



# Dhoolpet Kites design and aesthetics – A practical approach to preserve and sustain the tradition

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**Abstract:** Dhoolpet Hyderabad is the home of artisans who specialize in Ganesha idols and kites. Few families are still engaged in the craft of making paper kites. Designs are several decades old and know-how is passed from parents to children. Kite flying is a tradition and culture of Hyderabad. It is a seasonal sport during the Makara Sankranti festival around January 15<sup>th</sup> every year and usually, the season lasts for two months. Urbanization and high-rise buildings have drastically reduced the available space for flying kites. The Spread of mobile phones and video games has lured children away from outdoor sports leading to a lack of patronage for kite flying. Imported plastic kites and kite thread (manja) are capturing the market share and forcing traditional artisan families to abandon their craft. This paper attempts to document the aesthetic and design features of traditional Dhoolpet kites to preserve the rich tradition. The tradition of making and flying kites has a history dating back thousands of years. From an aerodynamics perspective, the study of the kites by the Wright brothers is a precursor to their invention of aeroplane. Kites apart from a sporting perspective, their study can inspire students and enhance their understanding of flying objects. This paper attempts to capture the design details from an aerodynamics perspective. Understanding parameters like wind speed and terrain can extend the kite flying season throughout the year. Detailed drawings given in the paper will help to make kites with locally available material. Encouraging new enthusiasts to take kite flying will go a long way in helping the artisans to produce more and preserve their traditional art. Kites with vibrant colors can also be used as wall murals and beautiful wall hangings can be designed. Incorporating handmade kites and kites designs as part of interior design will open new vistas to patronize the craft. This paper also documents the best practices around the world to encourage kite flying as a sport.

Keywords: Dhoolpet Kites, kite design, kite flying, the aerodynamics of kites, kite clubs, kite museums

## 1.0 Introduction

Kites have a long history dating back to 9500-9000 BC. Modern paper-based kites were invented in China and spread to other parts of Asia (Wikipedia 2023).

There is a mention of kites in Ramayan too. Written accounts of the kite in ancient Indian literature can be found in the poetry of the thirteenth-century Marathi saint and poet, Namadeva and in TulsiDas Ramcharitmanas. (“A History of Kite Flying in India” 2020) (Kapoor 2019) (Shah 2023)

During the Mughal period, Kite flying transformed into a sport and fighter kites ‘Patangs’ emerged and are popular even today. During the festival of Makar Sankranti ( Month of January), kites are flown across India.

Dhoolpet is a locality situated in Hyderabad. It is home to artisans who migrated from northern parts of India several centuries ago. Artisan families are engaged in Plaster of Paris and clay Ganesh idols and kites.

Kite flying is traditional and part of Hyderabad culture. A few decades ago, during the Makara Sankranti festival ( Mid January every ) the skyline of Hyderabad used to be dotted with colorful kites. Both children and adults used to participate in the sport.

Dhoolpet artisans used to make good money due to the demand and patronage of their craft. Rapid urbanization has resulted in high-rise buildings reducing the open spaces available for kite flying. Television, mobile telephones, and video games are major attractions to children weaning them away from all outdoor activities including kite flying. Due to a lack of patrons, Dhoolpet kite makers are being forced to abandon their traditional craft and seek other avenues of employment.

This paper attempts to document traditional paper kites made at Dhoolpet to preserve the art form. Detailed dimensions are captured so that others can attempt to make them in the future. This paper presents the best practices prevalent across the globe that promote kite flying. Kites are colorful and aesthetic. They can be incorporated as an element in interior design and decoration. Few such design ideas are presented. This will open up new uses for kites apart from flying them and encourage artisans to produce more throughout the year. It is important to promote safe kite flying throughout the year based on wind speeds so that demand seasonality is reduced.

