5 Enhanced Methods for Calculating Noise Using SuperChems™ v10.5

2021-10-06 - Corporate Communications - Comments (0) - News

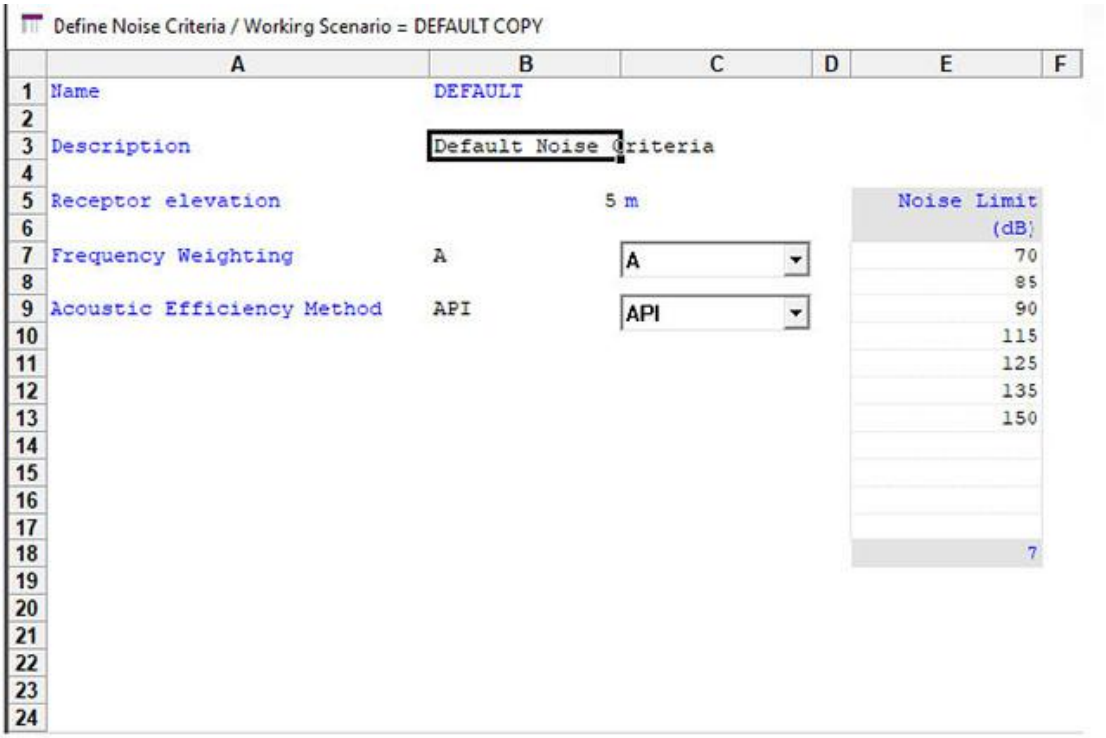
What are the consequences of noise emissions? The conversion of flow mechanical energy to noise can lead to possible fatigue failure of relief and/or process piping, and potential hearing loss or damage. The costs for additional piping supports and engineering may also increase. Noise can have a negative impact on workers, such as hearing loss, physical and psychological stress, and reduced productivity. Noise can also interfere with plant communication, and contribute to accidents and injuries by making it difficult to hear warning signals.

Process Safety Office® SuperChems™ v10.5 users now enjoy enhanced methods for calculating sound power level and sound pressure level (noise):

1. Sound power level is calculated for single phase and multiphase flow in complex piping geometries
2. Sound pressure level is calculated for single phase and multiphase discharges to atmosphere from process and/relief systems piping
3. Multiple sound pressure levels frequency weighting options are available (A, B, C, D)
4. Multiple acoustic efficiency methods are available (API, IEC, and ASME)
5. Sound pressure levels can be calculated at specific frequencies or over the entire frequency range with atmospheric attenuation

