higher maximum temperature of 300 °C, compared to 250-280 °C for most PEG columns. These features make it an excellent alternative to existing 'wax' columns. The combination of a high thermal limit and an orthogonal selectivity to non-polar columns also makes it a good GCxGC column choice. Launched in 2012.
- USP Code: None
- Phase: Non-bonded; proprietary
- Temp. Limits: 35 °C to 300 °C (isothermal or programmed)

## FID Bleed Comparison

Following column installation, conditioning, and the analysis of two test mixes to demonstrate the column and system were working properly, a temperature programmed bleed run was performed. The final temperature used for each column was based on its programmed temperature limit. All six chromatograms are displayed in **Figure 1** (see back page). As shown, only the PEG 4 column exhibited a lower FID bleed level than the SLB-IL60, but did so at a final oven temperature that was 40 °C lower. The PEG 5 column exhibited the highest FID bleed, which is surprising considering it has a 300 °C limit for programmed use.

## Conclusion

Columns based on polyethylene glycol phase chemistry are widely used for a variety of applications (such as solvents and FAMES). Traditional PEG phase chemistry requires PEG columns to be used at maximum temperatures of 260-280 °C, well below the 300 °C limit of the SLB-IL60 column. Most of the PEG columns tested generated FID bleed which exceeded that of the SLB-IL60 column, even though the SLB-IL60 column was used at a higher oven temperature. The PEG 5 column incorporates a non-traditional PEG phase, and also has a 300 °C rating, but exhibited a much higher FID bleed level. This data shows that the SLB-IL60 column exhibits lower column bleed characteristics for FID use, compared to existing PEG columns.

## Featured Products

Description	Cat. No.
SLB-IL60, 15 m x 0.10 mm I.D., 0.08 µm	29503-U**
SLB-IL60, 30 m x 0.25 mm I.D., 0.20 µm	29505-U
SLB-IL60, 60 m x 0.25 mm I.D., 0.20 µm	29506-U**
SLB-IL60, 30 m x 0.32 mm I.D., 0.26 µm	29508-U**
SLB-IL60, 60 m x 0.32 mm I.D., 0.26 µm	29509-U**

\*\*Products will be available soon.

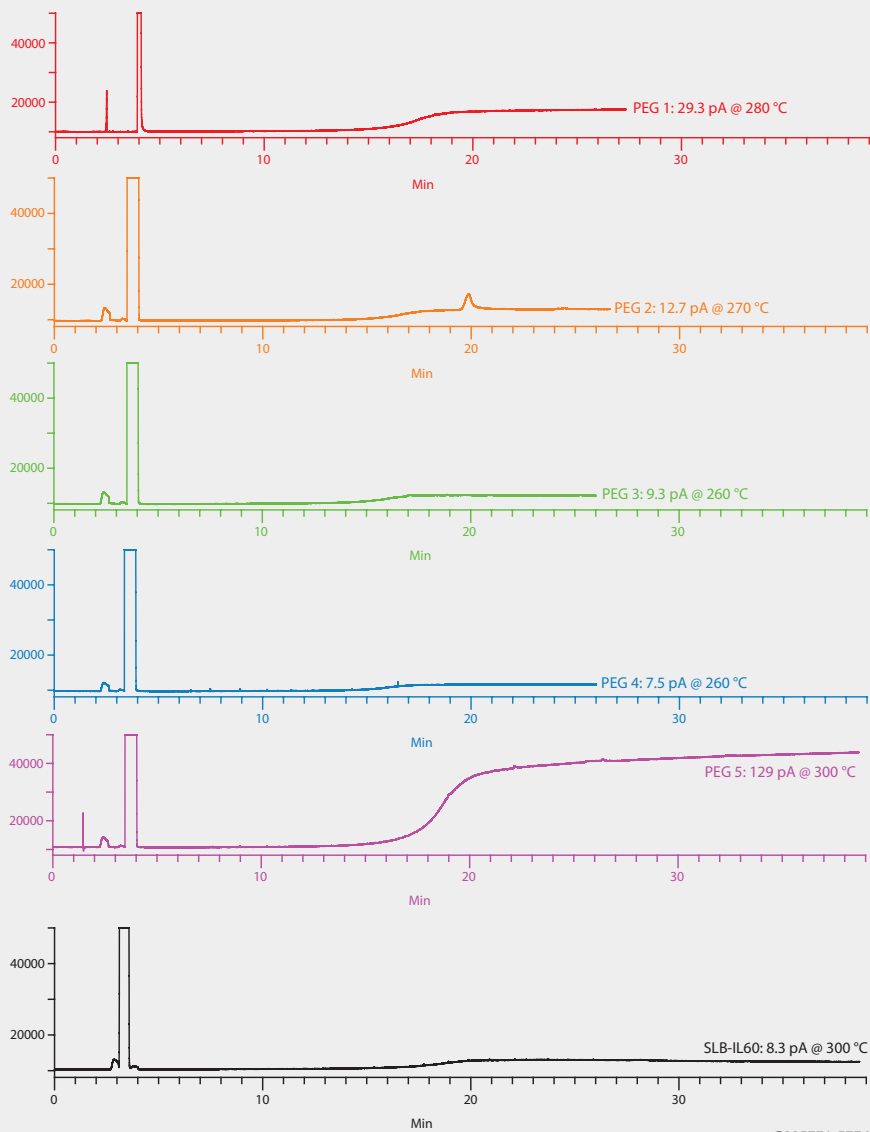
For updates, visit [sigma-aldrich.com/il-gc](http://sigma-aldrich.com/il-gc)

## Related Information

For more information on the SLB-IL60 and other ionic liquid columns, visit [sigma-aldrich.com/il-gc](http://sigma-aldrich.com/il-gc)

### Figure 1. FID Bleed Chromatograms

PEG columns: 30 m x 0.25 mm I.D., 0.25  $\mu$ m  
 SLB-IL60 column: 30 m x 0.25 mm I.D., 0.20  $\mu$ m (29505-U)  
 oven: 50 °C (2 min), 15 °C/min to column programmed temperature limit (10 min)  
 inj. temp.: 250 °C  
 carrier gas: helium, 1 mL/min  
 detector: FID, at column programmed temperature limit  
 injection: 1  $\mu$ L, splitless  
 liner: 4 mm I.D., split/splitless type, single taper wool packed FocusLiner™ design  
 sample: methylene chloride



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