



8 KEY POINTS TO CREATING AN OPTIMIZED FRUIT PACKHOUSE AND AVOID BUILDING A HOUSE OF HORRORS

WHITE PAPER



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Paul Ramson, Director Solutions Architecture, TOMRA/Compac

Over the years I have engaged with 100's of customers about new projects, new packhouses, and seen almost every kind of installation possible. Building a packhouse is a massive undertaking both financially and emotionally. For most smaller or family run operations the stakes are even higher, they are not just building as a financial investment, they are building legacy, a new facility designed to pass down through the generations.

1. KNOW WHAT YOU WANT

With a decision of this magnitude it is critical to know what is important before you start. There is no single blueprint to follow and getting impartial and unbiased advice and guidance is a challenge.

Our industry is filled with big personalities and everyone is an expert, and usually more than willing to give you their opinion. While there is a lot of value to this advice, do not be trapped into always looking backwards. While it is very important to understand what already works, you also need help looking forward. Creating a design to meet the current requirements – legislatively, customer base, packing standards, current volumes – is easy. However, will your business look the same in three years? Five years? How about ten or fifteen?

The starting point for most new packhouses is to take a good look over the fence and see what the neighbors have been up to, and while this is a sound strategy, you must remember that this is usually a look backwards in time.

No one has a crystal ball, and the only certainty is change, but even that knowledge is powerful, enabling you to engineer modularity, stage investment and growth-potential into your design. Building a packhouse with

modularity and future flexibility at its core will enable you to maximize your investments and successfully adapt as the market evolves.

It is vital that you look further than the next paddock, both in your ideas and in your vendor selections. Our industry is prone to believe that 'our current way is the best way', and everything is based on the 'tribal knowledge' of yesterday. What you need today, might be different tomorrow, and embracing this ability to morph and change is vital to the long term health of your business. One of the things I find fascinating is seeing how things are done in different geographies and across different commodities. Ideas seem to cluster in regions and markets but struggle to transfer elsewhere even with their merits. Remember that looking over the back fence and simply taking a 'me-too' approach may seem the safe option, but to be truly successful you need to differentiate yourself – leading the way, rather than following, with a holistic and long term view.

2. EMBRACE DISTRESS EARLY

Perhaps the first hurdle to overcome is when to buy. There can be many triggers from failing infrastructure to booming new market opportunity. But in my experience the thing that most new Packhouses have in common is that no one buys without being in 'distress'.

Whilst not a true hard and fast rule, the 'desire to purchase' usually turned to a 'decision to purchase' when there is no more room to delay.

Distress typically seems to be either production needs i.e. I have more fresh produce than production capacity from



existing equipment or OEE based - I can't condone the risk on my existing equipment getting me through another year of packing.

However other factors are creeping in including:

- **Diversification of product type from the consumer trends** – I need new equipment to make that product or address new markets.
- **Compliance issues** - I need my equipment to be compliant to my market requirements. Able to be cleaned, food safe and remain compliant in a shifting regulatory landscape. Global compliance meeting could allow new market entry in the future.
- **Labor availability** – I can't get enough people or the right skills to pack my fruit. Labor costs are rising so I need to automate that aspect of my line. Especially difficult are the labour areas that require decision making and experience like grading, production planning, and operation.
- **I need to be prepared and harden my operations for exceptional circumstances** – COVID for example.
- **The produce is changing** – New or more varied defects are placing additional strain on my process.
- **Changing customer demands** – Packaging or grade standards have moved beyond my equipments ability.
- **I am too successful** – My business is growing and I need faster, bigger equipment to keep pace.
- **Market pressures** – I must look to technology for additional profitability and a one up over my peers.

Whatever the trigger there will still be underlying frictions. Our industry is a dynamic one and there are

