



# MASTERLINE 8

SoftTone



NATURAL  
COOLING

ZERO  
ENERGY USE

ACOUSTIC  
COMFORT

Increasing urbanisation has meant an upturn in the construction of high-rise and tall buildings, with an aim to restore confidence in city centre living for the growing and working population.

Designed by leading architects and specifiers as multi-purpose buildings, new developments can create a sense of community, while also promoting the larger community around the building with pedestrian street traffic and transport hubs that benefits local businesses.

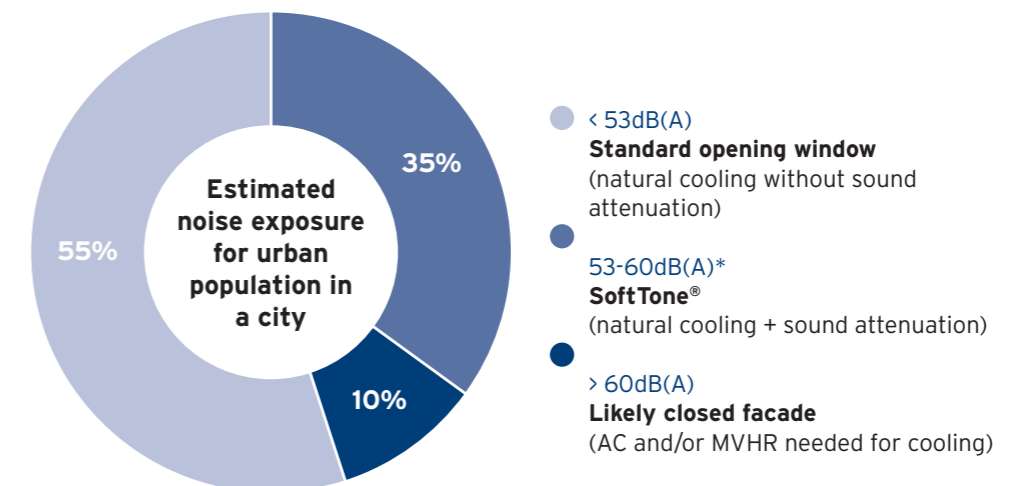
But one significant consequence for homeowners choosing this location and living style is the exposure to high levels of noise pollution through the day and night, that can have a significant impact on quality of life and well-being.

#### Masterline 8 SoftTone®

Reynaers has launched a new variant of its Masterline window series, which has been developed as a noise-reducing solution, allowing architects to appease aspiring city-living homeowners to still open a window and create a fresh indoor living experience.

SoftTone® is the result of the partnership between Arup - who developed SAFE (sound attenuating façade element) technology, and Reynaers. The result is a sustainable architectural solution for natural cooling and ventilation in urban environments

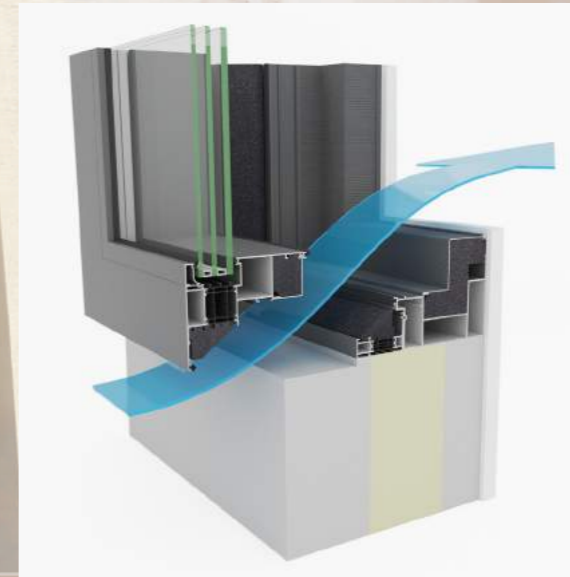
The parallel opening window units allow maximal ventilation and cooling, the SoftTone® components inside the window filter out the noise. This results in a fresh, healthy and relax working and living experience, even in the middle of a vibrant city.



\*internal sound level is then down to 33-40dB(A), noise risk level depends on local guidelines/legislation (UK → AVO guide)

## DESIGN DEVELOPMENT

## KEY ELEMENTS



The innovative new, adapted parallel opening window units allow maximal ventilation and cooling, while the SoftTone® components, fitted inside the window, are designed to filter out the noise.

This unique combination ensures there is no appreciable resistance for the airflow and a significant breaking of line-of-sight between the source of the noise and the building's user.