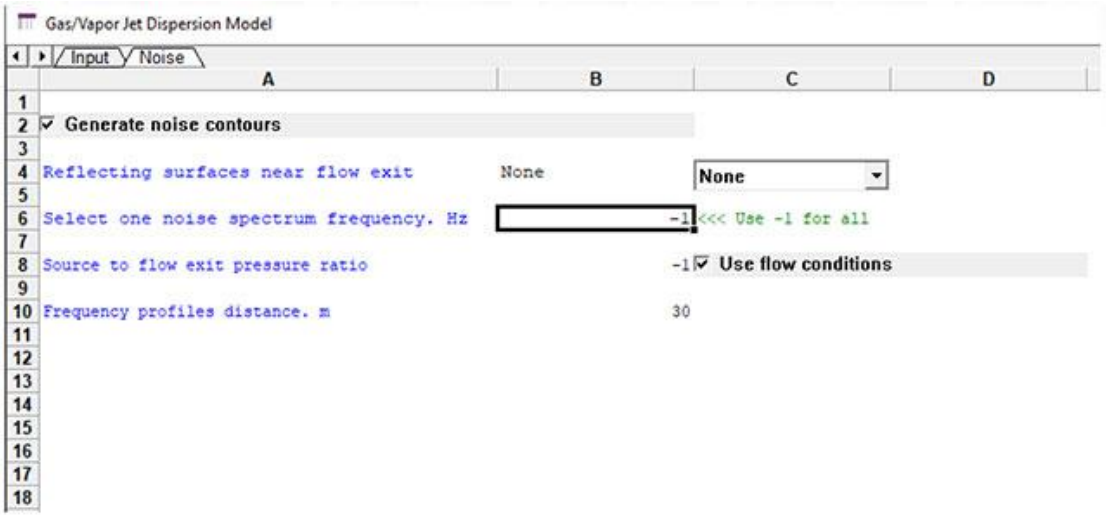
Flexible Noise Options Added

The noise definition object adds acoustic efficiency and frequency weighting options to sound pressure level. The A weighting frequency scale is widely used, as it shows the best correlation between sound pressure level and potential hearing damage.



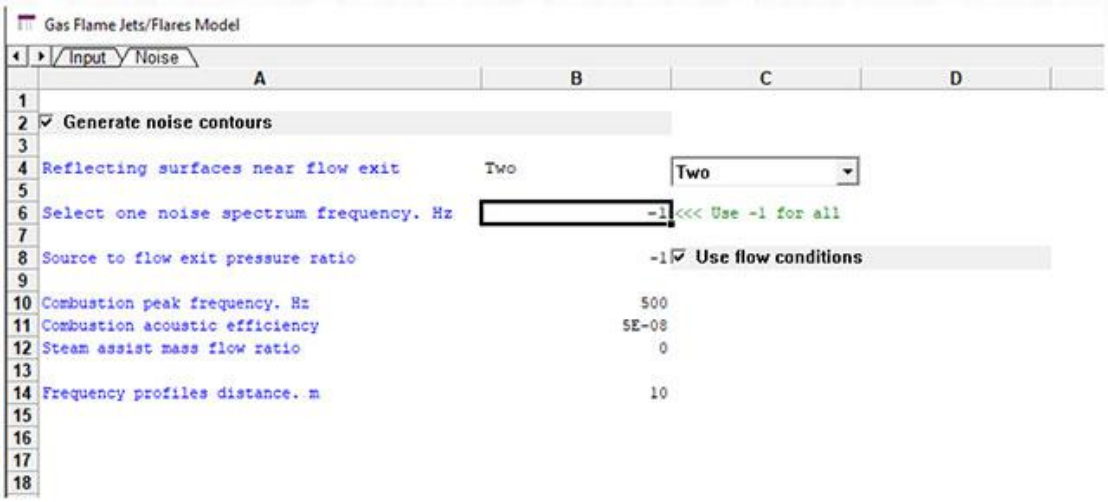
New Enhancements for Jet Noise

SuperChems™ single phase and two-phase jet models include the new enhancements.



New Enhancements for Flame Jet Noise

SuperChems™ single phase and two-phase flame jet models also include the new enhancements.



New Reporting Enhancements

A noise summary is added to all the jet and flame jet models with exposure time limits highlighted.

