



TAKEDA, GRANGE CASTLE, DUBLIN

CASE STUDY

Optimizing Process Loads for VHP Decontamination - Takeda P3

Commissioning, Qualification, and Validation





Overview

After recently delivering a successful project in Regeneron and given our strong historical relationship with Takeda, CAI was selected to support Takeda GC in reviving and delivering a failing CQV project. The challenge for Takeda was the inefficient Vapourised Hydrogen Peroxide Material Air Lock (VHP MAL) loads that were currently in use.

Takeda and CAI have a long-standing relationship; CAI supports Takeda at many key sites globally (Lexington, Brooklyn Park, Thousand Oaks, Osaka etc.) in commissioning, qualification, quality systems, and Operational Readiness.

Project Overview

Takeda Grange Castle constructed a new Advanced Therapy Medicinal Product (ATMP) manufacturing facility (P3) on the Takeda GC site dedicated to the manufacture of Alofisel to supply the EU, Canada, and US markets. The P3 facility is a modular constructed facility with 6 production suites. Each production suite contains a MAL equipped with a VHP system for the decontamination and subsequent transfer of production materials from a Grade D area to the Grade B production suite.

Materials are placed on trolleys using a validated load configuration in the VHP MAL chamber and are then exposed to VHP for a set time for decontamination. The project objective was to develop more optimal VHP Loads to improve operational efficiency supporting the Alofisel production process.



CLIENT:

Takeda

LOCATION:

Dublin, Ireland

TIME FRAME:

4 Years

CONTRACT SIZE:

€50 million



Client Challenges

The project team faced several challenges which directly impacted the success of the project.

The initial VHP MAL loads and their configuration were outdated, not process specific, and no longer optimal for the production process. This led to bottlenecks/inefficiencies during Alofisel production not to mention the significant business cost incurred. CAI were tasked with designing 'optimized' loads and configurations that would alleviate any production inefficiencies.

CAI Challenges	CAI Solutions
<p>Lack of Process Knowledge</p> <ul style="list-style-type: none"> Lack of process knowledge during initial load development led to sub-optimal loads being qualified 	<ul style="list-style-type: none"> CAI team familiarized themselves with the Alofisel production process Identify production 'pinch-points' (i.e., items missing or below required quantity level) Identify critical items essential to the process Identify 'non-critical' items not essential to the process
<p>Communication/Lack of Key Stakeholder Involvement:</p> <ul style="list-style-type: none"> Difficult to get key stakeholder involvement/input (affected by Covid/Remote working) during initial load development. Limited operations and QC micro input due to conflicting priorities 	<ul style="list-style-type: none"> Early and constant engagement with all key stakeholders to drive better coordination and a right-first-time scenario for the new loads. Obtain Bill of Materials and process flow documents for a greater understanding of load requirements 2 x 3hr workshops were scheduled with all stakeholders (Operations, QC Micro, cleaning, and Manufacturing science) to determine each departments load item requirements
<p>Load Configuration:</p> <ul style="list-style-type: none"> Designing loads that included all items and satisfied all production requirements whilst allowing for successful decontamination was a major challenge Previous loads were too reliant on basket trays to hold materials resulting in reduced airflow/gas circulation and an increased amount of occluded surfaces that avoided VHP exposure 	<ul style="list-style-type: none"> To utilize all trolley space and allow for successful decontamination, bespoke shelves were designed with a basket tray and rails underneath to hang items Suitable items were hung using these shelving rails with clips where possible. Hanging items on MAL load trollies allowed for better VHP circulation and a reduction in occluded surfaces during a VHP cycle Cycle development was carried out to test VHP cycle's 'edge of failure' parameters before cycle 'buffer margins' were added 5 VHP MAL loads were successful configured, cycle developed and qualified on 3 different VHP MALs that feed into 3 different production suites



Project Success

The project was delivered on-time with the successful qualification of 5 VHP MAL loads (4 production loads and 1 cleaning load) on 3 different VHP MALs that supplement 3 different production suites. The development of these loads significantly reduced Alofisel production bottlenecks allowing Takeda to produce batches of Alofisel with far greater efficiency, greater sterility assurance, and a lower financial cost.

Takeda recognized this and have since awarded CAI additional scope outlined below:

- Qualification of 2 additional VHP MALs that supplement Production Rooms 5 and 6
- Drive VHP Production Isolator load design and configuration, cycle development and final qualification in the P3 expansion project.

Takeda GC P3 facility was Ireland's first ATMP facility and thus was a unique project with which CAI played a key role in delivering. As a result of this success, CAI has gained additional scope and expanded their service offerings in Takeda GC. CAI has become a trusted service provider for Takeda GC.

“The successes we have experienced in Cell Therapy P3 Grange Castle are a reflection of the dedication and commitment from the CAI team members, the CAI team has led by example and fundamentally displayed the knowledge and skill set required to support Takeda P3 Operations and HPRA readiness”

– Bertie Daly, Manufacturing Head, Cell Therapy Takeda P3.