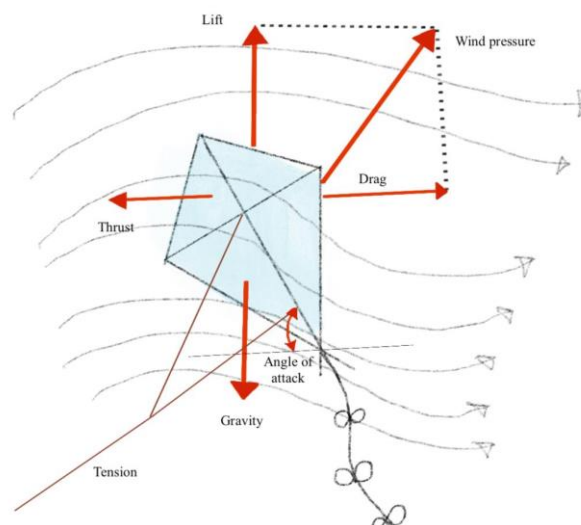
## 2.0 Fundamentals of Kites

Like an aeroplane, the kite is heavier than the air. The forces of flight –Lift, Weight, Drag, and Thrust affects the kite. Lift is the upward force that is responsible for the flight of the kite. Lift is generated by differences in air pressure due to the motion of air over the kite body. Kites are designed in such a way that angle and shape of the kite body result in the air over the top of the body moving faster than over the bottom. The pressure of air or any fluid decreases as the fluid speeds up. The pressure above the kite is less than the bottom surface due to the difference in the speed of air and this causes the lift and makes a kite fly. The flight of the kite can be explained using Bernoulli's Principle.

Bernoulli's Principle states that as the speed of a fluid increases, the pressure of that fluid will decrease. In a kite, air currents split as they pass over the leading edges of the kite. The air traveling over the kite surface moves more quickly than the air moving under the kite surface, resulting in a pressure difference, with lower pressure on top of the kite and higher pressure underneath. The area of higher pressure underneath pushes the kite into the lower-pressure area, causing the kite to lift into the air

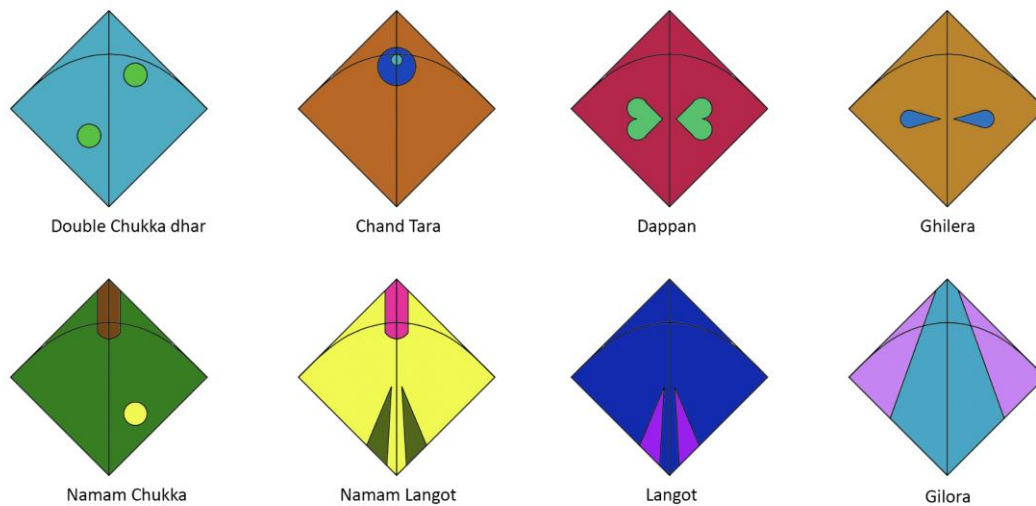
Thrust is the forward force that propels the kite in the direction of motion. Tension from the string and moving air create the thrust. To launch a kite into the air the force of lift must be greater than the force of weight. To keep a kite flying steady the four forces must be in balance. Lift must be equal to weight and thrust must be equal to drag. The design and expertise of the kite flier along with wind speed and direction are important parameters that determine the flight of the kite. The following diagram explains the forces acting on a kite. ("Bernoulli's principle", n.d.) (Hulslander, n.d.) (Feder, n.d.)

Wright brothers studied the aerodynamics of kite flight before inventing aeroplane. Understanding of types of kites and building them can give students a deep insight into aerodynamics and flying objects. The following documents published by NASA provide deep insight into the subject ("Sankranti: A Sky Full of Kites" 2023) (Hall 2021) (Nancy 2021)



### 3.0 Dhoolpet kites

Dhoolpet kites are in different sizes, design patterns, and color schemes. Types covered in this paper are not exhaustive but an attempt is made to capture the most popular designs. Names of the kites are a combination of Telugu and Urdu with few English words reflecting the multi-lingual culture of Hyderabad.

