



ADDITIVES TECHNOLOGY

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Structure of the presentation

- Profile of CHIMAR activities
- Framework of CHIMAR additives technology
- Additives Portfolio



CHIMAR HELLAS profile

- Developer and Provider of Industrial Technology for resins and chemicals for wood-based panels
 - Technology licensing, manufacturing support, application support for:
formaldehyde resins, resin additives, field processes
- Industrial Engineering and Plant Procurement:
formaldehyde, UFC, resins, chemical additives



CHIMAR HELLAS profile II

- Research & Development:
develops know-how in house
- Training of client
personnel
- Technical support:
remotely and on-site
- Product testing:
as per international standards



CHIMAR HELLAS features

- No frontier-global service company
- Innovative, knowledge-intensive
- Customer oriented
- Focused on providing green technologies and on fulfilling the eco-efficiency principles
- Provider of technology enhancing process productivity and profitability
- Applying modern R&D techniques and IT-tools



CHIMAR Additives Technology

- Integrated, tailor-made binder systems: resins and various additives
- Sometimes more than one or even three additives in the binder system, to satisfy both the panel production settings and the final product specifications
- Solutions for all resin and panel types



Additives Portfolio

- Hardeners
- Formaldehyde scavengers
- Resin extenders
- Fire retardants
- Additives for paper impregnation
- Recycling agents



CHIMAR Hardeners

- Resin hardeners or curing agents: they accelerate the resin polymerisation
- Hardener technologies **for all types of resins and wood panels**
- Hardeners in either solid or liquid form
- Can be used either alone or in combination with conventional hardeners



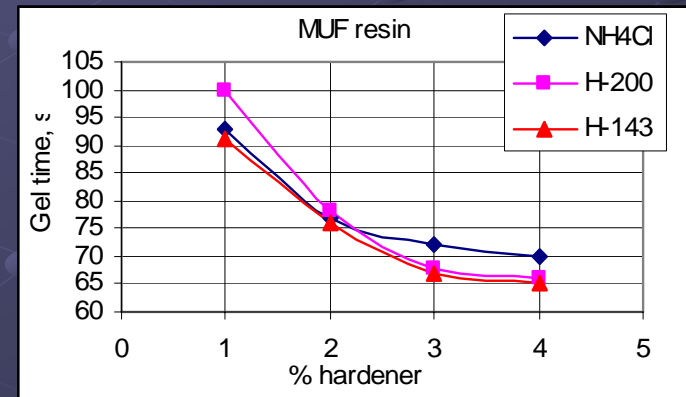
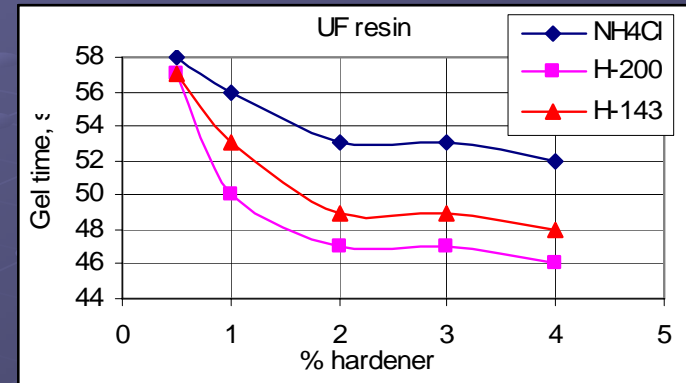
CHIMAR Hardeners: Advantages

- Their application helps to reduce the press cycle thus **increasing the productivity** by up to 20%
- The board properties are improved enabling **reduction of the resin level** and thus reduction of the production cost
- In the case of MUF resins, CHIMAR special hardeners helped to improve the panels water resistance thus allowing the reduction of melamine content and therefore **cost savings**



CHIMAR Hardeners: Examples

- Hardeners H-200 and H-143 compared with NH_4Cl in the case of UF resin
- Hardeners H-200 and H-143 compared with NH_4Cl in the case of MUF resin



CHIMAR Formaldehyde Scavengers

- CHIMAR scavengers are used to reduce the formaldehyde emissions during panel production as well as the emissions of finished panels
- Scavenger technologies for amino resin types (UF, UMF, MUF)
- Scavengers are tailor-made to satisfy the plant requirements and operating parameters (e.g. feedstocks, final product requirements)
- First scavengers were commercially introduced on a global basis by CHIMAR at the end of the 1970's
- Panels with formaldehyde emission at natural wood level were reported by CHIMAR already in 1993