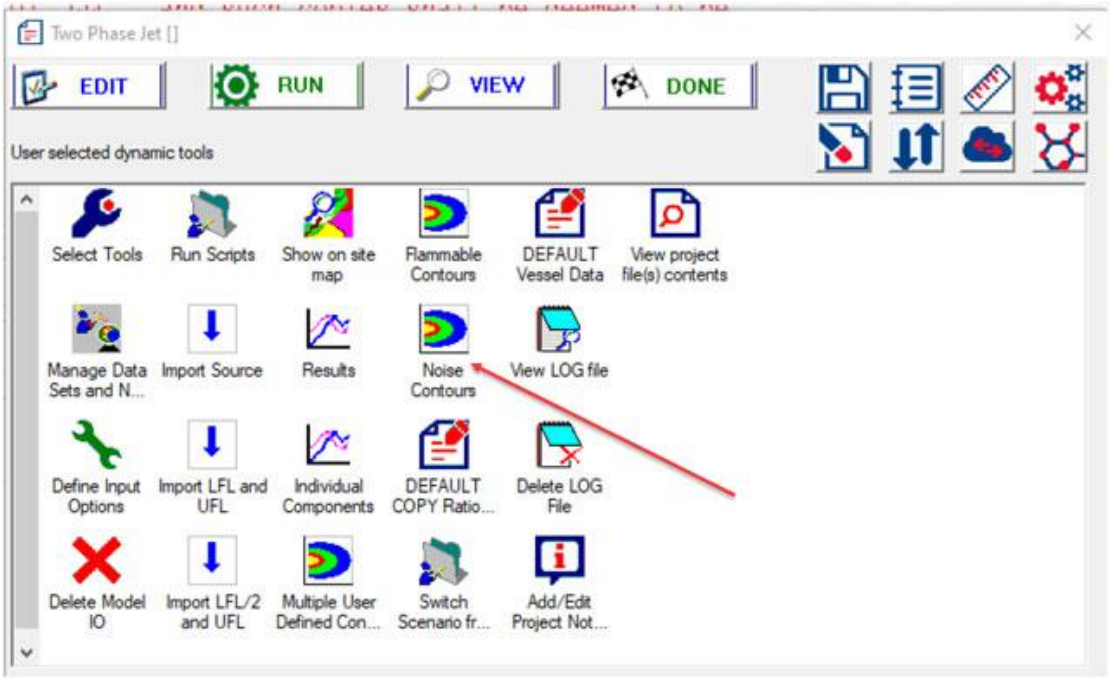
Two-phase jet

Results Summary | Noise Summary

	A	B	C	D	E	F
1						
2	Downwind Distance. m	Crosswind Distance. m	Elevation. m	Sound Pressure Level. dBA	OSHA Maximum Allowable Exposure Time. hr	Duration Check
3	5.00	0.00	0.00	116.70	0.20	Exceeded
4	10.00	0.00	0.00	114.64	0.26	Exceeded
5	50.00	0.00	0.00	103.26	1.27	Ok
6	100.00	0.00	0.00	97.05	3.01	Ok
7	200.00	0.00	0.00	90.48	7.48	Ok
8	300.00	0.00	0.00	86.42	13.14	Ok
9	400.00	0.00	0.00	83.41	19.95	Ok
10						
11	Sound Pressure Level. dBA	Distance. m	OSHA Maximum Allowable Exposure Time. hr	Duration Check		
12	70.00	1239.36	128.00	Ok		
13	85.00	344.27	16.00	Ok		
14	90.00	210.30	8.00	Ok		
15	115.00	12.61	0.25	Exceeded		
16	125.00	1.00	0.06	Exceeded		
17	135.00	1.00	0.02	Exceeded		
18	150.00	1.00	0.00	Exceeded		
19						
20						

