

ATTACK PACK

DATE: 31.9.09	INDUSTRY: Engineered Wood	STATUS: Approved
 Wanner International Ltd		

INTRODUCTION

WARNING

Before progressing any further, please mount the enclose CD in your computer.

What is an Attack Pack?

“Everything you need to make the sale”

Attack Packs are intended to focus all our efforts on areas of good profitable potential business. In order to assist you in achieving this potential and making the sale, we will endeavour to provide all the necessary background information and detail... in the form of “Attack Packs”.

We are all aware that “success breeds success”. Attack Packs are a means by which success in one territory and by one distributor may breed success in totally different geographical areas by different distributors.

Each “Attack Pack” is based on one specific application in one specific industry, where we know that the use of Hydra-Cell® has proven benefits and the potential for significant sales. Through the Attack Pack we intend to use the experience we have gained in specific applications in order to help generate more business.

“Attack Pack: A means by which a successful Hydra-Cell application can be replicated in other geographical areas.”

How do I report?

The CD contains the spreadsheet containing your target opportunities. You should copy this to your computer and update it in the relevant fields as progress is made. Once a month, please attach the file to an email to me. This will enable me to collate all the information, monitor progress and report back on successes to give the project further impetus.

The spreadsheet has been designed with pull down menus in some instances in order to simplify the updating process but specific points or calls for action should be highlighted within the body of the email.

Many thanks

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BRIEFING NOTES 1

Tips and suggestions on the approach you might adopt in order to maximise the benefit of the “Attack Pack”.

Step 1) Familiarise

Read and understand the contents of the Attack Pack

Step 2) Verify and supplement the data

Ad your own experience and expertise to the project

- Add to the target list any other potential targets that you know about.
- If you already have Hydra-Cell pumps in this application, add to the list.
- If you have experience of the application and have selling points not covered, feed back to Wanner International.
- Make telephone calls to verify the information provided.
 - Is this a manufacturing plant?
 - What products are produced?



Step 3) Telephone call – Objective is to get a meeting.

Find the person responsible for specifying pumps.

It will usually be one of the 3 functions listed below. Each will have different interests and motivation.

What will interest the customer?

1. Production Manager - Maximisation of production;
 - No unplanned maintenance
 - Reduce frequency of maintenance
 - Reduced energy costs

cont...

BRIEFING NOTES 2

...cont

2. Maintenance Manager - Reduced stress!!
 - Reduce maintenance costs
 - Reduced “panic” breakdowns
3. Production Eng. Manager - Process Consistency
 - Applying the glues in a consistent and controlled way
 - Reduced energy costs

All 3 could be important in making the decision, but one of these 3 will be the most important and have the best motivation to help you. It will be different for different factories.

During the call use some information from the Customer User report to get some interest.

1. The problems seen in handling & pumping the adhesives.
2. Reference the Company Hydra-Cell is installed, and the benefits they have seen.

Do not give all the information away, save some for the meeting!

One of the key features of the Hydra-Cell is it is “Seal-less” unlike the pumps the customer is currently using. Use this fact to generate the interest for a meeting.



Step 4) Meeting

Objectives:

1. To confirm the key people making the decision, and the people who will need to support the decision.
2. To identify a part of the customers process where Hydra-Cell can show value.
3. Using implication questions to build up and maximise the value discovered.
4. Review and confirm the “Pay off” achieved in using Hydra-Cell.

cont...

BRIEFING NOTES 3

cont...

During the meeting using a template such as Appendix A can help to gather the right information during the meeting. It will also help to construct a good quotation and help inside sales roles to follow up.

To identify a part of the customers process where Hydra-Cell can show value.

