



WHITEPAPER

AN INTRODUCTION TO ALLERGENS

Product Integrity and Allergen Best Practice

Following Matcon's Allergen Handling Open Days, which included guidance from industry experts, we have documented advice and best practice to help you improve the control of allergens in your processing plant whilst keeping production costs to a minimum.



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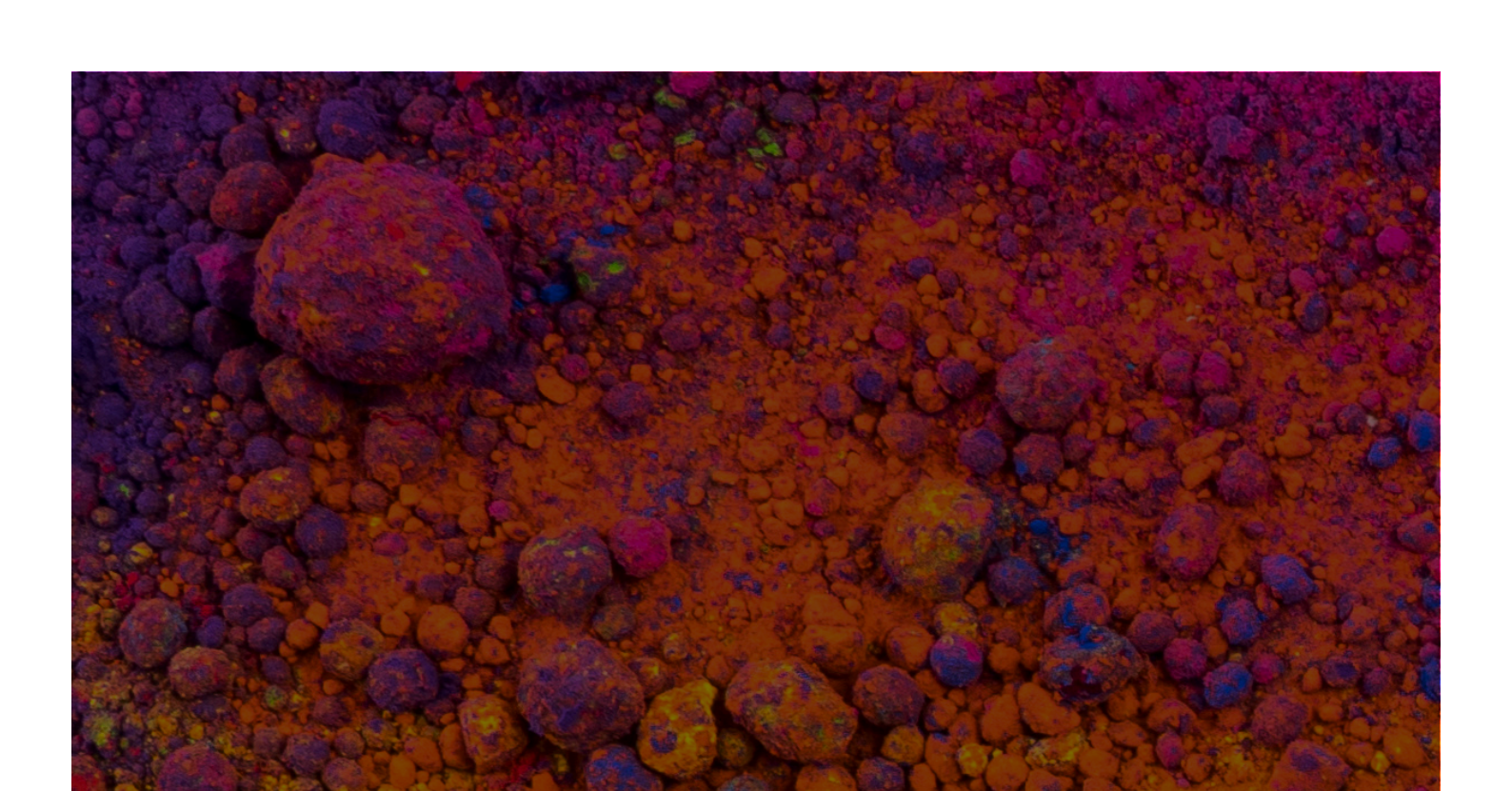
Recommendations for Manufacturers on Allergen Compliance

To help you think differently about allergens, we have prepared the following whitepaper. This is not designed to be the definitive guide to allergen control nor should its advice be taken as a step towards compliance, it is designed to provoke discussion.