With the sound path lined exclusively with sound absorbing material, the result for architects working on tall buildings in the heart of a vibrant urban city, is to deliver a fresh, healthy and relaxed working and living experience.

The SoftTone® solution allows a significant increase in acoustic performance compared to traditional opening types. It ensures acoustic comfort in combination with natural cooling and ventilation in locations where this was previously impossible to achieve.

The solution is mainly designed for busy city centre living and commuter locations, where buildings are close to motorways, train stations and airports.

SoftTone® systems present a more sustainable and affordable alternative to mechanical ventilation and comfort cooling. Cool night temperatures are therefore an important aspect - ruling out some geographic areas.

# COMBINATION ACOUSTICS AND VENTILATION

# VENTILATION PERFORMANCE

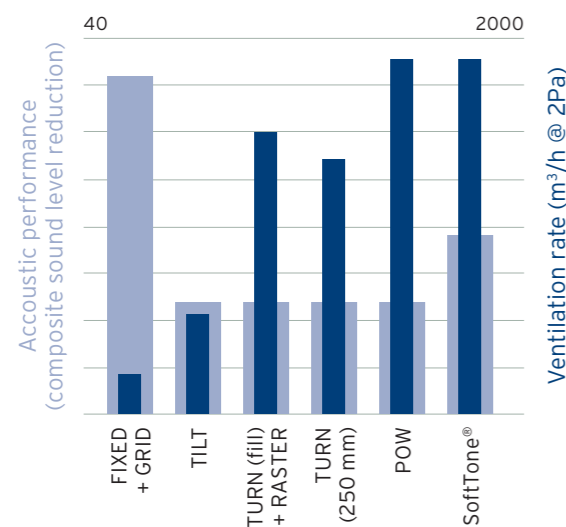
### SoftTone® is ideal for developments with:

- High ventilation / cooling specifications
- Sustainable and economic energy use requirements
- Increased outside sound levels

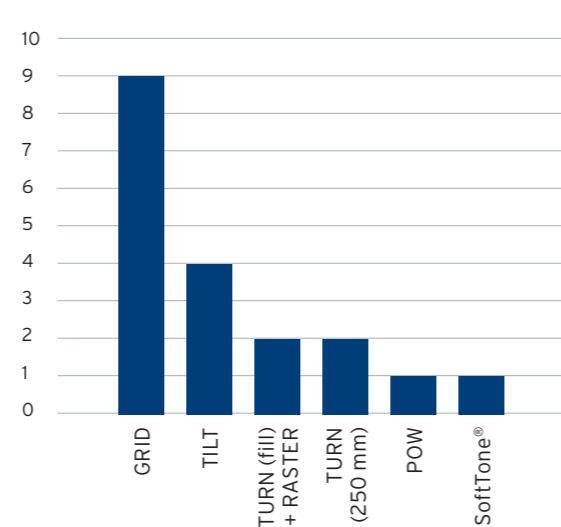
The graphs demonstrate the comparison between SoftTone® and other window types, illustrating its impressive cooling capacity and acoustic performance.

\*\*Source: Napier University Study 'ANR116: Open / Close Windows.' Comparing these results to Reynaers' own SoftTone® test results, acousticians concluded there is a 7db improvement in performance.

**Comparison between SoftTone® and other window types (Window size: W1230xH1480mm)**



**Units needed for equal ventilation (baseline SoftTone®)**



\*The acoustic performance of the tilt and turn windows is derived from the Napier University study 'NANR116: Open/closed windows'. Comparing these results to our own test results on the SoftTone® window, acousticians concluded there is a 7db improvement in performance in favour of SoftTone®.

SoftTone® offers a sustainable alternative to active cooling, offering a bigger open area, and a better air circulation, enabling passive natural ventilation.

This table demonstrates SoftTone®'s unique open area capability for a variety of window sizes.