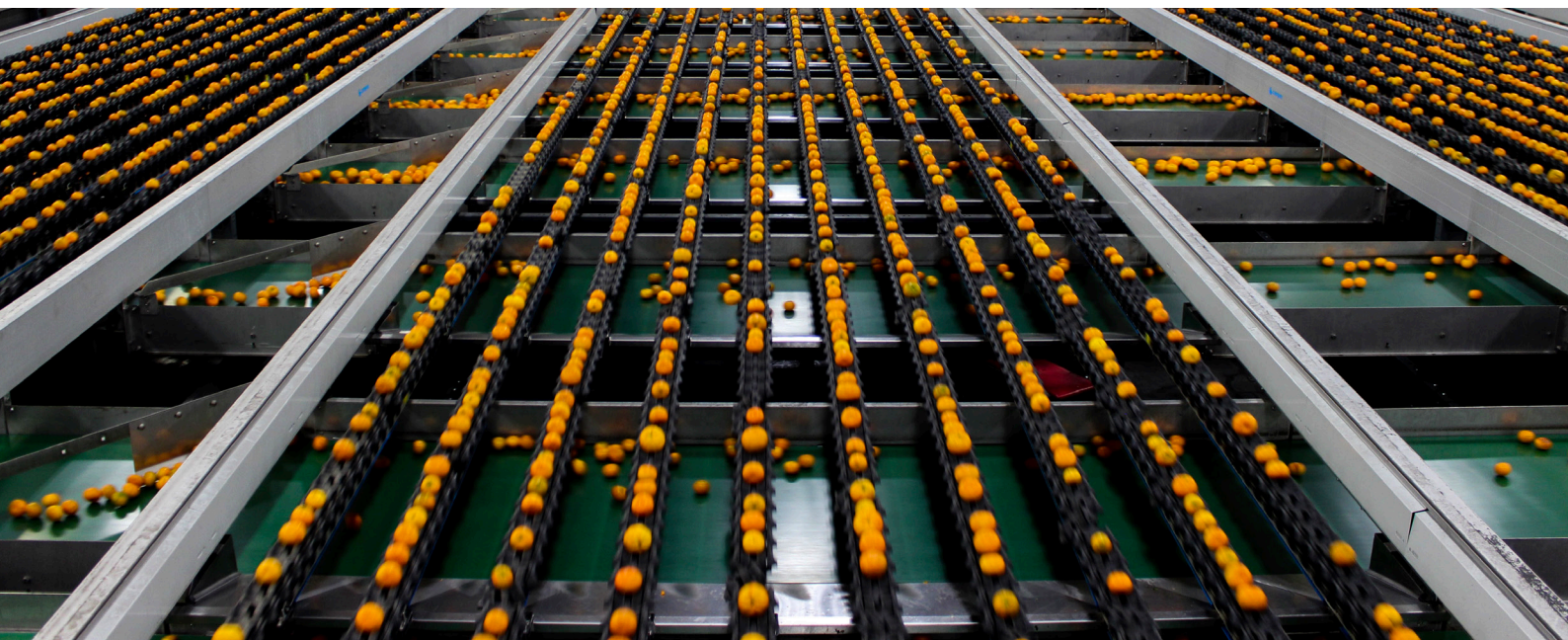
always new and exciting areas to invest in, as well as both consolidation and diversification opportunities. Every time packhouses or packing equipment purchases are on the table, there are several other items competing for the same capex budget for that year. I have seen plenty of customers not pick the packhouse investment this year to divert resources elsewhere.

This is just the nature of our business, balancing needs across different operational areas or choosing to sweat assets to maximize profitability are sensible strategy. There is however a fine line. Where you must be careful, is that you can end up putting yourself in a corner. Once you hit the distress point then you are committed and working against the clock. If you want to build a world class facility, then you must leave yourself the breathing room to do it properly – Rome was not built in a day. You must be bold and make sure that you have the time needed to truly realize your vision, gather your requirements, find your advisors, and develop your goals.

If you do find yourself in this rushed position then don't sweat the small stuff. The focus should be on what can't be changed later without significant reinvestment – the technology, the stages, the process, the vendors are the critical calls. The small engineering level details can be changed, optimized or easily improved once you have built a solid foundation.

3. SOMETHINGS THINGS ARE NOT WHAT THEY SEEM

Let us just look at the current situation with COVID. Initial reactions were that packhouse developments would be frozen due to market uncertainty, and owners choosing to sweat their assets and waiting to see what happens. This is perfectly sensible, and undoubtedly was the initial reaction for many. However, we have seen strong demand for fresh produce remain, along with a renewed need to automate processes, or at the very least, to reduce the amount of people shoulder-to-shoulder on the grading



and packing tables. Because of this, we have seen demand growing and a sharp increase in order intake. Now, six months on, we are seeing the opposite to the original logic unfold. The logistical challenges for new installs, combining with increasing orders has created a situation where demand may soon outstrip supply. This is already creating competition, with installs being brought forward as customers start their projects through fear of missing out.