We've collated advice and guidance from a variety of sources to cover the following:

- 1 An introduction to Allergens
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- 3 Future proofing your factory to handle allergens
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We hope this will help you on your way towards better handling of allergens.



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of ingredients has never been more
important.



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AN INTRODUCTION TO ALLERGENS, PRODUCT INTEGRITY AND HANDLING BEST PRACTICE

Is Your Production Line Set-up to Manage the Risks Presented by Allergens?

Expanding product portfolios, changes to legislation and new product growth opportunities means your manufacturing facility must be equipped to handle potentially hazardous ingredients.

With an increase in allergen awareness, consumer demand has pushed the responsibilities on to manufacturers. Failure to effectively manage allergens in the production process not only impacts reputation and profitability, it ultimately leaves you open to prosecution.

Key areas of potential risk:

- moving ingredients
- storage of ingredients
- mislabelled ingredients
- airborne powdered ingredients (dust)
- human error tipping the wrong ingredient
- insufficient cleaning
- difficult to clean equipment

Prevention is always better than cure but how can you allergen proof your facility?

The processes that control the handling of ingredients containing allergens has never been more important. The design of your facility has to take account of the need for the right space to store, move and process allergen containing materials.



Changes in Consumer Buying Habits

In the food, nutrition and wellness markets there is a huge shift in consumer buying habits that has led to a significant growth of lactose, vegan and gluten-free products being produced.

There is a huge growth opportunity for those manufacturers who can be first to the market but that requires equipment that is agile enough to meet these changes in consumer demand.

As these markets receive further attention, the accepted tolerance levels of certain ingredients are also changing, leading to manufacturers having to pay close attention to their processing methods. There is now a requirement for all food manufacturers to be clear and aware of exactly what is in their products and how they store, handle and process food that contains allergens.

What Happens if Things Do Go Wrong?

Hopefully you've never had to deal with an allergen related issue. But if it were to happen, this is what you could face:

If allergens are found during product testing, the product will have to be destroyed and manufacturing halted while a full clean-down of all equipment and the factory is carried out. While this takes place, orders will be left unfulfilled, deliveries will be missed, client relationships will be put at risk, and cashflow will be impacted.

Worse still, if it reaches the market place and a consumer reports a contamination issue to their local authority, manufacturing has to be stopped until you are given the all-clear from the authorities. This means a potential closure of weeks not days. Recalled products cause serious reputational damage to a brand as well as regulatory penalties.

Can you improve your allergen testing processes?

Allergen intolerance has dramatically increased in recent years and is no longer a niche issue. For food manufacturers and processors, allergen management should be an integral part of your daily process.

All manufacturers of products consumed by people, are expected to adhere to the Food Standard Agency's regulations. But there is now an additional need to be very specific about exactly what is in your products, how and where you store your products and how you handle and process goods that contain allergens.

Key Stats:

Allergen-free is less about the products themselves and more about labelling, transparency and education. 'Gluten-free' is perceived as the main 'Allergen-free' sector.

- 25% of UK households have a minimum of one allergy or intolerance sufferer
- Hospitals have seen a 615% increase in admissions for anaphylaxis
- 48% of people with an allergy or intolerance suffer more than one.

Food Scientist Pauline Titchener has worked for 12 years at Neogen, a global food safety corporation that develops and manufactures a variety of products dedicated to the testing and safety of food production and hygiene. One of their specialisms is in food allergens.

