



# **GUIDANCE FOR MECHANISED GROUT BAG HANDLING**

## Project - Vacuum Lifter



## Contents

1.0 Aim: .....	4
1.1 Concept Ideas: .....	4
1.2 Initial Trials:.....	4
1.3 Specifications: .....	6
1.4 Outcome of initial trials .....	7

## 1.0 Aim:

A working group has been assembled to look at ways in which the amount of manual handling operations can be reduced during the process of handling and mixing with 25Kg dry powder bags. The aims for the working group are:

- To arrive at a best practice document that does not involve significant elements of manual handling during grout production.
- The final solution needs to cater for hired mixers given BSL do not directly own any of their own.
- Reduce the footprint of the final set up to an absolute minimum.
- Operation to be designed to reduce twisting action by operator.
- Dust suppression to be assessed and reduced if deemed necessary.

## 1.1 Concept Ideas:

Ideas were discussed during a skype meeting on 4<sup>th</sup> August 2020. It was concluded that the below listed options were the most practical:

- 1) Mixer to be fed by conveyor belt assisted by vacuum and pallet lifters.
- 2) Mixer platform to be developed which would include the vacuum and pallet lifters.
- 3) A small 10ft container to be developed to enclose a mixer, the vacuum and pallet lifters.

## 1.2 Initial Trials:

Given all three concept ideas include the use of the vacuum and pallets lifters, it was decided to trial the current vacuum lifting equipment available in the market with suitable modifications.

The pallet lifters had been previously trailed by Keller site teams and were proven to be very successful. Keller have invested in 4 pallet lifters to date.

Bachy have since cross hired two pallet lifters from Keller and concur that the pallet lifters should be utilised in of the concept ideas referenced in section 1.1.



Initial Vacuum lifter trials were carried out at one of Bachy's work sites. The ALVAC Two-Joint Arm lifter was used for a 2-week demonstration period on a grouting work site where multiple types of Cementitious products were being used for grout production using a colloidal 410 mixer.

The vacuum lifter trialled is shown below.



### 1.3 Specifications:

#### Floor-mounted unit technical specifications

Lifting capacity (Safe Work Load):	50 kg
Range:	2500 mm
Lifting height, floor mounted:	1750 mm
Lifting height, mounted on counterweight:	1930 mm
Work area:	360°
Total height, floor mounted:	3100 mm
Total height, mounted on counterweight:	3280 mm
Vacuum pump:	- 0,45 bar 5.0 A, 3 x 400 V/50 Hz
Column with 600 x 600 mm floor console	
Lifting hose:	Ø 140 mm
Suction head:	rotates 360°
SWL higher than 50 kg available. Please contact AL-Vac	

<http://www.al-vac.co.uk/Industry/twojointswingarm.html>

## 1.4 Outcome of initial trials

First impressions when operating the vacuum lifter were positive, it picks up the cement and sand bags with ease and glides the bags easily into preferred positions.

1. Piston inside suction pad keeps sticking due to cement dust, tried WD40 which helps for a very short period before gathering again around piston making it even more difficult second time around as the oil turns to a grinding paste.
2. It can be a struggle at times to manoeuvre the suction pad around because of the mechanical movement of the double sectioned arm that holds the hose and suction pad.
3. We trialled lifting a wet cement bag, it works on the first lift, on a second attempt the paper on the bag tore, see attached picture.
4. Using the vacuum lift is slower than manual handling bags, which as agreed is fine.
5. Awareness and Repetitiveness of using the Vacuum lifter, we discussed The mindset and Auto Pilot mode of the Operator, suggestions were to put a switch in place where the operator must stop and reset a push button after lifting his mix quantity, allowing the operator to break the chain of Auto pilot.

As agreed there is definitely potential for using the Vacuum Lifter with some Modifications made.