The positive side of this is that our industry seems to be responding well to the challenges of the pandemic, and the demand for fresh fruit remains strong. The cautionary point that I am making is that if you were waiting until you are moved into 'distress', if your production was already on the red line, then what happens when the situation around you changes? Take a fresh look at where you are and ask what is the opportunity right now?

4. NEVER SETTLE FOR JUST 'GOOD ENOUGH'

Distress as a trigger and the consequential time constraints created will inevitably lead to compromise. If you have followed the previous steps then you are going to execute on a forward-looking and flexible vision to match your business goals, with security on your timeline. If not, the focus should never be on simply getting the job done, you must remain laser focused on getting the job done right.

There is a myth in our industry that we should settle for "good enough" but this notion is completely fictional and anyone that mentions it to you should be challenged on why you don't deserve the best? Good enough for what anyway? Good enough to meet our current throughput requirements, current customers' grading standards, current commodities in production, good enough to get some fruit into a box and out the door – well that is just the basics! Packhouses build their profitability on their ability to maximize their pack out, minimize waste and reduce give-away.

Getting to 80% is easy, 90% readily achievable, anyone can do that, the true art and science is realizing that final 10%!

This is where you must be very careful as people will tell you that small gains are not worth the effort and investment to realize them. Yet our business is a volume game. Think of the volumes that will pass across your machine in just one year? Now multiply by the expected life span of the machine, ten to fifteen times. Just a small percentage gain at those volumes can be the difference between being good and being great. Between doing OK for yourself and building a legacy for generations. Between average and being a true success.

5. DO NOT BE FOOLED... 'GOOD ENOUGH' IS THE ENEMY OF 'GREAT'!

Just as a simple illustration. You are able to make your customers' grade standards but are suddenly able to move just an additional 1% of your production into your first grade, then on a typical machine we've modelled, you could be realizing an additional \$250k a year as Pure Profit. Multiply that across the 10 to 15 years minimum expected lifespan of a machine and you can see that we are talking about huge money versus the upfront investments, and that paying attention to the small details can equate to some big payoffs.

Even if you want to dispute my calculations and cut these numbers in half, you can still easily see that "good enough" is just not good enough! In fact, the opposite is typically true, there is often a lot more than 1% to play with and it shows that it pays to be pedantic and to demand the best accuracy and tightest processes.

When you design a packhouse it is essential that you do it right by focusing on the processes that make you money as much as the ones that cost you to operate. A little initial investment can have a huge pay off over time, but you must pay attention to the small margins as it is these that add up to the big gains. It is essential to make smart investments and understand the ten-to-fifteen-to-twenty year operational life of your investments. The ROI equation is simple, do not try and save cents in your initial setup, at the cost of dollars later, don't focus just on the costs, but also on the profits.

6. BUILD FOR TOMORROW NOT TODAY

In the long run, there will not be not enough food to go round, today is going to be significantly better than in 10 years time. The waste through the supply chain is astronomical and in the packhouse we should be doing everything to not shrink the incoming to the outgoing. Use every piece of fruit, give it the right home and maximize its value.

The current industry model is to reject out fruit from the good stream as many times as required to hit the clients grade standard. Multiple passes, multiple decision makers, good enough systems for today are everywhere. This is wasteful of two precious resources – Your produce and

profitability. It's important to value every piece, to have the tools to diversify, find new product lines for your brand, and have value cases for all produce that enter your packhouse.

The diversification of produce approach can be extremely profitable, and we are seeing it more and more. There's unique value in every piece of produce and you need the tools to realize it. For example, apples that don't make first class for their exterior get separated not just into juice grade, but peeler – e.g. ugly skin but, good internal. Or mini avocados that were so small they would have gone to process, are now being marketed as a high value 'one serve' healthy snack.

There are hundreds of these examples and even if you do not have similar use-cases yourself right now, it is a virtual certainty that you will find some over the next ten-to-fifteen years. The question then simply becomes, will your packhouse have the flexibility to exploit these new opportunities, the modularity and multi-commodity ability to move your processes, increase your separations, or are you locked into today's design and unable to adapt without starting again?

7. ALL-IN-ONE VS BEST-IN-BREED: WHICH IS RIGHT FOR YOU?

In today's market, packhouses are offered an incredible range of solutions to meet their needs. There is a growth in niche markets occurring with new solutions and innovations for things like palletization, labelling, packaging, automation and robotics springing up all the time. The real question that needs to be answered is how do you find the best solution and approach for your specific business?