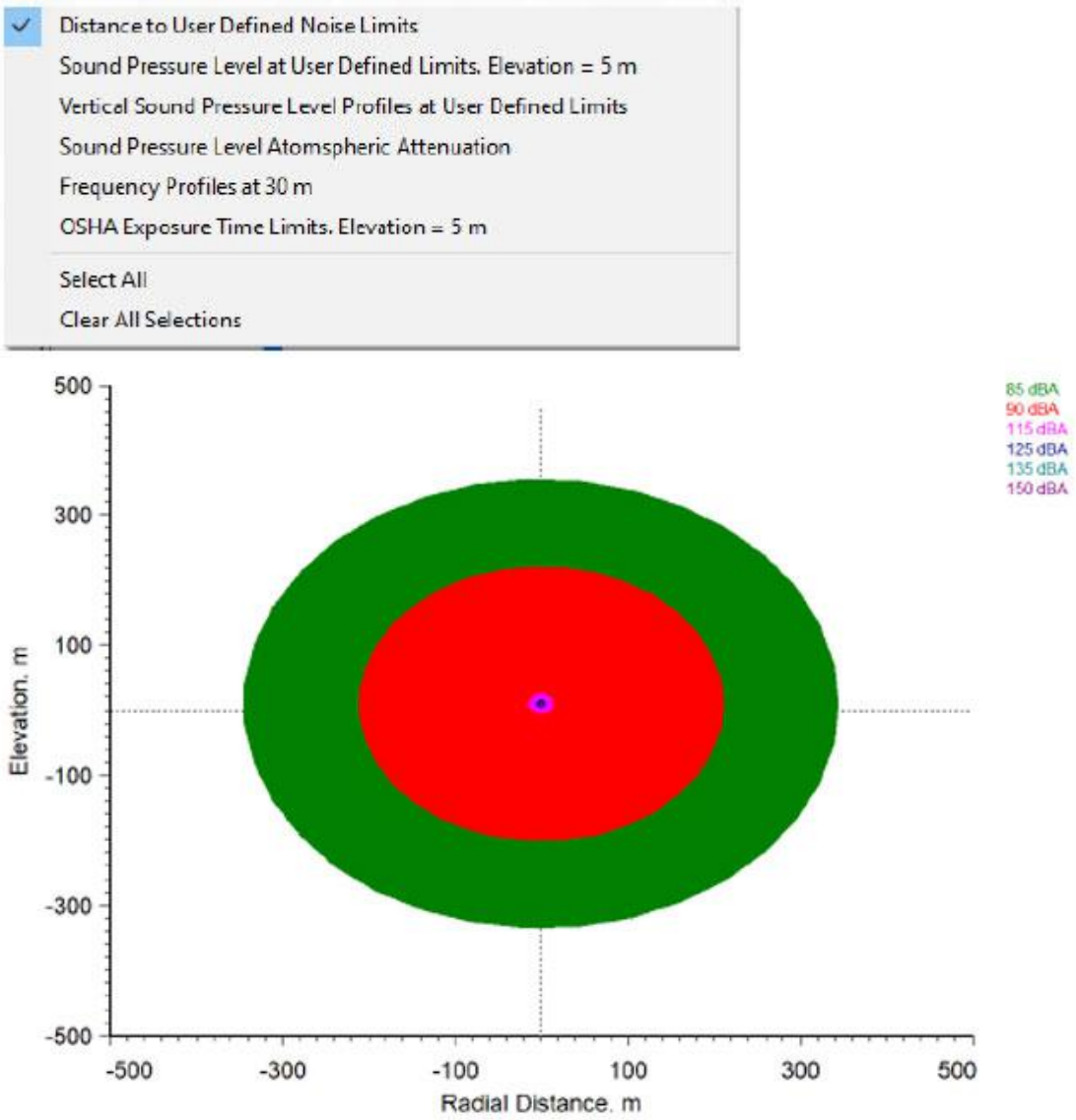
Additional Visual Tools

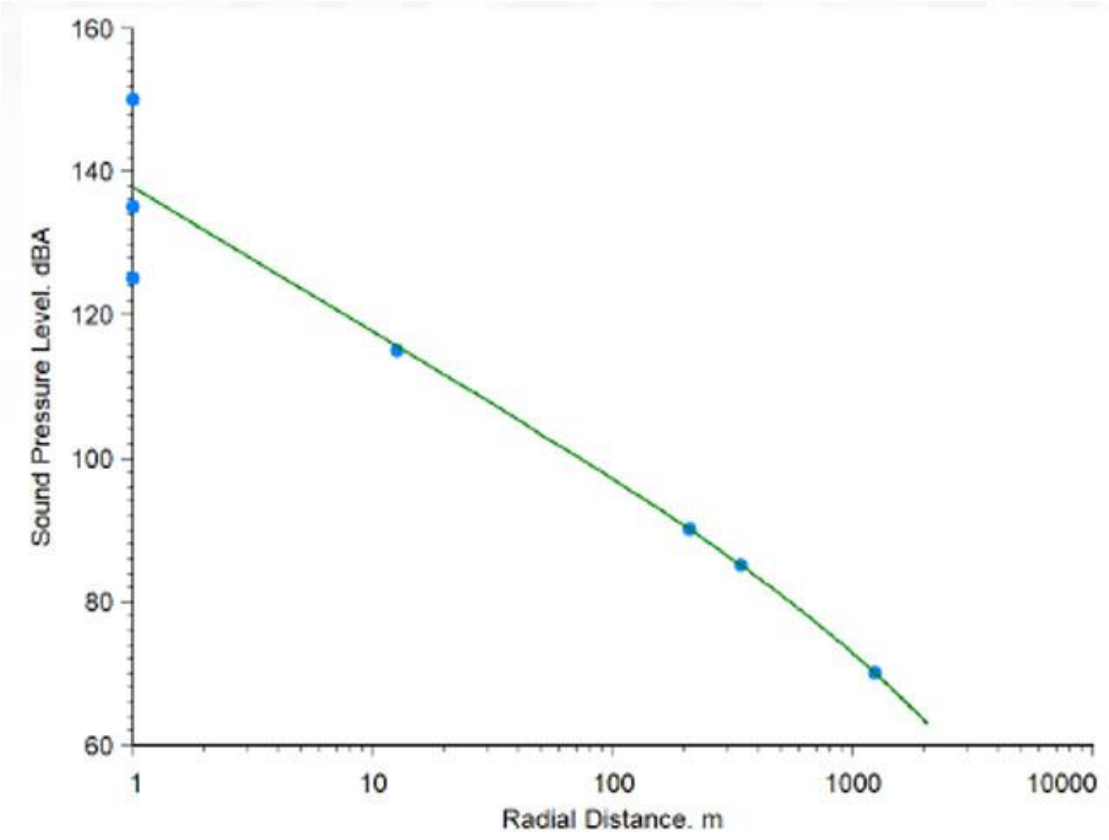
Noise contours display options are provided for all the jet and flame jet models.

