NAME

glMaterialf, glMateriali, glMaterialfv, glMaterialiv – specify material parameters for the lighting model

C SPECIFICATION

void **glMaterialf**(GLenum *face*,
GLenum *pname*,
GLfloat *param*)
void **glMateriali**(GLenum *face*,
GLenum *pname*,
GLint *param*)

PARAMETERS

face Specifies which face or faces are being updated. Must be one of **GL_FRONT**, **GL_BACK**, or **GL_FRONT_AND_BACK**.

pname Specifies the single-valued material parameter of the face or faces that is being updated. Must be **GL_SHININESS**.

param Specifies the value that parameter **GL_SHININESS** will be set to.

C SPECIFICATION

void **glMaterialfv**(GLenum *face*,
GLenum *pname*,
const GLfloat **params*)
void **glMaterialiv**(GLenum *face*,
GLenum *pname*,
const GLint **params*)

PARAMETERS

face Specifies which face or faces are being updated. Must be one of **GL_FRONT**, **GL_BACK**, or **GL_FRONT_AND_BACK**.

pname Specifies the material parameter of the face or faces that is being updated. Must be one of **GL_AMBIENT**, **GL_DIFFUSE**, **GL_SPECULAR**, **GL_EMISSION**, **GL_SHININESS**, **GL_AMBIENT_AND_DIFFUSE**, or **GL_COLOR_INDEXES**.

params Specifies a pointer to the value or values that *pname* will be set to.

DESCRIPTION

glMaterial assigns values to material parameters. There are two matched sets of material parameters. One, the *front-facing* set, is used to shade points, lines, bitmaps, and all polygons (when two-sided lighting is disabled), or just front-facing polygons (when two-sided lighting is enabled). The other set, *back-facing*, is used to shade back-facing polygons only when two-sided lighting is enabled. Refer to the **glLightModel** reference page for details concerning one- and two-sided lighting calculations.

glMaterial takes three arguments. The first, *face*, specifies whether the **GL_FRONT** materials, the **GL_BACK** materials, or both **GL_FRONT_AND_BACK** materials will be modified. The second, *pname*, specifies which of several parameters in one or both sets will be modified. The third, *params*, specifies what value or values will be assigned to the specified parameter.

Material parameters are used in the lighting equation that is optionally applied to each vertex. The equation is discussed in the **glLightModel** reference page. The parameters that can be specified using **glMaterial**, and their interpretations by the lighting equation, are as follows:

GL_AMBIENT *params* contains four integer or floating-point values that specify the ambient RGBA reflectance of the material. Integer values are mapped linearly such that the most positive representable value maps to 1.0, and the most negative

representable value maps to −1.0. Floating-point values are mapped directly. Neither integer nor floating-point values are clamped. The initial ambient reflectance for both front- and back-facing materials is (0.2, 0.2, 0.2, 1.0).

GL_DIFFUSE *params* contains four integer or floating-point values that specify the diffuse RGBA reflectance of the material. Integer values are mapped linearly such that the most positive representable value maps to 1.0, and the most negative representable value maps to −1.0. Floating-point values are mapped directly. Neither integer nor floating-point values are clamped. The initial diffuse reflectance for both front- and back-facing materials is (0.8, 0.8, 0.8, 1.0).

GL_SPECULAR *params* contains four integer or floating-point values that specify the specular RGBA reflectance of the material. Integer values are mapped linearly such that the most positive representable value maps to 1.0, and the most negative representable value maps to −1.0. Floating-point values are mapped directly. Neither integer nor floating-point values are clamped. The initial specular reflectance for both front- and back-facing materials is (0, 0, 0, 1).

GL_EMISSION *params* contains four integer or floating-point values that specify the RGBA emitted light intensity of the material. Integer values are mapped linearly such that the most positive representable value maps to 1.0, and the most negative representable value maps to −1.0. Floating-point values are mapped directly. Neither integer nor floating-point values are clamped. The initial emission intensity for both front- and back-facing materials is (0, 0, 0, 1).

GL_SHININESS *params* is a single integer or floating-point value that specifies the RGBA specular exponent of the material. Integer and floating-point values are mapped directly. Only values in the range [0,128] are accepted. The initial specular exponent for both front- and back-facing materials is 0.

GL_AMBIENT_AND_DIFFUSE
Equivalent to calling **glMaterial** twice with the same parameter values, once with **GL_AMBIENT** and once with **GL_DIFFUSE**.

GL_COLOR_INDEXES
params contains three integer or floating-point values specifying the color indices for ambient, diffuse, and specular lighting. These three values, and **GL_SHININESS**, are the only material values used by the color index mode lighting equation. Refer to the **glLightModel** reference page for a discussion of color index lighting.

NOTES

The material parameters can be updated at any time. In particular, **glMaterial** can be called between a call to **glBegin** and the corresponding call to **glEnd**. If only a single material parameter is to be changed per vertex, however, **glColorMaterial** is preferred over **glMaterial** (see **glColorMaterial**).

ERRORS

GL_INVALID_ENUM is generated if either *face* or *pname* is not an accepted value.

GL_INVALID_VALUE is generated if a specular exponent outside the range [0,128] is specified.

ASSOCIATED GETS

glGetMaterial

SEE ALSO

glColorMaterial, **glLight**, **glLightModel**