Do you choose the single company supplier approach to your packhouse equipment? Or, do you choose an integrated approach with multiple vendors and specific application, a.k.a best-in-breed?

Having traveled the world and seen so many unique and innovative solutions to packing fruit, it is my opinion there is no one company that can deliver all your needs by themselves. No one can be the best at everything, but often they'll say they are 'good enough' at everything.

Some of the challenges that I see with the single supplier approach are:

- There are limitations to the offering available. Features are missing, portfolio gaps exist. Your desired process must change to match the performance and features of those products that are available from that one supplier. You're trading perceived ease of interface with getting exactly what you want.
- On the flip side to the above, the option you want from that one supplier is completely featured, highly

developed and more than you need. You're being asked to pay for features your business will never be able to use or take advantage of as they are built into that product or option.

- Overall, you are asking one company to hold all the expertise for all aspects of the business and include in your one commercial interface all that knowledge, whether fruit, materials handling or infrastructure related. Packhouses are extremely complex and varied with multiple go-to markets. Having a single vendor encapsulates all of this knowledge and will result in the boilerplate type copy paste examples, not tailored to your business.
- When choosing a one-stop-shop vendor, businesses may experience the "vendor lock-in" feeling. This is specifically important if you have not engineered in the flexibility and modularity you could need. Remember this is a 15-year + relationship for many pieces of equipment.
- Innovations in products and features are paced by the vendor selected capacity and may take time to catch up with the needs of your business. A one-stop-shop has to focus across a broad range of topics and isn't focused on your industry or your needs. Innovation will be slower, especially in technology approaches and fast follow products, complete replacement instead of upgrades will be more common as forethought in development wasn't available.
- This single supplier approach may make the packhouse more vulnerable to a single point of weakness, as any existing flaws in their products or issues are often common across the entire suite.

While the one-stop-shop approach can work, to me it is just not exciting. If I were building a packhouse I would want to know that it contains the best possible solutions and, more importantly, I will have access to focused future innovations that matter to me and my business over the life of the equipment.

Taking a best-in-breed approach means selecting the best product that will meet all your business requirements without compromise. With this approach, your business will select the best solution—typically in its referenced niche or category—with the expectation that it will perform a specialized function better than an integrated system.

The success of this approach hinges on your ability to work with a partner provider capable of successfully integrating third-party products, training, service and upgrades to ensure the products are not only the best, but the best fit - work together.

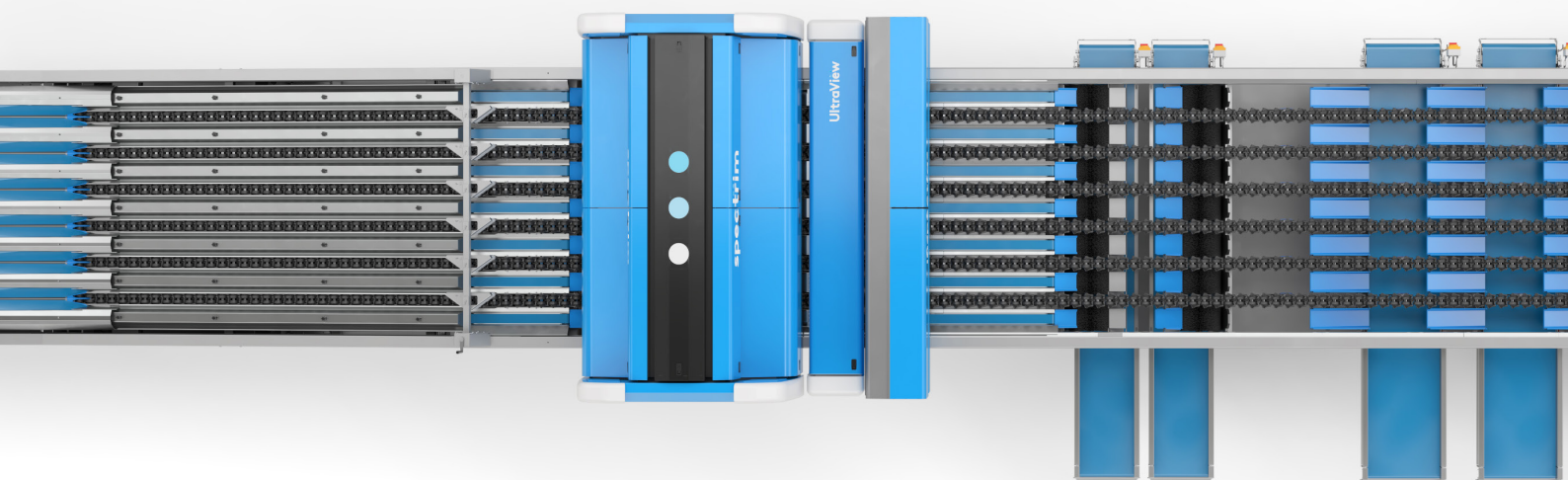
There are pros to the Best-in-Breed approach:

