



# AIR QUALITY AT SAS

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- At Shanghai American School, we know air quality is of the utmost concern. That's why we take multiple steps in our effort to maximizing the quality of our air, to help address air quality issues as best we can for our students, faculty, staff, and community.
  - We would like to share our approach to air quality so you can better understand the steps we take as a school.

# AIR QUALITY AT SAS: A SUMMARY

SAS continually monitors and responds to environmental fluctuations. These efforts reflect our ongoing commitment to proactive and strategic investments we make to maximize the quality of our air.

There are four key steps SAS has taken: Assess, Implement, Improve, and Involve.

- 1. To begin, we partnered with engineering consultants and environmental experts to conduct a study that assessed our facilities and air quality, and identified opportunities for improvement.
- 2. Next, we used the results of the study to launch a multi-phased implementation plan. This plan involves improvements to facilities, air handling systems, and even enhancements in the landscaping on campus.
- 3. Throughout our implementation, we have continually assessed the quality of our efforts and refined our approach to take advantage of advancements in relevant technologies. For example, a recent inquiry revealed the need for an air quality measurement system that broadens our scope of measurement beyond AQI or harmful particle matter (PM2.5), to include other elements such as carbon dioxide.
- 4. Lastly, we recognize the biggest variable to indoor air quality is a human one. Helping our community stay mindful of behaviors that affect air quality, such as limiting door openings or using doors with newly-installed vestibules, plays a meaningful role in improving the quality of our air.

Our intention is to meet or exceed all recommendations from the Shanghai Education Commission (SEC) related to outside air exposure to students. The air quality measures we've taken have put SAS at the forefront of schools in Shanghai.

Fortunately, we're not alone in our effort to improve air quality for our community. Due in part to local rules and restrictions,

- Dry carpet cleaning process implemented to replace wet process – greater reduction of dust, allergens and mold spores
- Replacement of exterior frameless windows with new double glazed framed design
- Replacement of old AHU's in Elementary School on Puxi and Pudong campuses with multistage filtration units
- Multistage filtration added to the Pudong PAC air handling system
- Landscape master planning exercise – Develop staged planting program
- Replacement of AHU's in Middle School on Puxi and Pudong campuses with multistage filtration units
- Replacement of Puxi High School AHU's with multistage filtration units (as part of the Puxi High School Science remodel project)
- Replacement of Pudong and Puxi (remaining balance) HS AHU's with multistage filtration units

Continued improvement plans in progress are as follows:

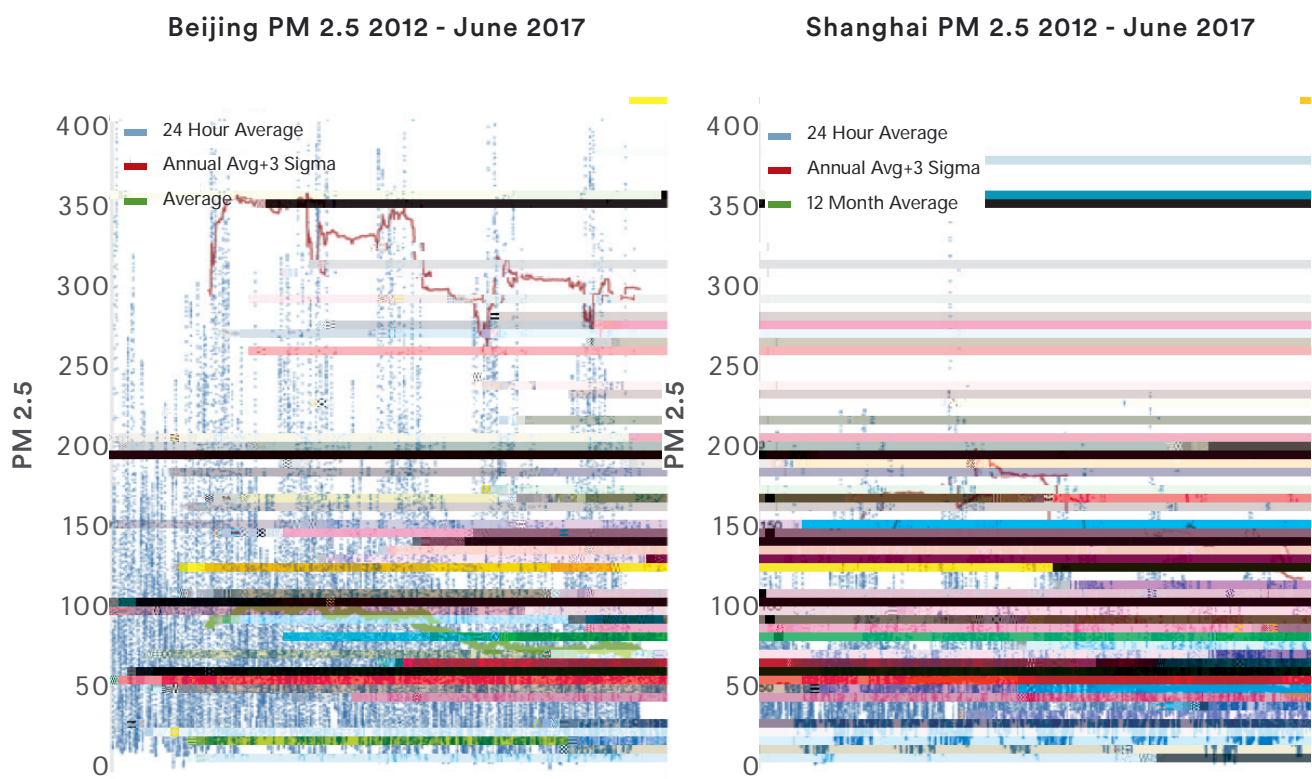
- Review and develop indoor plant program
- Replacement of common area AHU's with multistage filtration units
- Implementation of landscape master plan (Multiple Phases)

