



## Asia not so far away from CMS – HINDUSTAN A.L. trusted in CMS high speed technology.



Hindustan Aeronautics Limited (HAL), Asia's premier aerospace company, having 16 production units, 9 Research centres at 7 locations across INDIA, envisages a road map to establish state-of-the-art manufacturing facilities to cater to increasing demands of their internal & International aerospace customers.

The Company has an impressive product track record - 12 types of aircraft manufactured with in-house R&D and 14 types produced under license. HAL has manufactured 3550 aircraft (which includes 11 types designed indigenously), 3600 engines and overhauled over 8150 aircraft and 27300 engines. HAL has been successful in numerous R&D programs developed for both Defence and Civil Aviation sectors. HAL has made substantial progress in its current projects:

- Dhruv, which is Advanced Light Helicopter (ALH)
- Tejas - Light Combat Aircraft (LCA)
- Intermediate Jet Trainer (IJT)
- Various military and civil upgrades: Sukhoy m30 MKI, MiG 27M, MiG 21 Variants

HAL Aircraft Division is also involved for production of components for different aerospace programs:

- BOEING, USA
  - Uplock box assy. for Boeing 777
  - Over wing exit doors for Boeing 757
  - To MHI Japan Bulk cargo door for Boeing 767
- AIRBUS, FRANCE
  - Forward passenger doors for Airbus A320
- BAE SYSTEMS, UK
  - Jaguar airframe spares

Considering their long experience in aerospace activities, they are considered Leader Company in this market. Its long experience in this field let them be a leadership company for the construction of components for aerospace applications. HAL devises their specifications of CNC machine to High dynamics, High acceleration, and Simultaneous 5 axes machining capabilities, better accuracies, and surface qualities. More critically, TWIN ram with each ram housing two axes spindle for their specific needs of machining of identical or mirrored aerospace structural components. HAL emphasised the need for prominent features such as High speed machining, high degree of flexibility, higher economics in cost per component.

CMS responded with top-of-the line Poseidon series in the concept of Gantry design with TWIN ram, each housing powerful 2 axes spindle, with spindle characteristics of 30 KW, 70 Nm, faster feed rate with Higher acceleration, ideally suiting to high volume materials removal associated aerospace Industries worldwide. The machine virtually has 9 servo controlled axes thus offering complete flexibility, in handling any production exigencies of aerospace customers.

After careful evaluations on other competing machining solutions, HAL unanimously conferred the decision in favour of CMS, for design, supply of 7 CNC 5 axis machine along with proving of aerospace structural components on each machine to their satisfaction.

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On strict time schedules, CMS manufactured and installed 7 CNC profilers and also actually machined HAL components at the customer premises. Since the installation in January 2006, HAL witnessed drastic reduction in machining time of most components, some to the extend of 70-80%, while machining complex structural components, which previously required multiple set ups, on multiple machines. Main characteristics of the CNC machines:

- Nr. 2 Five axis machine X=10.000mm Y=3.800mm Z1/Z2=1.100mm twin independent spindle
- Nr. 3 Five axis machine X=6.000mm Y=3.800mm Z1/Z2=1.100mm twin independent spindle
- Nr. 1 Three axis machine X=6.000mm Y=3.800mm Z1/Z2=1.100mm twin independent spindle
- Nr. 1 Five axis machine X=4.500mm Y=2.600mm Z1=1.100mm single spindle
- Dedicated T slot table up 10m x 3m and customized vacuum over-table with pin references for correct clamping and alignment of the components.
- High capacity chips removal along the working table

All the machines are equipped with latest Fanuc 31iA5 full digital configuration and interfaced with CMS technical service via remote diagnostic. Following this collaborative efforts of CMS and HAL, HAL have confirmed repeat business, which is under execution now, besides CMS delivering machining solutions for a variety of HAL components on a regular basis in order to take this experience to new levels.