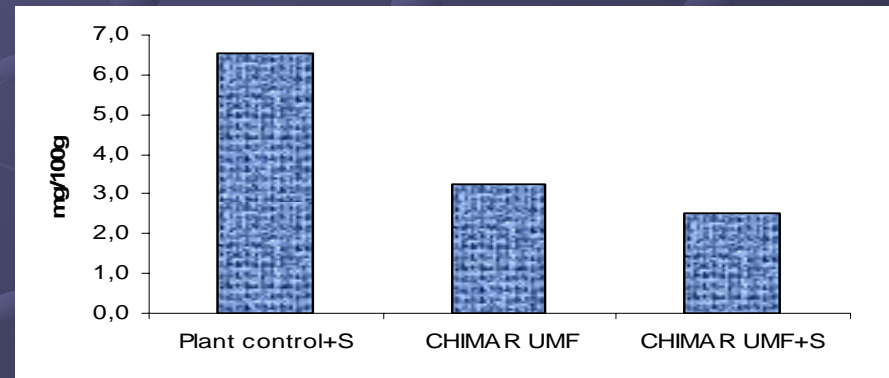
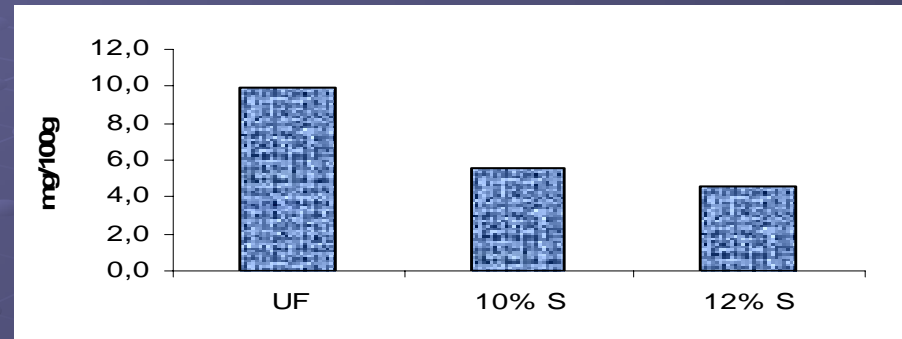
Formaldehyde Scavengers Action

- Synergistic action of CHIMAR amino resins and scavengers provides panels with desirable properties and formaldehyde emission as low as required
- Scavenger grades for achieving E1, **half E1** (EPF-S or IOS-MAT-0003), **E0** and even **SE0** (**F***** and **F******, JIS A 1460)
- Scavengers reduce formaldehyde emission permanently
- When applied, the scavengers induce **no changes in board production process**



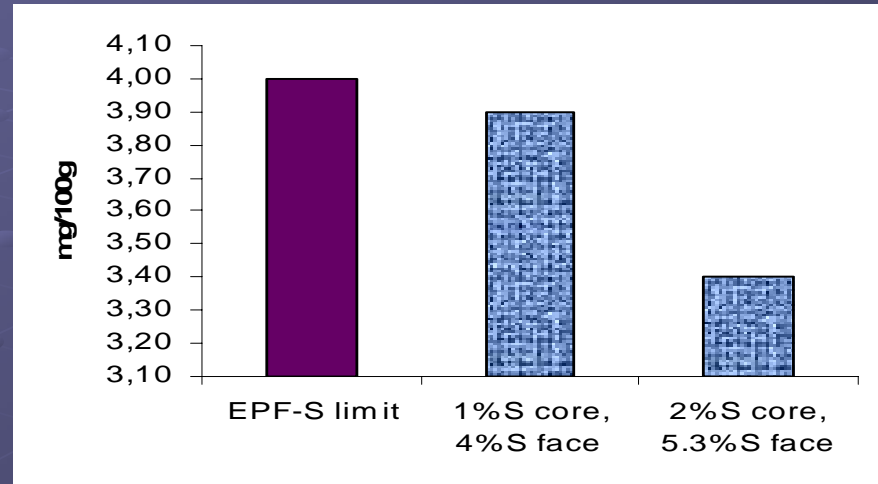
F-Scavengers Action: Examples

- Pilot **E1 MDF** in China achieved with CHIMAR low E2 UF and scavenger
- Industrial **E0 MDF** in Europe achieved with CHIMAR UMF and scavenger

