1092. con't.

3. Equipment specially designed for the "production" or test of gas turbine brush seals designed to operate at tip speeds exceeding 335 m/s, and temperatures in excess of 773 K (500° C), and specially designed components or accessories therefore.
4. Tools, dies or fixtures for the solid state joining of "superalloy", titanium or intermetallic airfoil-to-disk com-binations described in 1095.3.a.3. or 1095.3.a.6. for gas turbines.
5. On-line (real time) control systems, instrumentation (including sensors) or automated data acquisition and processing equipment, specially designed for use with any of the following wind tunnels or devices:
   a. Wind tunnels designed for speeds of Mach 1.2 or more, except those specially designed for educational purposes and having a test section size (measured laterally) of less than 250 mm;
      Technical Note:
      Test section size: the diameter of the circle, or the side of the square, or the longest side of the rectangle, at the largest test section location.
   b. Devices for simulating flow-environments at speeds exceeding Mach 5, including hot-shot tunnels, plasma arc tunnels, shock tubes, shock tunnels, gas tunnels and light gas guns; **or**
   c. Wind tunnels or devices, other than two-dimensional sections, capable of simulating Reynolds number flows exceeding 25 x 10^6.
6. Acoustic vibration test equipment capable of producing sound pressure levels of 160 dB or more (referenced to 20 µPa) with a rated output of 4 kW or more at a test cell temperature exceeding 1,273 K (1,000°C), and specially designed quartz heaters therefore.
7. Equipment specially designed for inspecting the integrity of rocket motors using non-destructive test (NDT) techniques other than planar X-ray or basic physical or chemical analysis.
8. Transducers specially designed for the direct measurement of the wall skin friction of the test flow with a stagnation temperature exceeding 833 K (560°C).
9. Tooling specially designed for producing turbine engine powder metallurgy rotor components capable of operating at stress levels of 60% of ultimate tensile strength (UTS) or more and metal temperatures of 873 K (600°C) or more.

1093. Materials

None.

1094. Software

1. "Software" specially designed or modified for the "development" of equipment or "technology" controlled by 1091., 1092. or 1095.3.
2. "Software" specially designed or modified for the "production" of equipment controlled by 1091. or 1092.
3. "Software" specially designed or modified for the "use" of full authority digital electronic engine controls ("FADEC") for propulsion systems controlled by 1091. or equipment controlled by 1092., as follows:
   a. "Software" in digital electronic controls for propulsion systems, aerospace test facilities or air breathing aero-engine test facilities;
   b. Fault-tolerant "software" used in "FADEC" systems for propulsion systems and associated test facilities.
4. Other "software", as follows:
   a. 2D or 3D viscous "software" validated with wind tunnel or flight test data required for detailed engine flow modeling;
   b. "Software" for testing aero gas turbine engines, assemblies or components, specially designed to collect, reduce and analyze data in real time, and capable of feedback control, including the dynamic adjustment of test articles or test conditions, as the test is in progress;
   c. "Software" specially designed to control directional solidification or single crystal casting;
   d. "Software" in "source code", "object code" or machine code required for the "use" of active compensating systems for rotor blade tip clearance control.
      Note:
      1094.4.d. does not control "software" embedded in uncontrolled equipment or required for maintenance activities associated with the calibration or repair or updates to the active compensating clearance control system.

1095. Technology

1. "Technology" according to the General Technology Note for the "development" of equipment or "software" controlled by 1091.1.c., 1091.4. to 1091.11., 1092. or 1094.
2. "Technology" according to the General Technology Note for the "production" of equipment controlled by 1091.1.c., 1091.4. to 1091.11. or 1092.
   N.B.:
   For "technology" for the repair of controlled structures, laminates or materials, see 1015.2.f.
   Note.
   "Development" or "production" "technology" controlled by 1095. for gas turbine engines remains controlled when used as "use" "technology" for repair, rebuild and overhaul. Excluded from control are: technical data, drawings or documentation for maintenance activities directly associated with calibration, removal or replacement of damaged or unserviceable line replaceable units, including replacement of whole engines or engine modules.
3. Other "technology", as follows:
   a. "Technology" "required" for the "development" or "production" of any of the following gas turbine engine components or systems:
      1. Gas turbine blades, vanes or tip shrouds made from directionally solidified (DS) or single crystal (SC) alloys having (in the 001 Miller Index Direction) a stress-rupture life exceeding 400 hours at 1,273 K (1,000°C) at a stress of 200 MPa, based on the average property values;
      2. Multiple domed combustors operating at average burner outlet temperatures exceeding 1,813 K (1,540°C), or combustors incorporating thermally decoupled combustion liners, non-metallic liners or non-metallic shells;
      3. Components manufactured from any of the following:
         a. organic "composite" materials designed to operate above 588 K (315°C);
         b. metal "matrix" "composite", ceramic "matrix", intermetallic or intermetallic reinforced materials controlled by 1013.7; **or**
         c. "composite" material controlled by 1013.10. and manufactured with resins controlled by 1013.8.