- You should be able to meet all of your defined requirements, and then some. Typically, you will discover more capabilities than what you were originally aware of, and/or had defined. These will tend to be the differentiators between competing vendor products, and that will guide you to new requirements unique to your situation.
- The function of the solution is geared to one specific purpose, your purpose and therefore, should deliver better results.
- Working with specialist providers forces the foundation of the solution to be more agile/modular and quicker to adapt to change. This enables businesses to quickly respond to changes in the market in the future.
- Any solution updates, or additional building blocks can be rolled out without affecting other systems. You have the freedom to continue innovating as your business needs change.
- Each component of your line is typically smaller and focused, consequently, the implementation time can be shorter for future updates or changes. A shorter implementation time will help reduce project risks, and the ready solution will provide value to the business more swiftly.
- As these components are smaller, your business or architect can more closely align the solutions as outlined in your business architect strategy and/or vision.

As a technologist, I lean towards this best of breed approach. Hybrid commercial models such as a best of breed turnkey mitigate a lot of the commercial concerns, providing that 'one throat to choke' and removing the complexity of managing multiple vendors but still allowing for that custom selection of product portfolio and model to best match your situation.

Ambition should never be your limiting factor, and you should build in the capability needed to become an industry leader. Go and visit the world's leading packhouse – and not just the biggest by volume, but the most successful in any given niche area of interest. Learn from their processes and professionalism. The attention to detail and their heightened understanding that even the smallest gains can be significant. Each of these leaders has a 'niche' statement about their business. They are biggest, the most organic, the only one that packs this SKU type for this vendor at this grade level and the ability to create this statement stems typically from in house innovation and a combination of unique vendors and products, coupled with hard work. They are the 'best' at what they do and they got there by being unique and tailored. The flexibility and modularity needed to exploit the niche opportunity markets must be built into the fabric of your packhouse.

If there is one thing that my experience has taught me over the years, it's this: The varieties or pack-types that you are packing now will not be the same or only ones you are making your money from in ten-years-time.



8. BUILD FOR A DIGITAL FUTURE

When considering the physical construction of a packhouse we put a lot of energy into mechanical performance but what about the digital necessities of tomorrow. When you contemplate the changes we have seen in the last five years, you realize what's to come over the next fifteen.

Gazing into my own crystal ball I can see massive advancements in automation both in the paddock and packhouse. However, where I think that the biggest evolution will come is in the way we value data and the role it plays in the future of food production. Data will eventually become one of our most valuable assets, helping us manage waste reduction, food safety, and sustainability on a global scale. In the future we will become 'data farmers', growing and cultivating our data with as much love, care and attention as we pour into growing our produce.

The integration of the supply chain with sensor and reporting technologies is already improving traceability throughout. Many products found on the retail shelf can already be tracked back to the exact supplier and batch where they were produced, but are lacking granularity beyond that.

Traceability has implications for Food Trust and source or origin-based marketing, enabling increased brand loyalty.

The next phase in this evolution will be to leverage existing data with external sources and artificial intelligence, in order to surface previously unseen correlations and insights. As we look forward, a data-augmented grading and sorting process will play a leading role in maximizing delivered value by analyzing every piece of produce that runs over it. Not only will this maximize the efficiency and profitability of our processes, but also ensure that we can rise to meet our challenge of exponential population growth.

This is a big topic in itself and to avoid this paper becoming War and Peace I would point you to our [e-Book](#) if you would like to read more on this topic.

YOU ONLY GET ONE CHANCE TO DO IT RIGHT ONCE FOR THE MAJOR TECHNOLOGY PIECES – YOUR CHECK LIST FOR SUCCESS!

