CUMING CORPORATION

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TECHNICAL NOTE 100-9

HANDLING, INSTALLATION, MAINTENANCE, AND REPAIR OF C-FLOAT BUOYANCY MODULES

GENERAL

The following instructions are general in nature, and may not apply in every case. The user should consult both the riser manufacturer and Cuming Corporation to ensure that all procedures are correct. The sketch (right) identifies the parts of a typical buoyancy module installation.

MATERIALS

C-FLOAT syntactic foam buoyancy modules are made of epoxy plastic resin, tiny glass microspheres, fiberglass macrospheres, and fiberglass fabric. The fiberglass fabric forms a tough outer skin that resists damage. However, it must be remembered that plastic is not as strong as steel, so caution is required in handling these units.

HANDLING PRECAUTIONS

The principal handling precaution is to avoid impact against sharp metal edges which may cut or break the foam plastic. Severe impact is the most common cause of damage to buoyancy modules. Use nylon or similar soft straps to lift and move modules. Chains or wire rope slings will cut and scratch the module surface.

STACKING AND RACKING

The fiberglass skin of C-FLOAT buoyancy modules can support bearing loads up to 1,000 psi, normally allowing modules to be stacked up to ten (10) layers high without damage. Fully suited riser joints can be stacked up three (3) layers high. Racks should be designed to provide clearance on either side of at least 0.50" larger than the maximum module diameter. Each shored module should be supported at two points, roughly corresponding to the locations of the flexure lugs, so as to avoid bending loads. Shoring beams should be no less than 4.00" wide.

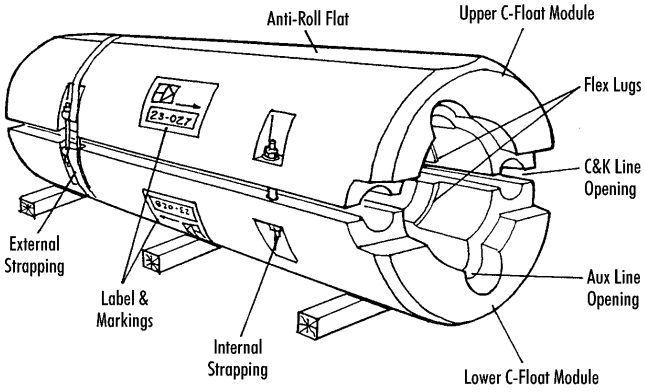
TOOLS REQUIRED

A mobile crane will be required with capacity to lift a completed user joint with modules, along with sufficient straps or slings. A forklift truck is a convenient way to move individual modules. The basic hand tools required are wrenches and/or deep sockets to fit the module nuts. Pneumatic wrenches will greatly speed installation. A torque wrench for checking nut torque (see “Torque on Nuts”) is also recommended.

TORQUE ON NUTS

Another common cause of damage to modules is over-tightening of nuts and locknuts. Excessive torque will stretch or break straps and may damage the fiberglass skin of the modules. Most C-FLOAT modules require only twenty (20) foot-lbs. of torque for safe, secure assembly. Check specific instructions for torque, and avoid exceeding the specified limit.

TYPICAL C-FLOAT BUOYANCY MODULE INSTALLATION



SUGGESTED ASSEMBLY PROCEDURE

1. Lay out the bottom tier of modules for one joint, concave side up, resting on level shoring. Modules should be properly aligned and oriented, with ends touching
2. Lower the riser joint onto the lower tier of modules. The joint should rest snugly, contacting only the module flexure lugs, with no binding or interference.
3. Place the upper tier of modules in place, concave side down, and check their fit on the riser. Take care to align bolting of upper and lower pairs of modules.
4. Install thrust collars at both ends of the joint and adjust for tight fit against the ends of the modules.
5. Install straps and/or bolting on modules and carefully torque nuts per instructions (see “Torque on Nuts”). Apply locknuts as required. Record serial numbers of modules on joint for future reference. Periodically re-check torque to ensure tightness.

MAINTENANCE

C-FLOAT syntactic foam buoyancy modules require very little maintenance. All fasteners should be checked periodically for tightness and proper torque. Damaged straps or corroded fasteners should be replaced promptly. Markings should be refreshed when obscured. Modules with scratches or minor surface damage do not necessarily require repair, as explained in “Inspection” paragraph.

INSPECTION

Periodic inspections should be part of any preventive maintenance program. When inspecting buoyancy modules for possible repair, it will be helpful to divide them into three categories:

1. Modules with little damage, including scratches and minor surface abrasions, do not necessarily require repair, unless small amounts of patch and touch-up paint are desirable for cosmetic reasons. This work can be easily performed in the field.
2. Modules with moderate damage, such as cracks, chips, or broken sections, should be repaired promptly to prevent further deterioration. This work can also be performed in the field, but should be supervised by a trained professional.
3. Modules with severe damage, including those broken into two or more pieces, can often be repaired, although the economic feasibility of such repair may be doubtful. Badly damaged modules must be sent to a factory-authorized repair facility.

REWORK AND REPAIR

It is possible to rework modules by cutting or grinding to a new shape. Reworked modules will require patching and painting. The following outlines a general repair procedure:

1. Sand or grind until sound underlying material is reached. Clean the area so it is dry and dust-free.
2. Mix the contents of the repair kit per instructions (see "Repair Kits and Spare Parts Available"). Work area must be clean, dry, and warm.
3. Apply patch mixture to the damaged area with a trowel or putty knife. Carefully work patch into voids or cracks.
4. If a broken piece is to be re-attached, press it into place and hold with duct tape. Allow patch to cure 24 hours.
5. After patch is fully hardened, sand or grind to finished shape. Fiberglass may be applied to outer surfaces, if desired. Paint with materials supplied with kit or with any good two-part epoxy marine paint.

REPAIR KITS AND SPARE PARTS AVAILABLE

Cuming Corporation provides kits of repair materials for C-FLOAT modules. Two standard kits are now available, and can be ordered directly from the factory:

- C-FLOAT KIT NO. 1 (Technical Bulletin 127-1) is for the repair of minor surface damage. The kit consists of light patch materials, paint, assorted spatulas and mixing sticks, and complete instructions. Each kit is sufficient for the cosmetic repair of approx. five to ten modules.
- C-FLOAT KIT NO. 2 (Technical Bulletin 127-2) is intended for repair of more seriously damaged modules. The kit consists of two-part epoxy adhesive, heavy-duty patch material and fiberglass reinforcement, along with tools and complete instructions. Each kit is normally sufficient for the repair of one or two modules, depending on the extent of damage.
- SPARE PARTS: In addition to repair materials, Cuming Corporation can supply a variety of spare and replacement parts and accessories to fit most buoyant riser, including straps in stainless steel or Kevlar, strap tensioners, thrust collars and bolting. Contact our sales offices for advice on what parts are available.

C-FLOAT REPAIR FACILITIES

In cooperation with Stewart & Stevenson, Cuming Corporation provides storage, installation, and repair services in both Louisiana and Texas. These well-equipped facilities provide our customers with conveniently-located sites for the factory-authorized repair of C-FLOAT riser buoyancy modules. To find out more about these services, contact our USA sales offices:

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