1. Find out what type of glues and resins they use and what types of pumps they are using and duty points.
2. Use the resin characteristics table in the brochure to prompt a discussion on the customers' process and what he experiences.
3. Use the selling "Cheat sheet" which shows Why Hydra-Cell? compared with other pump technologies, to prompt discussion.
4. Use the "User report" to prompt discussion on the customers' process.
5. Ask "What is important for them in this part of the process?" and "Where would they like to make improvements?"
6. Do not use the word problem until the customer does!
7. Find out about their maintenance program for the glue pumps. Maintenance and break downs are often confused by the customer. Make sure you identify the different situations as.
 - Maintenance is planned
 - Breakdown is unplanned and leads to stress
8. "What are the common causes for maintenance and breakdown?"
9. How often is the pump damaged due to operator error, running dry for example?"
10. Ask "What parts do they have to replace during maintenance?"
11. Ask "What parts do they have to replace during breakdown?"
12. Ask "What is the time to repair the pumps?" "What are the parts costs?"
13. "What procedures do you have to carry out during a production run to keep the pumps operating?"
14. "How many customer returns due to quality issues do you have in a year?"
"On investigation what have been the issues?"



cont...

BRIEFING NOTES 4

cont...

Using implication questions to build up and maximise the value discovered.

Implication questions are important as they help to raise the importance of changing the pump. It might be item 20 on the customers list, but you need to elevate to within the top 3 items on his list.

- “What is the sq meters per hour produced by the line and how much will that sell for?”
- “For a pump breakdown, what is the average time to get the production line up and running?”
 - “How does this affect the productivity of the factory?”
 - “How does this affect your service levels to customers?”
 - “How does this affect your material usage, and material wastage?”
 - “What is the value of scrap material due to breakdown?”
 - “What is the cost of reworking material due to breakdown?”
- “How much value of stock of pumps and spare parts do you have to carry?”
 - “How much money does this “tie up”?”
- “How many times a month do you have to carry out maintenance on the pumps?”
 - “How does this affect availability of maintenance staff?”
 - “What impact does it have on your maintenance budget?”
- “How many customer returns due to quality issues do you have in a year?”
 - “What needed to be done to rectify situation and what were the cost implications?”

Once you have identified the areas to improve, use:

- User report
- Industry specific literature
- The presentation CD
- A cut away model
- A dry running demo – P200 is a nice compact way to show this.

... to show the features of the Hydra-Cell pump which will give the customer the value. Also the references to show the customers competitors are benefiting from the advantages Hydra-Cell offers.

Review and confirm the “Pay off” achieved in using Hydra-Cell

- From the discussion, list out the benefits and value discovered during the discussion.
- Confirm with the customer; where possible add real values to each of the benefits.
- Writing them out in front of the customer will confirm his commitment.
- This information should then be placed in the written quotation.

Agree with the customer the next actions.

Meeting Information Notes

Key decision makers

Supporting decision makers

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Notes on current process liquids, pumps, process parameters etc

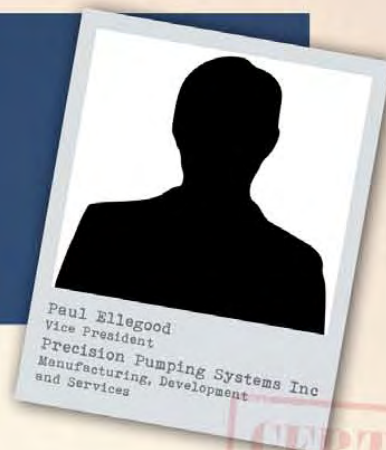
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Identify parts of the customers' process where Hydra-Cell can show value.

Item	Cost / Time spent	Further implications	Cost / Time spent

ATTACK PACK

FIELD REPORT



Report from Agent Ellegood... our Man in the Field

Hydra-Cell® vs. Gear Pumps

When Pumping Amino Resins and Polymeric Diisocyanates.

Urea-Formaldehyde resins make up 80% of the amino resins used in the world and are the prominent chemistry in the manufacture of particleboard, medium density fiberboard and hardwood plywood. They are also used as a laminating adhesive for bonding in many other engineered wood production applications. Other common resins include Phenol formaldehyde resins, which are used in "Bakelite" (Polyoxybenzylmethyleneglycolanhydride). Not that it really matters all that much for the purposes of this document, but how often does one actually get to use the word "Polyoxybenzylmethyleneglycolanhydride"?