Pauline explains that successful methods for managing allergens include:

- Good Manufacturing Practices (GMP)
- Hazard Analysis and Critical Control Points (HACCP)
- Sanitation Standard Operating Procedures (SSOP)
- Validation and Verification of controls
- Clear labelling
- Robust manufacturing processes
- Allergen risk assessments
- Training employees

Allergens – An Opportunity Not Just a Problem - The current market for allergen-free products in the UK is worth approx. £27.5m (Euromonitor). Which means that while compliance is essential to eliminate risk, there is a profitable upside.



Allergens present an opportunity to widen product portfolios and enter new markets, not just create more problems.





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Can you improve your allergen testing processes?

As a starting point, you need to discover whether an allergen is currently present and how much is likely to remain after processing.

There are various ways to manually test for allergens, depending on your ingredients, at which stage of production you are testing and at what time. International food safety specialist, Neogen, provide ELISA assays for specific allergens in both microwell and lateral flow formats. For companies looking for external testing, they can provide contract laboratory services for food allergens.

There is no 'one size fits all' test, but guidance for specific allergens can be found in the table.

ALLERGEN	TEST METHODS			SERVICE
	Hand-held test	ELISA	DNA	External Lab
Celery			✓	
Crustacea / Shellfish	✓	✓	✓	✓
Egg	✓	✓		✓
Fish	✓	✓	✓	✓
Gluten	✓	✓	✓	✓
Lupin	✓	✓	✓	✓
Milk	✓	✓		✓
Mustard	✓	✓	✓	✓
Peanuts	✓	✓	✓	✓
Sesame	✓	✓	✓	✓
Soya	✓	✓	✓	✓
Sulphites				✓
	Tree Nuts			
- Almond	✓	✓	✓	✓
- Hazelnut	✓	✓	✓	✓
- Walnut	✓	✓	✓	✓
- Others	✓	✓	✓	✓

Can you improve your allergen testing processes (Cont.)

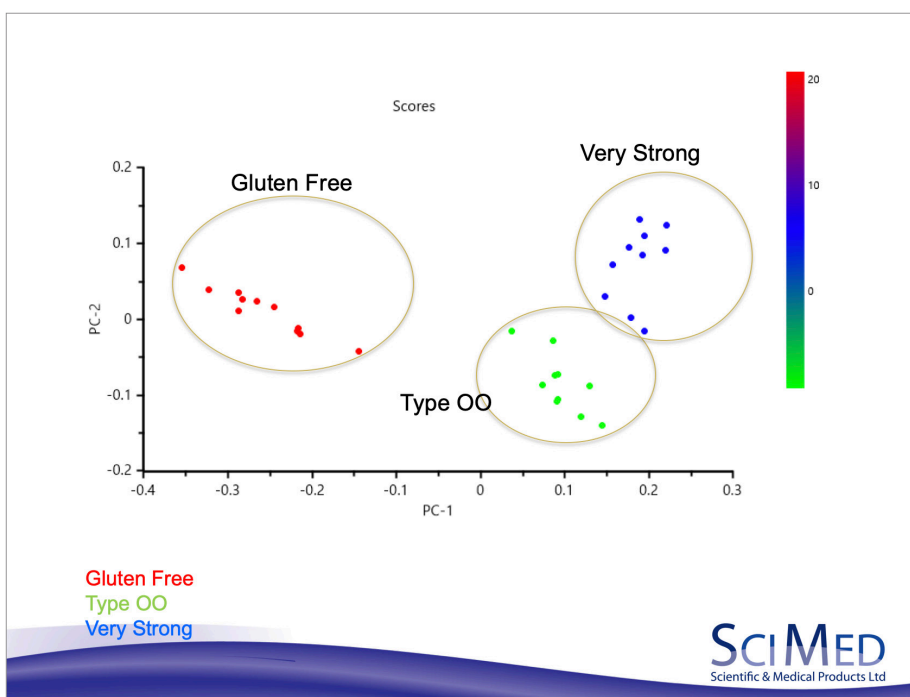
More information on Neogen's allergen testing kits can be found on their website: <http://foodsafety.neogen.com/uk/allergens>

An alternative to manual testing is online testing that can be integrated into your manufacturing production equipment. Technologies such as NIR (Near Infrared Spectroscopy) can provide real-time allergen validation during production. Results can be stored digitally for later analysis or monitored during production to give you constant validation.

