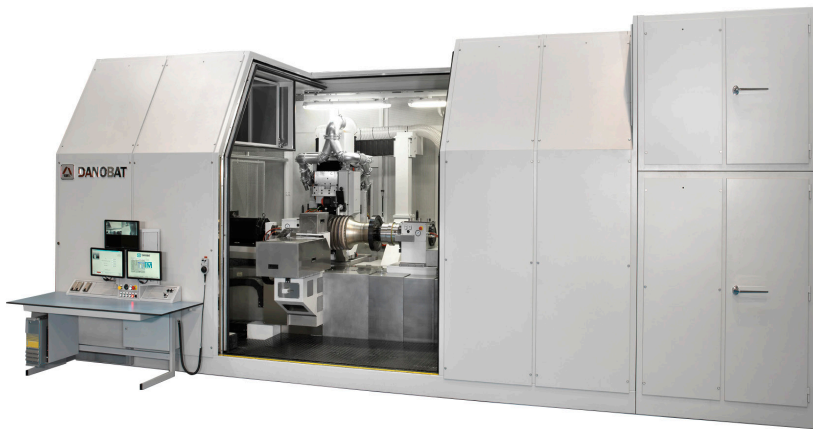




# DANOBAT

## mBTG - DANTIP

BLADE TIP GRINDING AND  
MEASURING MACHINES



The DANOBAT mBTG and DANTIP machine series are for precision grinding, deburring and measuring the blade tips of finish assembled engine turbine and APUs rotors. These machines, designed and developed by DANOBAT, grind the blade tips of the rotor while they are being spun at high speed, (up to 7000 rpm) thereby presenting the blades to the grinding wheel under the appropriate operating conditions. This feature ensures the highest degree of accuracy that can be obtained with current technologies.

It has been shown that diametric tolerances can be held to 0,025 mm (0.001"). This achievement is regarded as very important, because the clearance between the rotor blade tips and the outer housing has a critical bearing on the engines performance.

mBTG is typically used to grind and measure rotors such as CT7/T700, RTM322, CFM56, CF34, T64, TP400, F404 and J85 among others and DANTIP is used for large engine rotors.

These machines can be supplied forming "Match Machining Cells" with DANOBAT VG vertical grinders as a complete solution for match machining and measuring the rotors and casings of the same engine. The rotor blade tip grinder and the stator case turning/grinding machines interchange "data" to obtain dimensionally perfectly matched rotors and casings, thus optimising engine core performance and efficiency.

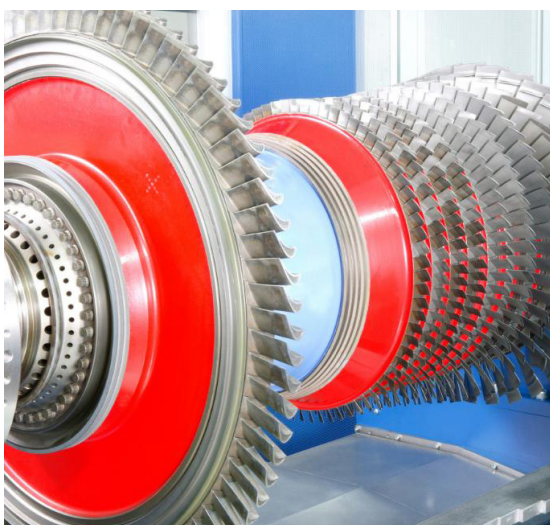


# mBTG - DANTIP

## BLADE TIP GRINDING AND MEASURING MACHINES

TECHNICAL CHARACTERISTICS		mBTG-400	mBTG-800	DANTIP R3
Grinding diameter (max.)	mm (in)	410 (16)	800 (32)	1500 (60)
Grinding length (max.)	mm (in)	600 (23 <sup>1/2</sup> )	860 (36 <sup>3/4</sup> )	1500 (60)
Component length (max.)	mm (in)	750 (29 <sup>1/2</sup> )	1400 (55)	2000 (78 <sup>3/4</sup> )
Component speed	min <sup>-1</sup>	10-7000	10-7000	10-4500
Wheelhead swivel	degrees	-10 / +200	-10/+200	-10/+200

### MACHINE TECHNICAL DESCRIPTIONS



#### High precision

- Optimal stability and rigidity achieved by natural granite and cast iron machine structures. The machine structure of mBTG machine is made in natural granite and cast iron whereas DANTIP bed structure is made in cast iron
- Movement of main machine linear axes is achieved by means of a linear motor on mBTG whereas it is via a high precision recirculating ballscrew and nut assembly with direct drive from a servomotor on DANTIP machines
- The complete working environment is temperature controlled

#### In-Process measuring

- In-Process gauging key for real time control of the grinding process to ensure optimized radius of blades for the best engine efficiency
- The dBTM measuring system is fitted to the machine for measurement of the rotor blades while being ground. Measurement can be either in-process or post process
- Compressor blades can be ground to Engine Manufacturer specifications quickly and accurately using the dBTM system for on-line gauge control. Blade radius measurements with 1 micrometer resolution while rotating at speeds up to 12,000 rpm can be obtained
- Since the dBTM system is capable of determining the radii without concern for tip reflectivity, the system does not need to be calibrated for each compressor blade type. Also, the dBTM system measures on each and every blade, providing radius data very quickly for real-time grinding purpose
- The measuring system hardware combines the highest speeds with outstanding sensitivity