A couple of important properties of amino resins to keep in mind are their low cure temperature, their gel time and the acidic environment in which they exist during handling. A little known byproduct of the interaction between urea and water is sulfuric acid. These resins are usually handled in a concentrate form. Viscosity normally runs 200-850 Cps at room temperature. Specific gravity is around 1.3.

The Problems with Gear Pumps

The construction of gear pumps is inherently problematic for use with resins for a couple of reasons. First off, in the chemical pumping world, gear pumps use the fluid they are pumping as the cooling medium for the bearings. They use the term bearing but in actuality the radial shaft loads are carried by bushings made of a chemically compatible engineered plastic like PTFE, ETFE, PPS or PEEK. This remains true for the wear plates that take up thrust loads and are also a large part of the pumps construction. Depending on the viscosity and make up, many fluids (in this case resins) aren't very lubricious and don't do well as a heat transfer medium. This can lead to poor heat dissipation characteristics and areas of significant heat loading from both the radial and thrust loads that occur when facilitating the tight running clearances that make this particular pump technology viable. In the specific case of resins, one must take into consideration that they are thermosetting. Urea-Formaldehyde for example can begin to set up when exposed to temperatures in excess of 35°C (95°F) for long periods. A permanent change in viscosity can occur quite quickly. Should the resin set up in the nooks and crannies that are inherent in gear pump technology, then catastrophic failure at some point is a forgone conclusion.

Secondly, Gear pumps require either a mechanical shaft seal arrangement (recommended if using seals) or a mag-drive configuration for connection to the prime mover. In either case, there exist numerous, close tolerance, spatial voids within either the mechanical seal or the running clearance between the barrier that separates driving and driven magnets. Should the resin set up in any of those areas, the result can lead to a variety of maladies ranging from increased amp draw on the electric motor (decreased efficiency = increased operating costs) to shaft seal failure to mechanical lockup to catastrophic failure.



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FIELD REPORT

Assuming that the system is designed well and the correct materials of construction are used, the service life of a gear pump in resin depends less on the manufacturer and more on whether or not the end user installs and fastidiously operates a flush cycle. Some customers consider only the initial flooring costs and in that light many will forego flushing as an automated feature relying instead on maintenance to sort it out. Some forego flushing entirely. Good luck with that.

Pumping Dirt!

Another element that is often overlooked entirely is that by and large, storage tanks, day tanks, totes and drums are notoriously dirty internally. While this fact has no bearing on the discussion regarding resins – it can be a cumulative causation to a gear pumps failure due to the gear pumps inherent requirement for clean fluids.

Cost of Repair

While the initial cost of ownership for a gear pump normally runs close to the cost for a similarly sized Hydra-Cell®, the cost of repair is considerable different. It's extremely rare for a gear pump to lose a single wetted component. That is to say that when a gear pump fails, the end user will normally have to replace the gears, the bushings, the wear plates and the seals. It is quite normal for the repair cost of a gear pump to run 30 to 60 % of the cost of a new pump head. That's in such an instance as the pump can be repaired at all. What we see often is that after each repair, the next life cycle is shorter than the first and so on until the pump can no longer be repaired. If the pump is of a cavity design (most are), then the inner wear surface of the cavity, where the gear tip rides eventually loses clearance integrity due to wear and needs to be replaced. In most instances this will drive the repair cost well in excess of 50% of new – the usual threshold for complete replacement.

The Easy Solution

When we sell Hydra-Cell® pumps, we usually only have to go through one process. We couple a P200 to a 115 VAC motor, bring to the mill, set it on a table in front of engineering or maintenance. Plug it in, turn it on and let it run dry. We talk about fishing for a while then we ask them how long their progressive cavity pumps or their gear pumps could do the same thing? The only thing left after that is collecting the purchase order. We've doubled our sales of Hydra-Cell® pumps this year just as we did last year and the year before that and frankly – we're not all that surprised.