The main advantage of this route over hand-held systems is that production doesn't need to be halted. The NIR device automatically provides real-time data via the equipment as production continues. There's no risk of compromising the ingredients by opening up the equipment at various stages to swab or remove samples of materials which can result in contamination issues.



The NIR Testing device attached to the lid of an IBC



Technologies such as NIR (Near Infrared Spectroscopy) can provide real time allergen validation during production. Results can be stored digitally for later analysis or monitored during production to give you constant validation.

Graph showing the presence of Gluten in a mix.

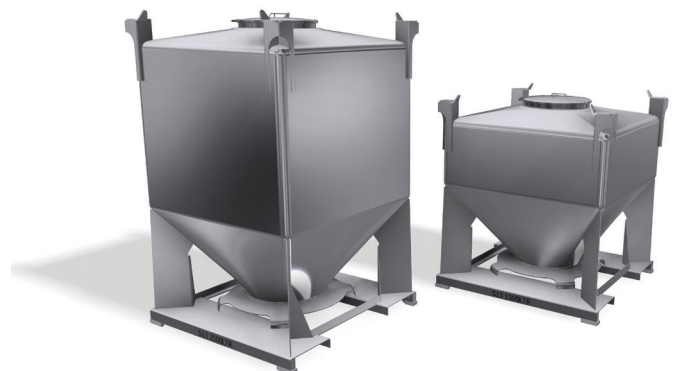
Decreasing contamination risks

Contamination risks are mainly caused by the transfer of allergen containing ingredients from:

- one vessel to another
- one factory building or zone to another
- operator clothing
- mislabelled ingredients
- airborne powdered ingredients (dust)
- human error tipping the wrong ingredient
- insufficient cleaning
- difficult to clean equipment

This cross-contamination jeopardises an entire production process and is difficult to discover, isolate and then remedy. Prevention is always better than cure but how can you allergen proof your facility?

Matcon IBCs are expertly engineered stainless steel containers that are optimally shaped to ensure there are no materials left in the bin or trapped in corners. With both wet and dry-cleaning options, IBCs can be fully cleaned and dried, then tested for allergens before being put back into production.



Having a versatile powder handling system that performs to a high standard while adapting to future changes in allergen handling legislation is essential.

Future Proofing Your Factory to Handle Allergens

Whether planning a new facility design, expanding your building or making efficiency changes to your current processing lines, manufacturers are rewarded when they future proof their factory for success.

Knowing the key considerations at the start of any project is fundamental to its success. Allergen control is a prime example of something that should be considered at the outset of any factory plan. Failure to get it right can be costly, especially if you have to add elements retrospectively. Having a versatile powder handling system from the start that continues to perform to a high standard while adapting to future changes in allergen handling legislation is essential. Investment in the right system will preserve your prominence in this competitive market while realising a true return on your outlay for your materials handling equipment.

Here are some essential points to consider when you plan your next project:

- Involve your operators and factory floor employees. These are the people that use your equipment daily so will know the pitfalls, common areas where mistakes can be made, time-consuming processes and wasted product areas. Your employees may have ideas about new processes that increase your efficiency.
- Know how your product moves around your facility internally and externally; think about clean/dirty factory zoned areas, and what are the allergen control risk areas?
- Do you have validation points at each stage of your production process?
- How is equipment dismantled for cleaning and maintenance? Can everyday operators do this without the need for engineers or specialist tools?
- Are you planning cleaning time efficiently? Consider how much downtime is taken up, the number of recipe change-overs and the handling of potentially harmful ingredients. If you need to clean regularly ensure it's not wasting valuable production time.
- Be open to new technologies and don't just stick to e.g. a fixed mixer if that's what you are used to.

