



MACHINE TOOL GENOME PROJECT

Milling, at **40.2%**¹ of the total market, is the largest of all machining operations. There are **3053 models of CNC machining centers** from 229 builders². There are **3750 different workpiece materials**³. There are **110 manufacturers of cutting tools for milling** and **72 manufacturers of milling toolholders**⁴. Assuming an average of 500 stock keeping units (SKU's) from each cutting tool manufacturer and 100 SKU's from each toolholder company there would be over **4.5 Quadrillion (4,500,000,000,000,000)** potential combinations of tool/toolholder/machine/material, each with its own unique tool point frequency. This is far too fragmented and large to possibly compile and publish to a database or in a handbook. However, the actual data required for us to collect for the **Machine Tool Genome Project** numbers less than 70,000 entries, a very manageable and achievable number.

There have been 222,169 CNC machining centers sold to 78,646 companies in the U.S. since 1994⁵. Virtually all are still in use today. Cutting tools for milling are consumed at rate of \$951.2 Million per year in the United States with an additional \$200.7 Million spent on milling toolholders⁶. Using the accepted calculation of 3% of production is used for tooling⁷, milling operations account for \$38.4 Billion in domestic production. Should the **Machine Tool Genome Project** recover 30% in lost productivity, the potential cost savings and revenue from increased open time is **\$23 Billion per year**. Since a typical milling machine consumes 6.7 MWh per year⁸, the energy savings potential alone from the improved productivity would be 1.5 Trillion BTU's or **over 250 Billion Pounds of CO² greenhouse gases**, the equivalent of 55 million gallons of gasoline⁹. Since labor is estimated to be 31%¹⁰ of the cost of production, the recovered productivity and increased capacity would have the potential to save or retain over 200,000 manufacturing jobs¹¹. Counting the 4.15 jobs¹² created as spinoffs for each manufacturing job, **The Machine Tool Genome Project's** total employment impact potential is **over 1 million jobs in the U.S.**

The Machine Tool Genome Project is a joint effort of the University of Florida's Machine Tool Research Center, under the direction of Dr. Tony Schmitz, and BlueSwarf of State College, Pennsylvania, founded by Dr. Thomas Delio, Dr. Scott Smith and David Barton. <http://www.mmsonline.com/articles/the-online-optimizer>

¹ Dormer/Sandvik D.World n.01-2009

² Techspex.com, June 2, 2010

³ CutData, TechSolve

⁴ Techspex.com, June 2, 2010

⁵ Electronic Data Associates

⁶ 2010 Gardner Tooling & Workholding Survey

⁷ Kennametal 6050 Catalog, Page 66

⁸ Improvement Potential for Energy Consumption in Discrete Part Production Machines, Dept. of Electrical Engineering, Katholieke Universiteit Leuven, Belgium

⁹ Asknumbers.com

¹⁰ Kennametal 6050 Catalog, Page 66

¹¹ SimplyHired.com, June 26, 2010

¹² Boomtown USA, page 57