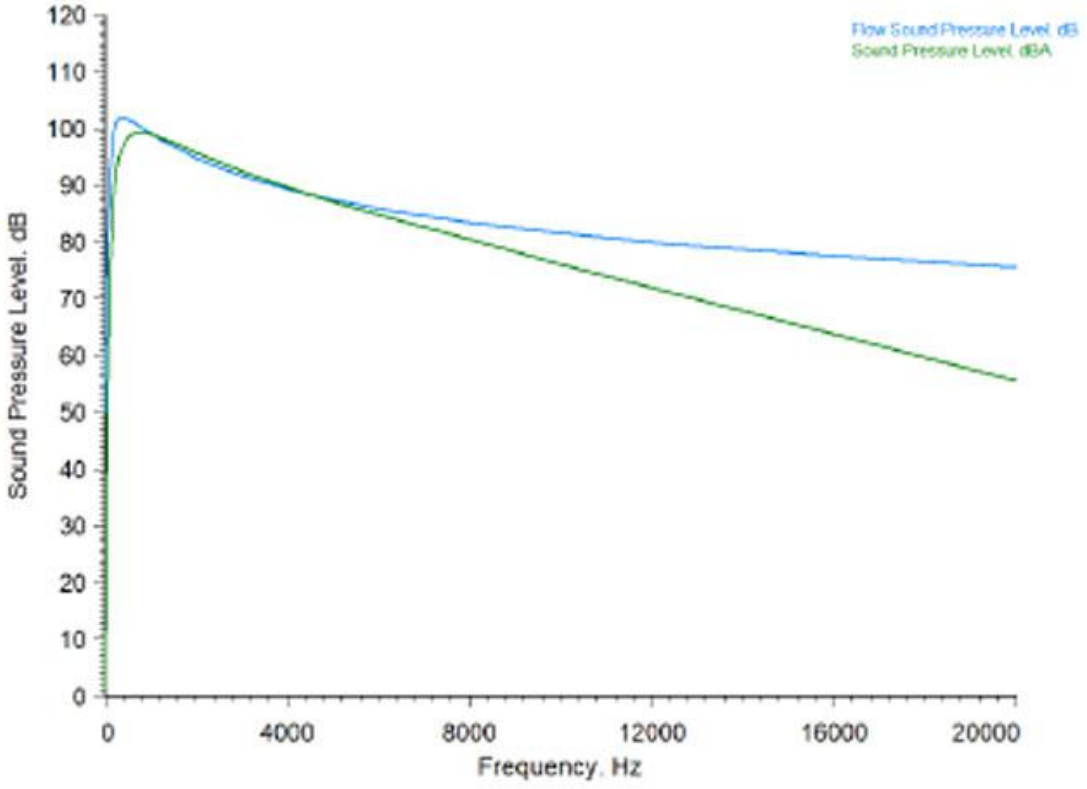


Drill Down into Noise Sources and Attenuation

The noise contours provide multiple displays including vertical profiles, frequency profiles, and attenuation.


Distance to User Defined Noise Limits
Sound Pressure Level at User Defined Limits. Elevation = 5 m
Vertical Sound Pressure Level Profiles at User Defined Limits
Sound Pressure Level Atomspheric Attenuation
Frequency Profiles at 30 m
OSHA Exposure Time Limits. Elevation = 5 m
Select All
Clear All Selections
85 dBA
90 dBA
115 dBA
125 dBA
135 dBA
150 dBA
500
300
100
-100
-300
-500
Elevation. m
-500
-300
-100
100
300
500
Radial Distance. m





Questions?

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