CATERPILLAR®

# GENERATOR SELECTION – SMALL GENSETS (HARSH ELECTRICAL AND PHYSICAL ENVIRONMENTS)

October 2008

## PRODUCT UPDATE

Caterpillar offers many types of ratings, including standby, prime, and continuous rated generator sets. The ratings definitions are a function of the number of operating hours per year and the average load factor of the generator set. Generator sets with any of these ratings may be installed into applications where they will experience harsh environments, either physical or electrical. Physical harsh environments are defined as environments that contain any of the following: condensing humidity, abrasive airborne material (i.e. sand, salt, or dust), or corrosive airborne material (i.e. salt or chemicals). Electrical harsh environments include, but are not limited to: non-linear loads, high inrush loading, and repetitive cycling of loads. Although not covered in this document, other environmental and application factors exist that should be considered when selecting a generator, and include: ambient temperature, voltage level, and transient response.

Generators used in prime and continuous applications and/or harsh environments (both physical and electrical) should be constructed with a greater degree of durability than generators that are used in standby and/or optimum electrical and physical environments. To address this need for greater durability, Caterpillar offers premium generator options with coastal insulation protection (CIP). Additional options are available, such as space heaters, which should be considered when determining the correct generator for a specific application. In some installations, the physical or electrical environment will dictate the generator construction and/or generator options to ensure maximum generator durability.

Small Cat® generators are available with random wound main stator construction in low voltage (up to 600 volts) generators as the standard configuration. An additional level of insulation is available for random wound generators by adding costal insulation protection (CIP) to the generator during the construction process. The durability and endurance of the random wound stator windings with CIP is superior to the random wound windings alone; however, because of the additional manufacturing process, CIP is generally more expensive. Caterpillar recommends that the dealer, consulting engineer, and customer carefully review all load and application factors and select the most suitable generator winding type and appropriate options for each application. The following table is a summary of some physical environments a small generator can be installed in, and the recommended options to include for increased generator life. Refer to the “Electric Power Applications, Engine, & Generator Sizing” A&I guide for more information.

| | | Physical Environment | | | |
|---|---|---|---|---|---|
| | | Condensing Humidity | Abrasive | Corrosive | High Ambient (>40°C) |
| Application | Standby | Space Heater | Coastal Insulation Protection | Coastal Insulation Protection | Oversize Generator |
| | Prime Continuous | Space Heater | Coastal Insulation Protection | Coastal Insulation Protection | Oversize Generator |

## ABOUT

About Caterpillar
For more than 80 years, Caterpillar Inc. has been making progress possible and driving positive and sustainable change on every continent. With 2011 sales and revenues of $60.1 billion, Caterpillar is a technology leader and the world's leading manufacturer of construction and mining equipment, clean diesel and natural gas engines and industrial gas turbines.

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