GEOMETRIC OPEN AREA - AO (M²)*											
Window Width (mm)	800	900	1000	1100	1200	1300	1400	1500	1600	1700	
Window Height (mm)	1000	0.34	0.36	0.38	0.40	0.42	0.44	0.46	0.48	0.50	0.52
	1100	0.36	0.38	0.40	0.42	0.44	0.46	0.48	0.50	0.52	0.54
	1200	0.38	0.40	0.42	0.44	0.46	0.48	0.50	0.52	0.54	0.56
	1300	0.40	0.42	0.44	0.46	0.48	0.50	0.52	0.54	0.56	0.58
	1400	0.42	0.44	0.46	0.48	0.50	0.52	0.54	0.56	0.58	0.60
	1500	0.44	0.46	0.48	0.50	0.52	0.54	0.56	0.58	0.60	0.62
	1600	0.46	0.48	0.50	0.52	0.54	0.56	0.58	0.60	0.62	0.64
	1700	0.48	0.50	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66
	1800	0.50	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68
	1900	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70
	2000	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72
2100	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.74	
2200	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.74	0.77	
2300	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.74	0.77	0.79	
2400	0.62	0.64	0.66	0.68	0.70	0.72	0.74	0.77	0.79	0.81	
2500	0.64	0.66	0.68	0.70	0.72	0.74	0.77	0.79	0.81	0.83	
2600	0.66	0.68	0.70	0.72	0.74	0.77	0.79	0.81	0.83	0.85	

\*with throat of 100mm, and the window set back 105mm into the façade.

**Based on internal tests (window size 1230 x 1480mm, opened to its maximum position: 100mm throat), the coefficient of discharge (Cd) is:**

- 0.52 for a SoftTone® window set back 105mm in the façade.
- 0.63 for a SoftTone® window flush with the outer wall (equal to or better than a normal window)

**The airflow (Q) can be derived for any given pressure difference, from the following formula:**

$$Q = Cd \times Ao \times \sqrt{\frac{2 \times \Delta P}{\rho}}$$

For other project requirements (difference in window sizes, opening positions, building connections,...) please contact your Reynaers consult project manager.

## ACOUSTIC PERFORMANCE

## BUILDING CONNECTION

Table with Rw values for a variety of opening positions.

SOUND REDUCTION $R_w(C;Ctr)^*$			
Throat	20mm	50mm	100mm
Flush	17(-1;-3)	14(0;-2)	11(-1;-1)
Set back 105mm	18(-1;-3)	15(0;-2)	13(-1;-3)

\*Tested on a 1230x1480mm window,  $R_w$  wall = 45dB, wall 3900x2900mm.

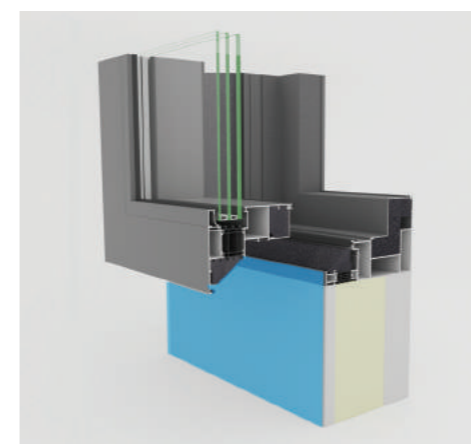
SOUND REDUCTION $R_w(C;Ctr)^*$			
Throat	20mm	50mm	100mm
Flush	17(-1;-3)	15(-1;-3)	11(0;-1)
Set back 105mm	19(-2;-4)	16(-1;-3)	12(0;-1)

\*Tested on a 1292x2000mm window,  $R_w$  wall = 45dB, wall 3900x2900mm.

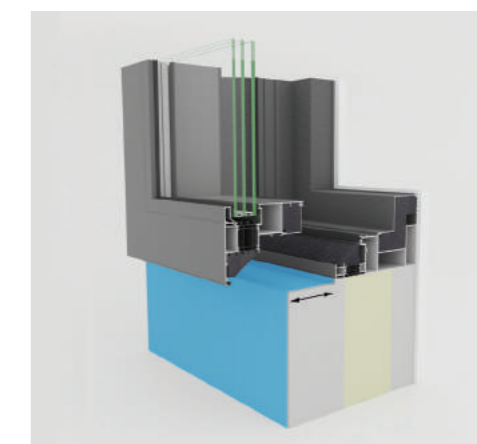
For individual project requirements, please contact your Reynaers' representative who would be happy to help.

Depending on where you are considering use of SoftTone®, there are several ways to install our specialist range.

Flush



Set back 105mm (+10mm step)



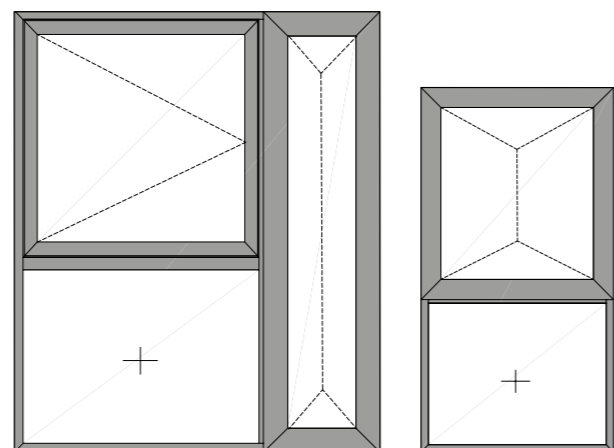
We have highlighted two alternatives as examples, with the flush installation resulting in better airflow. The 'set back' installation will provide a better sound performance in large openings.