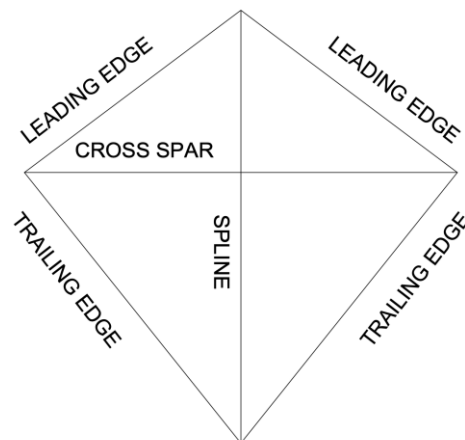


As Dhoolpet kites come in various designs, the kites are often named as per the different design like : Namamdar, Namam Langot, Guddi dhar, Guddi langot, Banin dhar, Dappan, Dappan langot, Pattidar, Chand tara, Ghilera, Dulha, Dulhan and many more.

### 3.1 Geometry of Dhoolpet Kites

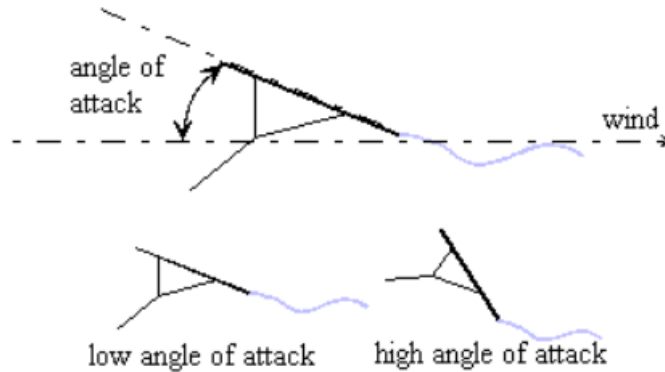
Dhoolpet kites in terms of geometry are orthogonal quadrilaterals i.e, diagonals of the kite are at right angles. These kites are ‘doredaar’ in local terminology indicating thread lining on all sides to make kites sturdy and improve flight parameters (“Kite (geometry)” 2022).

These kites can be classified as flat kites.