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TOP SECRET

CERTIFIED

ATTACK PACK

USER REPORT

(Case study 1)



PFLEIDERER
AKTIENGESELLSCHAFT



Company: Pfleiderer

Location: Grajevo, Poland

Activity: Manufacture of particleboard panels

600,000m³ per annum

Material Being Pumped: Formaldehyde resin adhesive

Pressure requirement: 80 Bar (1160 psi)

Prior Situation:

- Using high pressure gear pumps to pump resin adhesives to the spray nozzles in particleboard manufacture.
- Leaking of noxious adhesive through worn mechanical seals.
- Worn mechanical seals pull small amounts of moist air into the adhesive causing small solid resin crystals to form.
- Solid resin particles trapped between meshing gears caused excessive pump wear. (one pump and gearbox set had to be replaced three times in a matter of months)

The Hydra-Cell Solution:

- Seal-less design means adhesive is "100% sealed" from the atmosphere preventing it from reacting and forming resin crystals, and degrading the process.
- Hydra-Cell G35 meets pressure and flow requirements.
- Hydra-Cell pump able to handle viscous, non-lubricating fluids and solid particles up to 500 microns with ease.
- Seal-less design means no leaks or seals and cups to wear.
- Greatly reduced maintenance requirement, saving cost and reducing downtime.
- Breakdowns eliminated saving cost and reducing downtime.
- Hydra-Cell pump is able to run dry without damage.

Conclusion:

First Hydra-Cell G35 pump ran for 6 months with no maintenance.

Pfleiderer were so impressed with the pump's performance that they subsequently bought a further Hydra-Cell G35 for a similar application and several Hydra-Cell G-10 pumps for general duties.



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*near wood and processes to make them chipboard,
(DF, TDF, Plywood, OSB, Glue) are all engineered
in common
they held together by a resin adhesive.*



Potential Problems with Competitor Pumps

Progressing Cavity Pumps

Typical materials of construction are stainless rotor and Viton lined stator. They are costly to repair, and have a reduced life expectancy due to the low lubricity factor of the resin. "Dead" spaces within these pumps can harbour "curing" resin material. Ma

Milroyal "B" Diaphragm Metering Pumps

Hydra-Cell replaced a number of Milroyal "B" pump at the Georgia Pacific plant located in Skippers Virginia.

Milroyal pumps are larger in comparison to Hydra-Cell, more costly to repair, and are subject to premature failure if not properly flushed out. Expensive pulsation dampeners are recommended for use with these pumps.

Ball check valve are not as efficient as the Hydra-cell disc arrangement. Their operation can be impaired by particulate matter build-up on seats and within the ball chamber.

Gear Pumps

Gear pumps rely on the fluid they are pumping for cooling the bearings. (Generally bushes made of engineering plastics) Similar materials are used for the wear plates that take up thrust loads. Resins are poor lubricants and poor at heat transfer, leading to areas of heat loading and inadequate cooling.

The resins in question are thermosetting. Urea-Formaldehyde can begin to set up above 35°C . A permanent change in viscosity can occur quite quickly. Should the resin set up in the nooks and crannies that are inherent in gear pump technology, then catastrophic failure will occur at some point.

Gear pump mechanical shaft seals have close tolerances and spatial voids within the arrangement. Should the resin set up in any of these areas, increased amp draw on the electric motor, shaft seal failure or mechanical lock-up can occur.

Gear pumps cannot run dry and overall pump life is significantly less than the Hydra-Cell.

Mag-Drive Pumps

Although offering good containment, mag drive arrangements work on close internal tolerances with sliding surfaces that can cause localised heating. This heating can generate premature curing of resins, especially the fast cure varieties, creating solid particles that abrade the pump and can cause malfunction and breakdown.

In total cost of ownership, Hydra-Cell wins out every time.



