

# Solar Turbines

*A Caterpillar Company*

## SPECIFICATION

### AUXILIARY SERVICE AIR

Data  
Control  
Level  
**1**

SPECIFICATION NO.

ES 2201

ISSUED: 7/6/98 ; PRD 65612-1

(Date and PRD No.)

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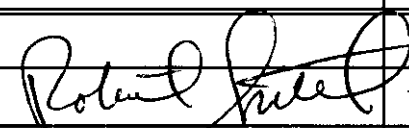
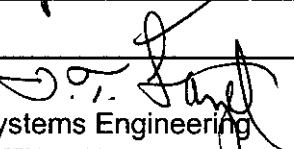
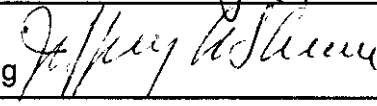
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## SIGNATURE PAGE

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## 1.0 REFERENCES

|                           |                                                                 |
|---------------------------|-----------------------------------------------------------------|
| ISO 8573-1                | International Standards Organization                            |
| CGA G7.1                  | Compressed Gas Association                                      |
| ISA S7.3                  | Instrument Society of America                                   |
| IES RP-CC-001.3           | Illuminating Engineering Society                                |
| OSHA 29CFR 1900-1910      | Occupational Safety and Health Administration                   |
| SAE ARP-1156              | Society of Automotive Engineers/Aerospace Recommended Practices |
| MIL Std 282               | Military Standards Organization                                 |
| Fed STD 209               | Federal Standard                                                |
| Parker Filtration Catalog | 1300-300                                                        |

### Solar Turbines

|         |                                                                              |
|---------|------------------------------------------------------------------------------|
| ES 1211 | General Specification for Fuel and Service Gas for Solar Gas Turbine Engines |
| ES 9-98 | Fuel, Air, and Water (or Steam) for Solar Gas Turbine Engines                |
| PIL 140 | Product Information Letter                                                   |

**2.0 PURPOSE** - The purpose of this specification is to establish the minimum air quality required for usage on Solar turbines packages in auxiliary applications.

**3.0 SCOPE** - This specification applies to all auxiliary air applications on Solar Turbine's engine packages, but not engine inlet air. Refer to Solar ES 9-98 for engine air requirements. Auxiliary air applications include, but are not limited to, buffer air, pilot air, sparging air, and air assist.

This specification will establish the maximum allowable moisture content, temperature, particle size, and oil content allowable to prevent plugging and wear of critical passages and components for the safe and satisfactory function of these systems.

## 4.0 DEFINITIONS

|                   |                                                                                                                                                               |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dew Point         | The temperature at a given pressure at which water vapor condenses (e.g., -40°F @ 200 psig).                                                                  |
| Micron ( $\mu$ )  | Physical dimension equal to a millionth of a meter (0.000001 m).                                                                                              |
| ppm               | Parts per million, given on either weight basis as ppm (w/w) or volume basis as ppm (v/v), is the relative amount of a contaminant to a million parts of air. |
| mg/m <sup>3</sup> | Milligrams per cubic meter, like ppm, used as a measure of contaminant concentration.                                                                         |

**5.0 REQUIREMENTS** - This specification provides the quality requirements for particle size, oil content, dew point, maximum temperature and contaminants. Refer to sections below for specific requirements.

**5.1 PARTICLE SIZE** - The particle size in the air stream at Solar's customer connection point shall not exceed  $10\mu$ . As it is impractical to achieve 100% removal of all particles of  $10\mu$  and larger, this shall be defined as  $\beta_{10} > 100$ , or 99% efficient. The concentration of particulates  $10\mu$  and smaller shall be less than 5 ppm (w/w)

**5.2 OIL CONTENT** - The oil or hydrocarbon content shall not exceed one (1) ppm (w/w).

**5.3 DEW POINT** - For indoor or outdoor installations, the dew point at line pressure shall be at least  $10^{\circ}\text{F}$  below the minimum temperature to which any part of the air system is exposed, at any season of the year.

**5.4 TEMPERATURE LIMITS** - The lower temperature is primarily controlled by dew point requirements. However, the minimum for system design purposes is  $-20^{\circ}\text{F}$ . The maximum temperature limit is  $200^{\circ}\text{F}$ .

**5.5 CONTAMINANTS** - The auxiliary service air shall be free of all corrosive contaminants and hazardous gases, flammable or toxic, which may be drawn into the air stream.

**6.0 STANDARDS** - An ISO 8573-1 Quality Class 3.2.3 meets this specification for most ambient conditions. This is a Class 3 particle requirement ( $5\mu$ ,  $5\text{ mg/m}^3$ ), Class 2 dewpoint ( $-40^{\circ}\text{F}$ ) and Class 3 oil content ( $1\text{ mg/m}^3$ ). ISA S7.3, Instrument Quality Air, exceeds this requirement.