The graph above shows the typical pattern of indoor air quality relative to outdoor air quality, over a three day snapshot – the patterns and trends are similar for all divisions. The blue shaded areas indicate the school hours of 7:30 a.m. – 3:30 p.m. The red arrows show when our HVAC system activates at approx. 4:00 a.m. You will see that when the system turns on the interior AQI drops dramatically. The blue arrows show that even when the outdoor AQI is rising we are able to maintain and keep the interior AQI from rising. The peaks and valleys are related to the opening and closing of doors and the heating/cooling turning on and off to regulate temperature.

The measuring monitors purchased by the school are manufactured by a world leader in lab instrument design and contain the leading edge technology in the area of particle measurements. Unlike many inexpensive handheld devices, our units are factory calibrated to specific environments and require that they be sent to certified factory vendors who specialize in these units and meet global certification standards.

In an effort to continuously improve our data, the school is working with GAMS to explore additional monitoring efforts to offer more accurate, comprehensive data. This would include additional fixed monitors as well as floating monitors to identify air quality issues in “hot spots” or areas perceived to be problematic.

Regarding broader efforts undertaken by China, this graph shows the gradual improvement in air quality across Beijing and Shanghai over the past four years.



In addition to the above there are some simple behaviors that you as individuals can do to help keep IAQ (indoor air quality) at the best levels.

- Keep doors and windows closed during high AQI days
- Limit door open and closing time by staging student traffic flow between buildings
- Take indoor passage ways and skywalks whenever possible and encourage students to do the same
- Use exterior doors that have vestibules installed



**The AQI will be monitored consistently throughout the day.**

An automated system will generate restriction notices when the AQI reaches designated levels. This data will be collected and stored for historical reference.

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# CISSA GUIDELINES – China International School Sports Association (MS both campuses)

Practice:

Above 150 AQI = Modified

Above 200 AQI = Cancel

Games:

Anything above 150 AQI = Modified

AQI above 200 = Cancellation

2 p.m. is the cut off time for cancellation of matches via phone call.

On actual Cross River Event day the pollution index is discussed at the coaches meeting. (See Handbook)

SAS OUTDOOR ACTIVITY RESTRICTIONS BASED ON AQI						
AQI Level	School Hour Activities 7:00 am-3:00 pm	ES, MS & HS SISAC Sports Practice	MS (CISSA) Games/ Tournaments	HS (SISAC) Games/ Tournaments	HS (APAC) Sports Practice	HS Sport Games/ Tournaments
0 - 150	No Modifications	No Modifications	No Modifications	No Modifications	No Modifications	No Modifications
151 – 200	PE modified or moved indoors	Activities MODIFIED	Activities MODIFIED	Activities MODIFIED	Activities MODIFIED	Activities MODIFIED

# SISAC GUIDELINES – Shanghai International Schools Activities Conference (HS both campuses)

For regular season games/matches 200 AQI will be the reading to postpone SISAC outdoor fixtures. This must be communicated by phone/text/email by 2pm on a given day. All attempts will be made to reschedule the games/matches; if unable the result will be a tie (recorded as a draw for league standings).

- For air quality between 150-200 AQI we recommended making adjustments to the length of matches to help reduce sustained exposure (I.e. playing quarters, 30 minutes halves and/or providing longer halftime). If a competing school chooses not to compete with air quality between 150-200 AQI all attempts will made to reschedule the games/matches, if unable to reschedule, the result will be a forfeit charged to that school. (Recorded as a loss and 0 points for league standings)
- For Tournaments/weekend fixtures Air Quality will be checked at the coaches meeting or pre-game and monitored throughout the day to gauge whether a tournament/game needs to be delayed/postponed/modified.
- The Smartphone application 'Air Quality' will be used as the measure gauge for this reading. The host's closest measuring station will be used to gain this figure.
- <https://itunes.apple.com/hk/app/air-quality-china/id526226016?mt=8>.

China Standard Real time readings will be the default setting for the SISAC league structure.

Air Quality Index (AQI)	PM2.5 Health Effects Statement	PM2.5 Cautionary Statement
Good (0 - 50)	PM2.5 air pollution poses little or no risk.	None
Moderate (51 - 100)	Unusually sensitive individuals may experience respiratory symptoms.	Unusually sensitive people should consider limiting prolonged outdoor exertion.
Unhealthy for Sensitive Groups (101 - 150)	Increasing likelihood of respiratory symptoms in sensitive individuals, aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly.	Active Children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
Unhealthy (151 - 200)	Increased aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary effects in general population.	Active Children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion. everyone else, especially children, should limit prolonged outdoor exertion.
Very Unhealthy (201 - 300)	Significant aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly; significant increase in respiratory effect al population.	Active Children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion. everyone else, especially children, should limit outdoor exertion.
Very Unhealthy (201 - 300)	Serious aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly; serious risk of respiratory effect al population.	Everyone should avoid all outdoor exertion.
Beyond		





Pudong Campus