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OUR OPPORTUNITY

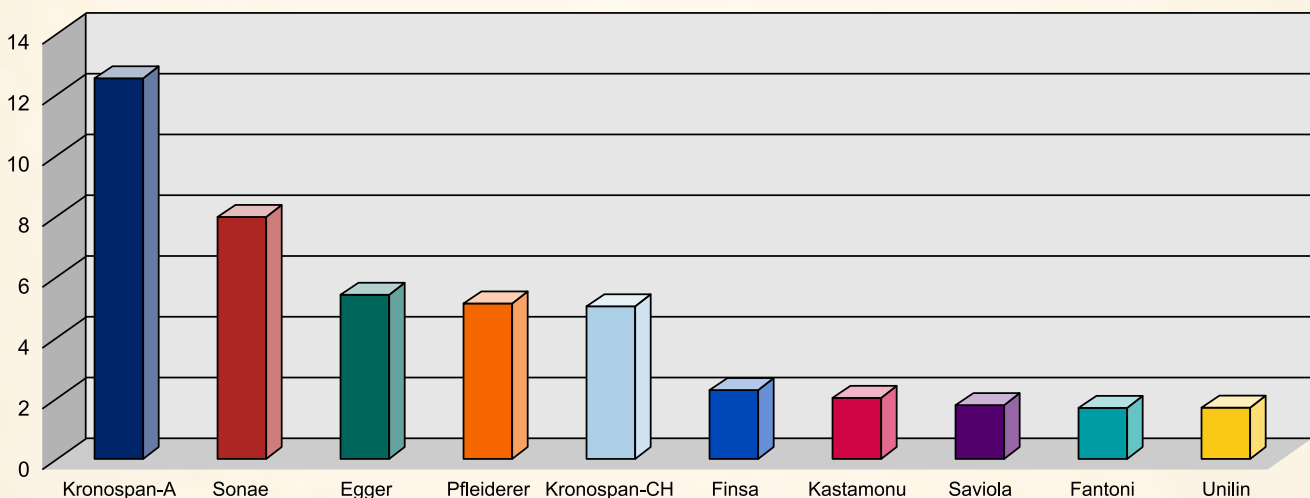
BACKGROUND

Engineered Wood, also called composite wood, man-made wood includes a range of derivative wood products which are manufactured by binding together the strands, particles, fibers, or veneers of wood, together with adhesives, to form composite materials. These materials offer performance benefits over lumber and are generally cheaper, especially when in sheet form.

THE MARKET

The market for engineered wood is massive, probably in excess of 35 million m³ per annum in Europe alone. In its many forms, engineered wood can be found in the furniture industry, building and construction throughout the world. Due to the unique performance attributes of the Hydra-Cell pump we have a significant commercial opportunity in this market and already have success in one specific application.

"Manufacture of MDF Panels in Europe (inc Serbia, Ukraine and Turkey) Millions of Tonnes"



There are many engineered woods and processes to make them. Chipboard, Particleboard, MDF, HDF, Plywood, OSB are engineered woods with one thing in common. They are held together by a resin adhesive. Although some boards use the natural resin found in the wood itself, the vast majority of grades utilise additional resins, hardeners and waxes, all of which have to be pumped... several times.

OUR OPPORTUNITY

THE RESINS

There are several types of resin adhesives that are commonly used.

Urea-formaldehyde resins (UF)

are most common, most cheap, and not waterproof.

Phenol-formaldehyde resins (PF)

are yellow/brown, and commonly used for exterior exposure products.

Melamine-formaldehyde resin (MF)

are white, heat and water resistant, and often used in exposed surfaces in more costly designs.

Methylene diphenyl diisocyanate (MDI) or polyurethane (PU)

resins are more expensive, generally waterproof, and do not contain formaldehyde.

Derived by condensation, these resins are sometimes mixed with other additives before being applied to the wood derived raw material, in order to make the final product waterproof, fireproof, insect proof, or to give it some other quality.

Where Hydra-Cell can help

The resins used are, in general, abrasive and difficult to pump. Hardened resinous adhesive particles causes premature and excessive wear of pumps with dynamic seals, (commonly gear and centrifugal types). Typically, pumps used in this application have high maintenance requirements and downtime in continuous process manufacturing is costly

A pump breakdown can be expensive in terms of pump or parts replacement but this cost may be insignificant when compared to that of downtime and lost production.

However, these resins can be pumped very effectively with seal-less Hydra-Cell pumps from Wanner.