## APPLICATION & DESIGN OPTIONS

### Configurations: what can be built?

SoftTone® is a parallel opening system based on Reynaers' specialist Masterline 8 Frame profile systems. This means SoftTone® can be integrated into a standard Masterline framework.

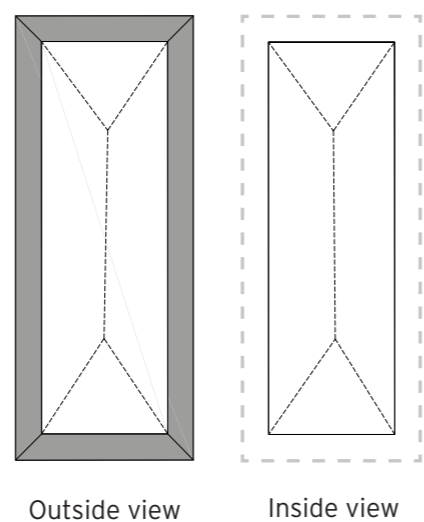
Fixed glazing or stand opening elements, can also be put 'side-by-side' with the SoftTone® POW 'cassette.'



### Wall finishing:

Please note it is not possible to cover the SoftTone® frames completely, when combined with other panels.

On a standalone SoftTone® window, whilst the aluminium profiles can be hidden on the inside of a building, they will stay visible on the outside.



### Colour choices:

In line with current trends, Masterline 8 SoftTone® can be painted in any RAL colour and finished in standard powdercoat, matt, metalised or coatex (rough surface) possible.

\*Please note that anodised finish is possible, with the exception of requirements for perforate sheets (ano-like paint is the recommended alternative.)

### Choice of hardware:

#### Handles

Touch and Horizon handles are available as standard. Other types possible but longer spindle is necessary.

#### Parallel hinges

Maximum load of 200kg  
Minimum dimensions (HxW): 1100 x 850mm  
Maximum dimensions (HxW): 2600 x 1700mm



# TECHNICAL OVERVIEW

## TECHNICAL CHARACTERISTICS

Opening type	Parallel outward opening	
Min visible width (mm)	Frame + sash	149
	Sash	124
	T-profile	47
Overall system depth (mm)	Frame only	227
	Frame + sash	237
Thermal break (mm)	PA6.6	40
Rebate depth (mm)	27	
Glass thickness (mm)	Min	11
	Max	44
Glazing method	Dry glazing with EPDM or neutral silicones	
Window height (mm)	Min	1100
	Max	2600
Window width (mm)	Min	850
	Max	1700
Window weight (kg/m perimeter)	Sash only (excl. glass)	4.5
	Frame + sash (excl. glass)	10**
Max weight (kg)	Sash (incl. glass)	200
	Throat (mm)	
Throat (mm)	Min	-
	Max	100*
Compatibility with other systems	Masterline 8	

\*Depending on local safety regulations, throat can be >100mm

\*\*Example: element size 1.7m x 2.6m = 8.6m perimeter = total weight ~86kg (excl. glass)

## PERFORMANCES

	Building connection	Performance	Element size (mm)
Air	Flush	High Class 4	1292x2000
Wind	Flush	E2400A	1292x2000
Water	Flush	E1200 (+ dynamic pulses)	1292x2000
Cyclic	Flush	Class 3 (20000)	1292x2000
Rw(C;Ctr) with 100mm throat (dB)*	Flush	11(-1;-1)	1230x1480
	Set back 105mm	13(-1;-3)	1230x1480
Rw(C;Ctr) closed window (dB)*	Flush	42(-2;-4)	1230x1480
Ventilation with 100mm throat @2Pa (m <sup>2</sup> /h)	Flush	2162 (Cd=0.63)	1230x1480
	Set back 105mm	1785 (Cd=0.52)	1230x1480
Uw (Ug=1.0, psi=0,034) (W/m <sup>2</sup> K)	Flush	1.3	1230x1480

\*with Rw glass = 45(-2;-6)dB, Rw wall = 45dB, wall size 3900x2900mm

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