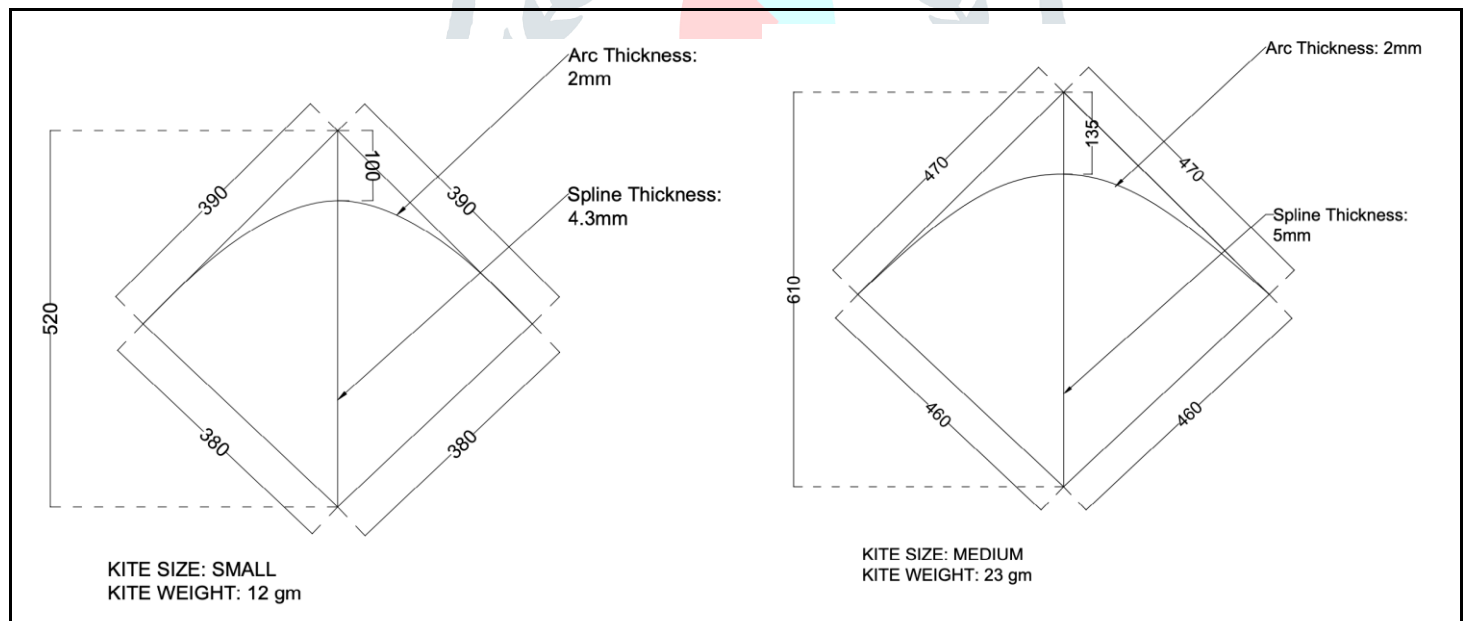


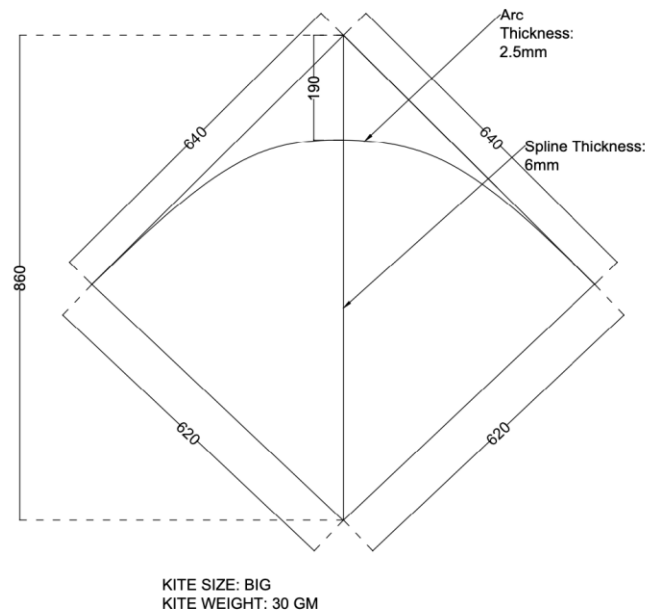
Spar is the name of sticks that act as the kite's skeleton and give its shape and form. The spine is the vertical spar that runs from the top to the bottom of the kite. Cross-spar is the spar that runs horizontally and forms the wing of the kite. The bridle is the thread that connects the kites to the kite flying line or kite thread. It is connected to the kite in two places. The point where the

flying thread gets attached to the bridle is called the bridling point. The bridle controls the angle of attack or the angle at which the kite meets the wind. A low angle of attack makes kites fly vertically above the flier. A high angle of attack enables kites to catch more wind and make the kite fly when wind speeds are low. While a low angle of attack facilitates flying when wind speeds are high.



The following drawing captures the dimensional details of three types of Dhoolpet kites-Small/Medium/Large. The color and aesthetic patterns are additions that will create a different type of kite. However, the dimensional details remain the same.





#### 4.0 Best practices to promote kites

This paper attempts to document best practices adopted across the globe that encourage the usage of kites not only for flying but also as a teaching tool for students and aesthetic decoration elements.

- Kite workshops for students-kites can be a great educational tool to teach students aerodynamics and the physics of flight. It can inculcate the spirit of DIY do-it-yourself culture when students make them in a classroom (Batchelor, n.d.).

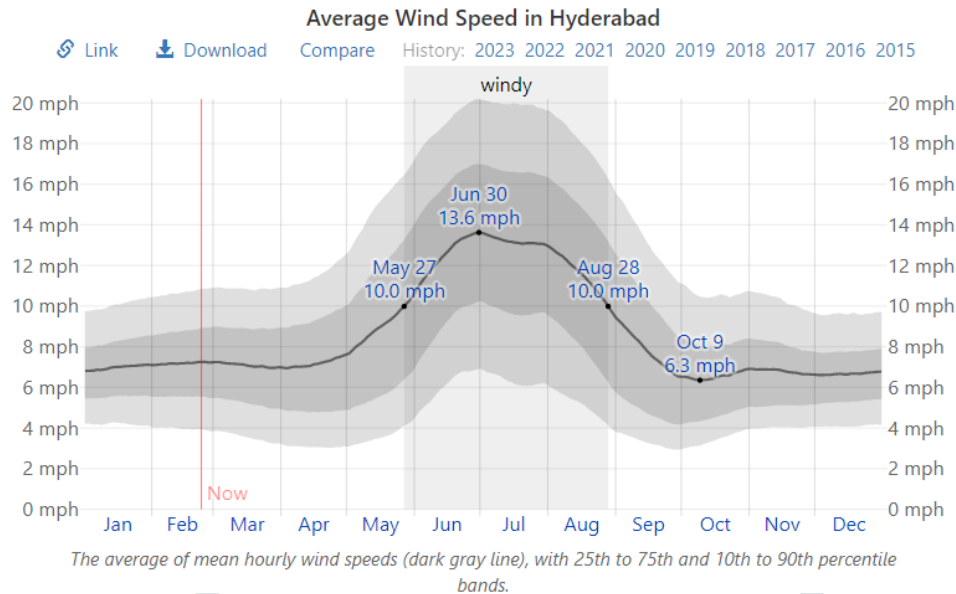
Encouraging the establishment of kite clubs in the school will encourage them to build kites and understand the physics of flight.

