

Vacuum Market Segmentation

Rough Vacuum	Process Vacuum	Industrial Vacuum	Semiconductor Process Vacuum	Thin Film Deposition (non-Semiconductor)	FPD	Solar	Instrumentation Manufacturers	R&D
<u>Markets</u>	<u>Markets</u>	<u>Markets</u>	<u>Markets</u>	<u>Markets</u>	<u>Markets</u>	<u>Markets</u>	<u>Markets</u>	<u>Markets</u>
- Packaging (except food) - Central Vacuum - Printing and Paper Handling - Pick and Place - Conveying - Moulding - Air sampling - Medical	- Chemical (Bulk, Fine,...) - Petrochemical - Pharmaceutical - Plastics (Extrusion,...) - Food - Beverage - Textile - Paper - Ceramics - Freeze drying - Energy (Wind, Nuclear, Steam Turbines,...) - Central Vacuum	- Vacuum Metallurgy (Metal Degassing, Melting, Re-melting, E-beam welding, Casting,...) - Vacuum Heat Treatment (Brazing, Carburising, Nitriding, Quenching,...) - Laser Technology - Electron Tubes - TV Tubes - Lamps and Bulbs - Industrial leak detection - Refrigeration and Air Conditioning - Automotive (Dehydration, Charging and Test) - Electrical (Encapsulation,...) - Medical sterilisation - Batteries	- Silicon Semiconductor (Memory, Logic, MEMS,...) - Compound Semiconductor (LEDs,...) - Semicon Crystal Pulling <i>Please note: Above includes both Process Equipment Manufacturers and End Users for PVD, CVD, Etching, Ion Implantation, MBE</i>	- Glass/Web/Optical Coating - Optical Data Storage (CD, DVD, Hi Def Disk,...) - Magnetic Data Storage (HDD) - Thin Film Heads - Surface Coating (wear protection, decorative, ...)	- TFT-LCD Displays - Display Coatings (OLED, FED, PDP, SED,...)	- Photovoltaic Solar (c-Si & Thin-Film Deposition, Laminating,...) - Thermal Solar (Water Heaters,...) - Solar Crystal Growth (Pulling, Re-melt, ...)	- Mass Spectrometers - Electron Microscopes - Metrology/ Inspection/ Defect Review systems for Semiconductor including Focused Ion Beam systems and Electron Beam systems - Surface Analysis - Gas Analysis - X-Ray Analysis - MRI and NMR - Sample preparation (Driers, Centrifuges, Concentrators,...) - Leak Detectors - Medical accelerators (Linac, Synchrotron, Cyclotron...)	- Universities - Government Labs - Scientific Research Laboratories - Space Simulation
Typical operating pressure (mbar)								
> 1	> 10 ⁻²	10 ⁻² – 10 ⁻⁶	1 – 10 ⁻⁶	10 ⁻³ – 10 ⁻⁸	1 – 10 ⁻⁸		10 ⁻⁶ – 10 ⁻¹⁰	10 ⁻² – 10 ⁻¹¹
PVD:	Physical Vapour Deposition			CD:	Compact Disk			
CVD:	Chemical Vapour Deposition			DVD:	Digital Video Disk			
MBE:	Molecular Beam Epitaxy			OLED:	Organic Light Emitting Diode (or OLED: Organic Electro Luminescent Display)			
MEMS:	Micro Electro Mechanical Systems			FED:	Field Emission Display			
TFT-LCD:	Thin-Film Transistor Liquid Crystal Display			PDP:	Plasma Display Panel			
SED:	Surface Emission Display			MRI:	Magnetic Resonance Imaging			
HDD:	Hard Disk Drive			NMR:	Nuclear Magnetic Resonance			
FPD	Flat Panel Display							

This Vacuum Market Segmentation Chart was developed by the Working Group of the International Statistics on Vacuum Technology Program (ISVT), and is published with their permission. Organisations that participate in the program are the Association of Vacuum Equipment Manufacturers International (AVEM), the Japan Vacuum Industry Association (JVIA), the European Vacuum Technology Association (EVTA), and the Semiconductor Equipment and Materials International (SEMI).

Version 2021.1, ISVT WG meeting virtual via ZOOM, November 22nd 2021