Hydra-Cell benefits:

1. Seal-less design is not susceptible to excessive and premature wear.
2. High reliability means less unplanned maintenance and reduced downtime.
3. Lower maintenance requirements means less downtime and lower costs.
4. High efficiency from Hydra-Cell's direct displacement means lower running costs.
5. Hydra-Cell can run dry without damage



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PUMP SELECTION GUIDE 1

Viscosity

For efficient pump performance the following suction inlet/feed conditions are most important together with the operating speed of the pump –

- The suction inlet pipe must be as short and as large a diameter as possible, with no elbows, valves or filters that will restrict the flow of liquid into the pump.
- There should always exist a positive suction head.
The higher the viscosity the higher the suction head required.
In certain cases a ‘booster’ pump will be necessary to ‘force’ viscous liquids into the pump.
- Never run the pump at maximum speed, a viscous liquid will not flow easily and more time is needed to fill the pumping chambers. Approx half of the pumps max speed is typical, depending of course on the viscosity.
- Always select the X-cam for best ‘suction’ effect (longest stroke).
- Verify the suction conditions. If there is a risk of liquid starvation, a partial vacuum can result; this will affect the stability and repeatability of flow.

More inlet pressure will be necessary, or slow down the pump speed, or select next largest pump.

- A loss of flow can be expected (maybe 20-25% less typically) compared to our standard speed/flow curves for water. Due in part to the reduced closing speed of the valves against the viscous liquid.

The higher the viscosity the higher the loss; a point will eventually be reached (for a given installation) whereby further increase in pump speed does not increase the flow.

A motor with a speed control unit is ideal to optimise the speed/flow conditions.

Specific test data for all Hydra-Cell models is not yet available, and the following max viscosity values are therefore an estimation based on application experience. Considering all the above points, then very approximate guidelines per model are as follows –

Typical MAX VISCOSITIES

G03 / G04	1000cps	small dia inlet valves
G21	2000cps	G10 size inlet valves, allows direct access to pump chamber
G10	3000cps	
G15	1500cps	G10 size inlet valves, but restrictions to flow within manifold
G25	4000cps	
G35	5000cps	G25 size inlet valves, allows direct access within manifold
G40	7000cps	G40 supply special request only (no longer a standard option)

Please consult Wanner for advice on “best pump” selection in these cases.



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TOP SECRET

PUMP SELECTION

Pump material selection

						Valve assembly choices			
Liquid Chemical		Pump Head material		Diaphragm Material		Valve Springs	Spring Retainers	Valve/Valve Seat	Retainers
	Comments		Comments		Comments				
Formaldehyde (Formalin)	Can emit toxic vapours	SS 316L	Rated A to 130 Deg C	EPDM	Rated A to 50 deg C	Elgiloy	Kynar	Stainless Steel	Stainless Steel
Urea Formaldehyde (UF) (Urea Methanal)	Thermo Setting will start to set at temperatures > 35 Deg C	SS316L	Rated A to 93 Deg C	EPDM		Elgiloy	Kynar	Stainless Steel	Stainless Steel
	Urea can react with water to form Sulphuric acid								
Phenol Formaldehyde (PF)		SS 316L	Rated A to 130 Deg C	PTFE	Use E or S cams, take care with installation	Elgiloy	Kynar	Stainless Steel	Stainless Steel
Melamine Formaldehyde (MF)	Fast cure rates, temperature sensitive	Hastelloy/ Maybe Duplex SS		EPDM	Rated A to 49deg C	Hastelloy	Kynar	Hastelloy	Hastelloy
Methylene-diphenyl-diisocyanate (MDI)	Polymerises in presence of water / water vapour	SS316L		PTFE		Elgiloy	Kynar	Stainless Steel	Stainless Steel
	Leakages to air causes seal wear problems			EPDM/Viton	These may be suitable - Suggest carry out soak tests to qualify				

Notes

The materials selected above are for the highest reliability against chemical attack. If the customer has good experience with other materials. They could be considered for Hydra-Cell also.

Some Gear pump manufactures will supply Cast Iron as the liquid end material. This may be ok depending on the concentration of chemicals, or whether the customer wants a low purchase price and is happy to replace the liquid end parts on a more frequent basis than with 316 SS. If a cast Iron gear pump is not suffering chemical attack, only abrasive wear, then the Cast Iron option for Hydra-Cell should be ok.