- Kite Energy: Few entrepreneurs believe that kite of great potential to harness winds above the earth to generate electricity. Technology is still new and people are optimistic about getting results. It is very important to inculcate scientific curiosity and temperament to come up with out-of-the-box thinking and innovation (Dutta, n.d.).

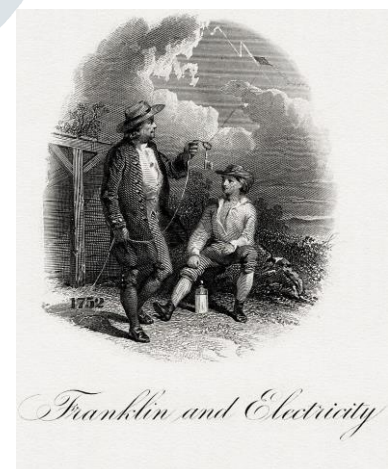


- Kites were employed for military applications. Control line aero modeling is an extension of kite flying. Building model aircraft and drones is an exciting hobby that can bring new innovations (“Control line” 2022).

- Traditionally in Hyderabad kites are flown for a month in January as part of the Makara Sankranthi festival. However, wind speeds are conducive throughout the year for kite flying. The following image gives the annual wind speed pattern at Hyderabad. Wind speeds peak in June (“Hyderabad Climate, Weather By Month, Average Temperature (India)” 2023)



- Lakeside kite flying:** Designating open places and lakesides will encourage people to fly kites safely. Flying kites near the lakes is a new trend and it can be better organized with all safety measures (“Hyderabad Climate, Weather By Month, Average Temperature (India)” 2023).
- Kite Museums:** Ahmedabad in Gujrat State of India has an excellent kite museum. Establishing similar kite museums can go a long way in encouraging enthusiasm among people toward the art and sport of kites (“Kite Museum Ahmedabad Tourism 2023”, n.d.).
- Kite Flying and safety:** Like any other sport or outdoor activity kite flying has accident risks. Kite flyers tend to do many experiments with material especially ‘kite dog fights’ which are common in India, thread coated with glass powder called manja is used to fly kites hurting the flyer and bystanders. Benjamin Franklin used kite experiments to prove the electric nature of lightning (Gupton 2017).



Attempts to replicate this experiment have led to fatal accidents elsewhere (“Kite experiment” 2023). In India, many accidents related to kite flying are reported every year (Jhangiani 2022).

Forming kite clubs and preparation of safety instruction manuals is important to promote safety. Protective equipment like gloves, and protective glasses can be used to enhance safety during Kite Flying. Initiating new enthusiasts under the supervision

and coaching of expert flyers like in any other sport will ensure the safety of all kite flyers. Flying kites in designated open public places will avoid accidents and hurting innocent bystanders (Abbas 2023).

#### Kites in interior decoration and furniture

Kite theme-based wall hangings and other artifacts are fast catching the imagination of people. Encouraging the use of such elements will go a long way in encouraging the artisans (“Kite Shape Wall Hanging”, n.d.).



*Kite composition as Interior aesthetic element (Photographed by: Kamakshi M.K)*



*Miscellaneous Composition of pictures showcasing Kites as an aesthetic element as decor (“Kites decoration”, n.d.)*

## 5.0 Conclusion

Rapid urbanization and lifestyle changes are reducing the patrons for traditional art and articles. Artisan families at Dhoolpet are involved in the manufacturing and trade of paper kites. The rapid decline in their products is forcing them to abandon their trade. This paper has documented the traditional Dhoolpet kite designs using CAD techniques to preserve the design concepts. Revival of traditional arts can happen only when there is sustained interest and demand for the products of artisans. Kites apart from a sporting perspective, are a great educational tool for students and they can be incorporated into an interior decoration for their aesthetic value. This paper has documented a few such concepts and best practices to revive the interest of people to patronize kites.

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