

constexpr Functions

Chapter 2 Conditionally Safe Features

```

namespace n          // enclosing namespace
{
    class C { /*...*/ }; // arbitrary class definition

    struct S
    {
        constexpr S(bool) try { } catch (...) { } // Error, function try block
        S(char) try { } catch (...) { } // OK, not declared constexpr

        constexpr S(int)
        {
            ; // OK, null statement
            static_assert(1, ""); // OK, static_assert declaration
            typedef int Int; // OK, simple typedef alias
            using Int = int; // OK, simple using alias
            typedef enum { } E; // Error, typedef used to define enum E
            using n::C; // OK, using declaration
            using namespace n; // OK, using directive
        }
    };
} // close namespace

```

2. All **nonstatic data members** and base-class subobjects of a class must be initialized by a **constexpr** constructor,⁴ and the initializers themselves must be usable in a **constant expression**. Scalar members must be explicitly initialized in the **member-initializer list** or via a **default member initializer**, i.e., they cannot be left in an uninitialized state:

```

struct B // constexpr constructible only from argument convertible to int
{
    B() { }
    constexpr B(int) { } // constexpr constructor taking an int
};

struct C // constexpr default constructible
{
    constexpr C() { } // constexpr default constructor
};

struct D1 : B // public derivation
{

```

⁴The requirement that all members and base classes be initialized by a constructor that is explicitly declared **constexpr** is relaxed in C++20 provided that uninitialized **entities** are not accessed at compile time.