The chemistry of the chemicals the customer is using can vary from supplier to supplier and how they react to metals plastic and elastomers. The data above is taken from engineering references books and current Hydra-Cell installations and provided in good faith. However we can not Gaurentee of warranty corrosion performance of pump materials and process chemicals used.

GLOSSARY

A Glossary of Engineered Wood Terms

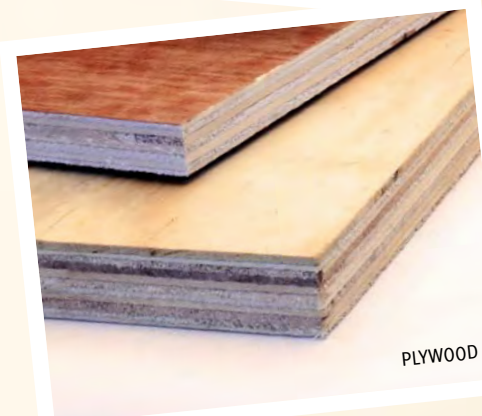
CHIPBOARD/PARTICLEBOARD

Chipboard/Particleboard is cheaper, denser and more uniform than conventional wood and plywood and is substituted for them when appearance and strength are less important than cost. Made from woodchips, sawdust, wood residues and so on, that are bound or glued together to form a flat board, chipboard/particleboard can be made more attractive by painting or faced with plastics or wood veneers that are glued onto surfaces that will be visible. Though it is denser than conventional wood, it is the lightest and weakest type of fiberboard, except for insulation board.



PLYWOOD

The original structural wood panel, plywood consists of veneers arranged in perpendicular layers. The layers may consist of a single veneer ply or two or more plies laminated with the grain running in the same direction. There are always an odd number of layers, with the grain of the face layers typically oriented parallel to the long dimension of the panel. The layers are laid up (laminated) with resin type adhesives.



OSB (ORIENTED STRAND BOARD)

OSB consists of wood strands bonded with adhesives to form a mat. Like the veneer in plywood, these mats are layered and oriented for maximum strength, stiffness and stability. The individual strands are typically up to 100mm long. OSB is widely used as construction sheathing and as the structural membranes of structural insulated panels (SIPs).



STRUCTURAL COMPOSITE PANELS

Structural composite panels consist of veneer faces bonded to a wood-base core material, such as OSB. Composite panels are manufactured in three- or five-layer arrangements. A three-layer panel has a wood fiber core and a veneer face and back, while a five-layer panel also has a veneer crossband in the center. When manufactured in a one-step pressing operation, voids in the veneers are filled automatically by the particles or strands as the panel is pressed in the bonding process. Typical composite panel applications include sheathing, siding and industrial applications.

GLOSSARY

DENSIFICATION

A chemical or physical treatment - layers are bonded together with treatment in excess of that needed to ensure a good bond - to increase hardness and improve mechanical strength or resistance to chemical or electrical agencies

LAMINBOARD/BLOCKBOARD

Thick compound board with a core that's usually made up of small timber strips, glued together at right angles and with a surface of other woods.

FIBREBOARD (LDF, MDF & HDF)

Types of fibreboard are differentiated by the size and type of wood fibres used, the method of drying, what type bonding agent is used and the method by which it is pressed into shape.

The most common, (MDF) Medium Density Fibreboard, is manufactured by a dry process at a lower temperature than for example hardboard (HDF), another type of fibreboard. The effect of this is that the natural glues and resins contained within the wood are rendered ineffective. MDF therefore uses manufactured bonding agents and resins. Varying density boards with differing finishes are used for various end uses.

WAFERBOARD

Thin wafers of wood that look like small pieces of veneer that are bonded together under heat and pressure with glue, resulting in a solid uniform panel that gives strength and water resistance. A grade in between OSB and chipboard/particleboard but sometimes, just another name for OSB.

LAMINATE FLOORING

High-density fibreboard covered in a printed paper that is then varnished. To install, some systems glue together and some simply click or slot together. Different types are designed for specific uses, for example in moist areas or areas of high traffic. Variants with real wood veneers laminated to the upper surface are increasingly common.

BLOCKBOARD



of



MDF (Medium Density Fibreboard)



LAMINATED FLOORING