

Section 2.1 C++11

constexpr Functions

```

assert(x < 100);           // Error, no runtime asserts
int y = x;                // Error, no local variables
if (x > 5) { return x; }  // Error, no if statements
using S = struct { };    // Error, no aliases that define types
return x += 3;           // Error, no compound assignment
}

```

The good news is that the aforementioned restrictions on the kinds of constructs that are permitted in **constexpr** function bodies are significantly relaxed as of C++14; see Section 2.2. “**constexpr** Functions ’14” on page 959.

Irrespective of the *kinds* of constructs that are allowed to appear in a **constexpr** function body, ~~every invocation of a function, a constructor, or an implicit conversion operator in the return statement must itself be usable in at least one constant expression~~, which means the corresponding function *must*, at a minimum, be declared **constexpr**:

```

int ga() { return 0; } // nonconstexpr function returning 0
constexpr int gb() { return 0; } // constexpr function returning 0

struct S1a {          S1a() { } }; // nonconstexpr default constructor
struct S1b { constexpr S1b() { } }; // constexpr default constructor

struct S2a { operator int() { return 5; } }; // nonconstexpr conversion
struct S2b { constexpr operator int() { return 5; } }; // constexpr conversion

constexpr int f1a() { return ga(); } // Error, ga is not constexpr.
constexpr int f1b() { return gb(); } // OK, gb is constexpr.

constexpr int f2a() { return S1a(), 5; } // Error, S1a ctor is not constexpr.
constexpr int f2b() { return S1b(), 5; } // OK, S1b ctor is constexpr.

constexpr int f3a() { return S2a(); } // Error, S2a conversion is not constexpr.
constexpr int f3b() { return S2b(); } // OK, S2b conversion is constexpr.

```

~~Note that nonconstexpr implicit conversions, as illustrated by f3a above, can also result from a nonconstexpr, nonexplicit constructor that accepts a single argument.~~

Constraints specific to constructors

In addition to the general restrictions on a **constexpr** function’s body (see *Restrictions on constexpr function bodies (C++11 only)* on page 268) and its allowed parameter and return types (see *constexpr-function parameter and return types* on page 277), several additional requirements are specific to constructors.

1. The body of a **constexpr** constructor is restricted in the same way as any other **constexpr** function, except that the **return** statement is disallowed. Hence, the body of a **constexpr** constructor must be essentially empty with few exceptions: