



Environmental Technology Verification (ETV) Program - Technology Fact Sheet

LEVEL-CUT™ Clamshell Bucket CABLE ARM (CANADA) INC.

Performance Claim

The Cable-Arm *LEVEL-CUT™ Clamshell Bucket*, when dredging underwater sediment and when operated in accordance with the manufacturer's instructions, can:

1. on each single closure of the bucket, achieve a cut-face with a maximum of +20 cm or -20 cm (8 inches) deviation from a perfectly smooth, level plane 95% of the time; and,
2. produce a sediment-surface profile with an average depth which has a maximum deviation of +20 cm or -20 cm (8 inches) from the specified depth for the project 95% of the time.

Technology Description

While regular buckets produce a "scoop" profile, the LEVEL-CUT™ bucket's "floating pivot" action produces a cut face which is very close to "level". Regular bucket-type dredges are opened by counterweights and closed with cables. The Cable Arm LEVEL-CUT™ bucket is closed with cables but swings open under its own weight. Without counterweights a heavier payload can be carried. The Cable Arm bucket also has patented overlapping side plates and special venting to minimize turbidity in the work area.

Technology Application

The Cable Arm LEVEL-CUT™ Clamshell bucket is used for dredging sediment from navigational channels and contaminated waterways and for loading and unloading granular products from bulk carriers. In the environmental field, the significant application is the removal of contaminated sediment from waterways and harbours. The LEVEL-CUT™ bucket, if operated to the manufacturer's specifications, can more precisely remove the sediment layers which are contaminated, while the removal of non-contaminated material is minimized, thus reducing disposal costs. At the same time, the LEVEL-CUT™ bucket sideplates and vents minimize re-suspension of sediment during dredging which means that less contaminated sediment escapes from the dredge zone. Moreover, the elimination of counterweights means that the Cable Arm design can carry a heavier load per cycle than other buckets. Fewer cuts means less resuspension and less turbidity.

Performance Conditions

The claimed performance of Cable Arm's Level-Cut™ bucket is achievable when the bucket is operated in accordance with the manufacturer's instructions. Specifically:

1. the crane and support system (usually a barge) must be strong enough and have the appropriate mechanical systems to operate the bucket;
2. the operator must use Cable Arm's three-dimensional positioning system in order to achieve the claimed precision;

and

3. the operator must have appropriate training and experience with the crane and Cable Arm Level-Cut™ bucket.

Verification

Testing for the level-cut claim was conducted at the Dean Construction Ltd. facility in La Salle, Ontario on May 22, 1998. The precision of the dredge bucket in dredging to specified depths was tested in an actual field situation in Thunder Bay harbour, Ontario in 1997. The data used in the verification were collected by Public Works and Government Services Canada. The verification of the performance claim was carried out by Water Technology International Corporation of Burlington, Ontario.

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