Assessing Your Facility

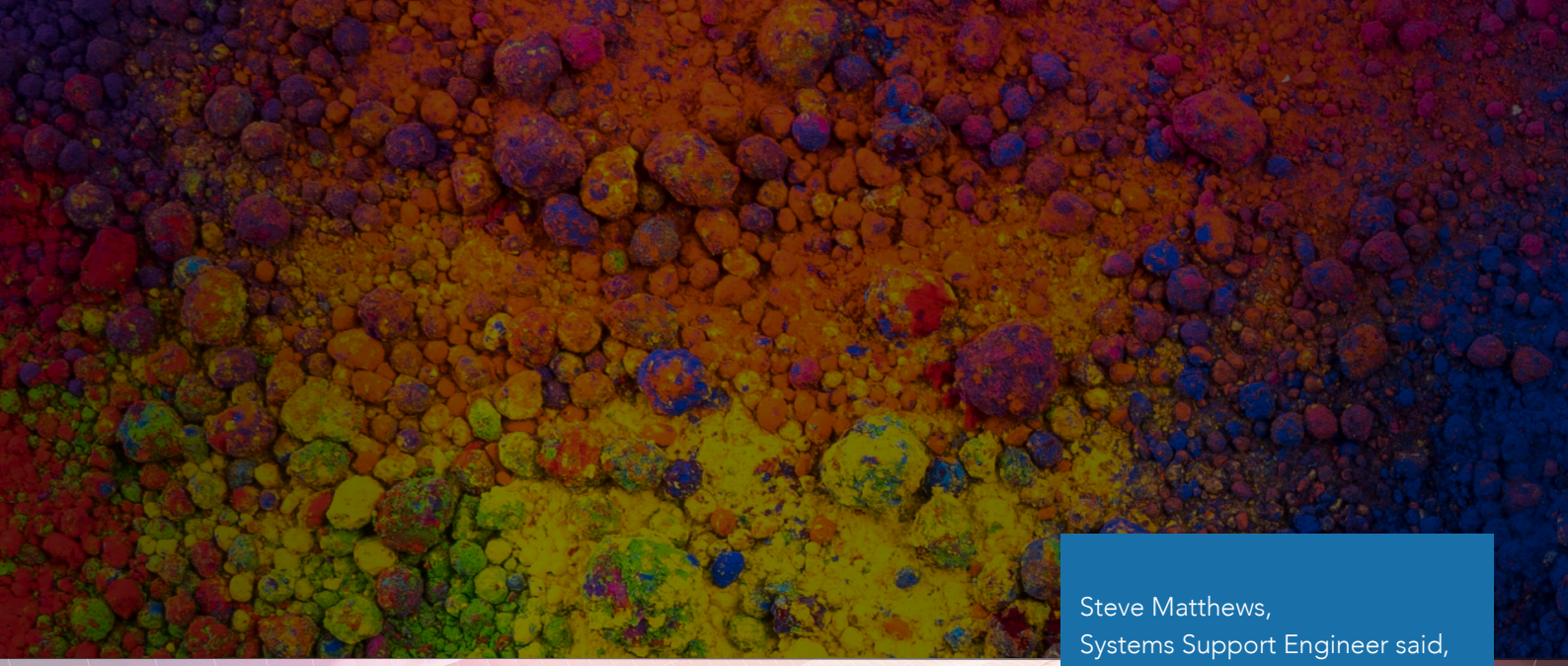
“My allergen handling methods need to be improved but where do I start?”

Adele Adams, a consultant who has worked in the food industry for over 20 years and helps manufacturers train their operators, states that the numerous assessment and analysis methods available to manufacturers contain so many guidelines and time-consuming practices which can make them confusing and difficult to follow. Her advice is to start mapping the material and supplier chain, tracking your ingredients from beginning to end.

Adele also advises that whichever assessment methodology you follow, always ensure that your processes clearly describe what you have done and what you do with your documentation. Additionally, do not rely on paper documentation as it is easily lost or unclear; use and backup digital systems so you have the proof of your own integrity and make sure you back them up.

“Do not rely on paper documentation as it is easily lost or unclear; use backup digital systems so you have the proof of your own integrity.”