The smaller engineering decision can always be changed but, it is essential to get the major technology and process pieces right first time. If you don't, then the best you can hope for is a patch-work Frankenstein operation, and at worst a house of horrors. Given all the above factors, I've come up with a list of considerations that you should make when planning out your packhouse or purchasing new equipment. To help you prioritize I have ordered them in increasing levels of importance:

Buy for today – (Least important, but this is the typical stage of consideration that customers reach)

- I have a minimum set of performance criteria, features and requirements that I need to meet.
- Local service and support.
- Learn from the line over the back fence.
- Value – Don't just look at cost today. Look at the full life cycle of profits and investments over time.

Buy for tomorrow – (Medium importance and a few customers reach here, the rigorous ones)

- Adaptability, flexibility, growth capacity of the equipment. Typically, every 3-5 years you'll need to reconfigure some equipment to keep up with consumer driven industry trends and automation/technology improvements. Today's trends is automation, tomorrow's may be food safety. Having a base platform that can be reconfigured, adapted to these new items (that didn't exist at packline design inception) is an amazing advantage to the owner.



- Roadmap – You want a company that has a roadmap that is cutting edge. They need to have items on the horizon that allow you to be the first to enter and dominate your existing or new markets. Demonstrated and regular improvements. SAAS, Digital, optimizing products are the food of tomorrow.
- Value – Don't just look at cost tomorrow. Look at the full life cycle of profits and investments over time.

Buy for the future – (Vital importance, these are the considerations that don't seem to make it but are what make the difference between Good and Great)

- Value – Must be in this time period, not in today (where you typically only consider cost), not tomorrow (where you only look at a short time scale, a piece of the profits and most of the cost), equipment lasts a very long time. It will have many uses. It needs to make you more money than it costs, it might cost more than you like to start with, but you need to look over its lifespan. OEE, product performance, upgrades, extensions. Any ROI measures that I've participated in with customers are always emphasizing the tangibles and the short term, immediate labor reduction, cost of equipment, operational throughputs and don't consider the intangibles – compliance, safety, modularity, brand security and most importantly extra fruit in the box.

- Security that the company is still going to be there in 10 years time and that you want to be associated with them for 10 more years. Are they transparent, responsible, ethical?
- Scale of R&D – Look beyond the roadmap. It's not flash in the pan, it's not about fast follow, there is a development debt that can't be countered to the core technology pieces and in the background of the best equipment suppliers are non-publicly road-mapped research programs of the most amazing things coming for the fruit industry. What happens if your market breaks open with the next technological leap and you've 'backed the wrong horse'.

Packhouses are packing more produce, more efficiently, than they ever have before and this is a trend that will only grow as we move forward. Understand where you need to be in the next ten to fifteen years and then set a vision to take you there... but whatever you do, do not settle for “good enough”, build something great!



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Paul has over 15 years of experience in the food technology industry. He has held a range of technical, consultative and executive functions, including key management roles, product development and product strategy. His background is in engineering. Since joining Compac, Paul has developed a deep domain of industry and technical knowledge and is now recognized as one of the fruit industry's foremost experts in packhouse design and optimization. For more information see Paul's recent article in the Packer 25 <https://www.thepacker.com/article/packer-25-2020-paul-ramson>

COMPAC

Compac provides integrated post-harvest solutions and services to the global fresh produce industry using the world's most advanced grading technology. Combining industry leading solutions with award-winning grading platforms like Spectrim, the company's mission is to enable its customers to improve returns, gain operational efficiencies, and ensure a safe food supply via smart, usable technologies. To achieve this, Compac operates centers of excellence, regional offices and manufacturing locations within the United States, Europe, South America, Asia, Africa and Australasia.

For further information about how to take your next steps towards creating a, forward-looking strategy for your pack house, visit us at www.compacsort.com.

Compac is member of the TOMRA Group that was founded on innovation in 1972 that began with design, manufacturing and sale of reverse vending machines (RVMs) for automated collection of used beverage containers. Today, TOMRA has ~90,000 installations in over 80 markets worldwide and had total revenues of ~6.6 billion NOK in 2016. The Group employs ~3,500 globally and is publicly listed on the Oslo Stock Exchange. (OSE: TOM). The TOMRA Group continues to innovate and provide cutting-edge solutions for optimal resource productivity within two main business areas: Collection Solutions (reverse vending and material recovery) and Sorting Solutions (recycling, mining and food sorting).

For further information about TOMRA, please see www.tomra.com.