- Adele Adams



Steve Matthews,
Systems Support Engineer said,

“Listen to your operators,
listen to the people who
work in the facility day-to-
day, they know what works
best and where efficiencies
can be made ... ”

Clear Labelling

In Adele’s experience the usual reason behind allergen complaints are from “inaccurate labelling and human error.” Training your employees on integrity and the importance of allergen risk prevention is imperative.

Adele believes that companies should take a step back and reassess their processes to ensure that:

- a. What’s in the product is in the product
- b. What’s not supposed to be in the product isn’t in it
- c. Be able to prove it

This sounds simple, but it is surprising how many companies get it wrong or can’t later prove their findings when a case arises.



Continuous Processing

Is it the correct method for you?

If you produce high volumes of the same products without the need to regularly change recipes, then a continuous processing line is likely to be the most effective method for your facility. This will reduce manual handling and keep it to a minimum.

The drawback with this type of system is that recipe changeovers result in a significant amount of downtime for cleaning as the whole line is often taken apart.

Cleaning is not always a straightforward process. The need to access difficult to reach areas and the requirement for constant swabbing can result in unwanted downtime. If after a thorough clean, allergens are still present, more time will be lost to re-cleaning.

Further time will need to be factored in for the equipment to dry before it can be re-assembled and commissioned back into action.

Additionally, these 'solutions' may not eliminate allergen risk. There's a risk that equipment could still hold residual contaminants from missed areas or inadequate drying time which in itself harbors contamination.

Modular Parallel Processing

Intermediate Bulk Containers (IBCs) offer a clean, agile method to process, store and transport bulk material solids and are ideally suited to allergen-controlled environments.

As the IBC system is based on using contained vessels to transport the product it allows you to continually manufacture multiple recipes whether they contain an allergen or not without the risk of cross-contamination. Filling, mixing, packing and cleaning can all be done at the same time which gives you the flexibility of varied recipe production, with no downtime, no operators waiting around, increasing your output rate significantly.



Whether manufacturing high or low volumes, Intermediate Bulk Containers offer a clean, agile method to process, store and transport bulk material solids and powders, and are ideally suited to allergen-controlled environments.



Tumble Blending Systems

Manufacturing plants that use fixed line equipment can prove to be problematic, especially when handling multiple recipes that include allergens. A fixed line system will need to be shut down for a wet clean and drying time, on the other hand a Tumble Blending System that uses IBCs can handle multiple changeovers throughout a shift without the risk of contamination. As the IBC becomes the blending vessel, the powders only have contact with the inside of the IBC so the blender itself does not need to be cleaned. This reduces downtime and the risk of cross-contamination. It is only the IBC (which is taken off-line) that gets washed.

Tumble Blending offers highly flexible manufacturing capabilities enabling different recipes to be mixed one after the other in containers with almost instant changeovers. The blender will go straight back into action with another batch. The IBCs that are used to transport materials throughout production can be cleaned 'offline' which means no downtime.

Tumble Blending offers highly flexible manufacturing capabilities.



Get Dust under control

As an IBC system remains closed at all times, even during the discharge process, the risk of dust being created or entering the system is significantly reduced. This means that allergens can be handled in the same building, thereby reducing the need for separate areas or hygiene zones.

Automation and real-time analysis

Human error can be eliminated through the use of smart automation technologies. Bar-coding of ingredients and IBCs can be set up so that only the right ingredients make it into the recipe batch. This not only ensures the correct recipe is formulated but ensures delivery of the correct blending times and washing requirements to safeguard that materials are handled correctly without the risk of human error.



Future Proof Your Manufacturing

Embracing new technologies can ensure that your production facility is future proofed to handle allergens bringing benefits such as:

- Increased containment levels
- Batch traceability during production
- Batch traceability of finished goods
- Validated operations, particularly washing
- Ultimate flexibility
- Recipe changeovers
- Batch size
- Parallel processing



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MATCON[®]

POWDERS, HANDLED.

Why Choose Matcon?

Working with a broad range of manufacturers to deliver flexible manufacturing systems for some of the world's largest brands since the 1980's means we not only understand the challenges faced by manufacturers but solve them on a daily basis.



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