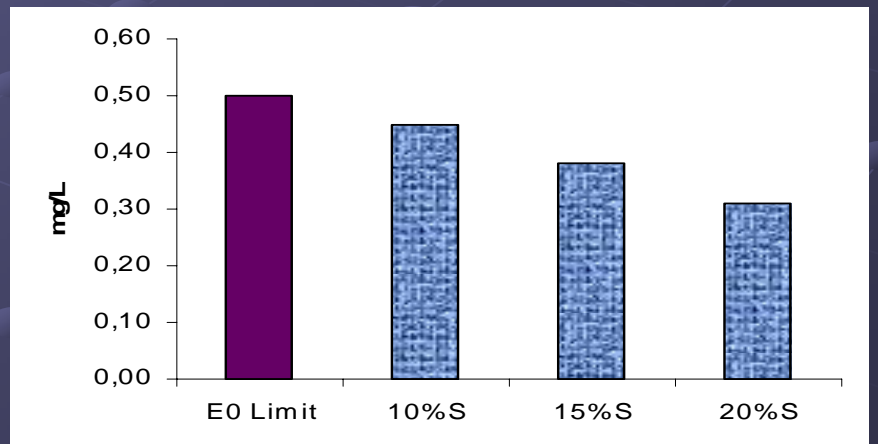


F-Scavengers Action: Examples II

- Industrial **half E1 PB** in Europe achieved with CHIMAR UMF and scavenger

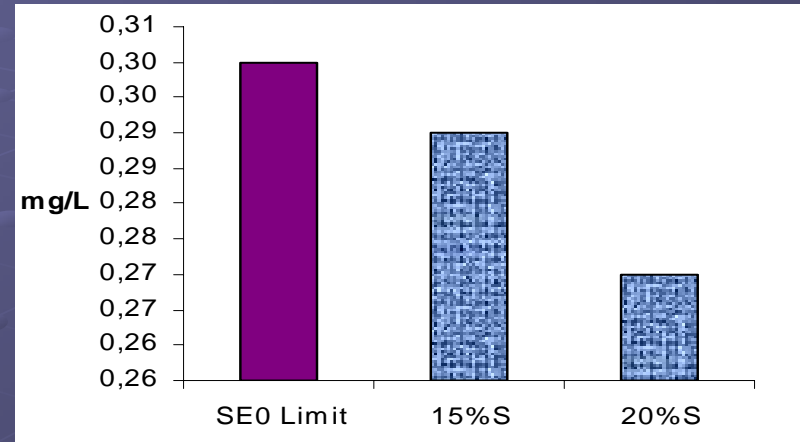


- Industrial **E0-MR thin MDF** in Oceania achieved with CHIMAR MUF and scavenger

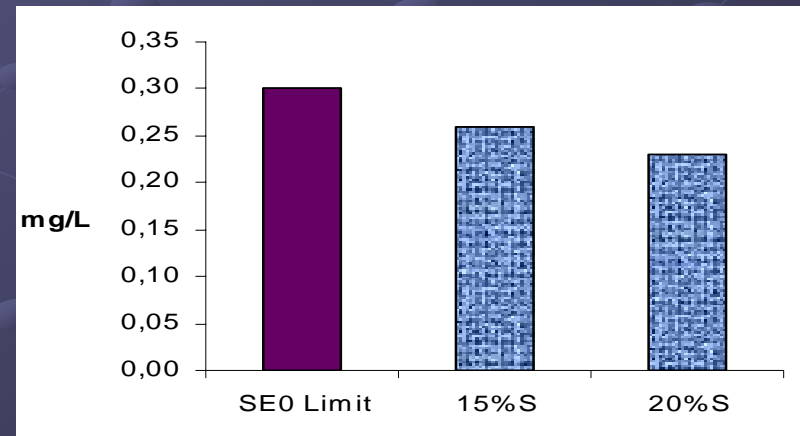


F-Scavengers Action: Examples III

- Industrial **SE0 MDF** in Oceania achieved with CHIMAR UMF and scavenger



- Industrial **SE0 thin MDF** in Oceania achieved with CHIMAR UMF and scavenger



CHIMAR Resin Extenders

- CHIMAR extenders are used to substitute part of the resin applied in panel production at no sacrifice of the panel properties, thus offering cost savings
- Extender technologies for amino and phenolic resin types
- Extenders are tailor-made to satisfy the plant requirements and operating parameters (e.g. feedstocks, final product requirements)
- First extenders were commercially introduced on a global basis by CHIMAR at the end of the 1970's



CHIMAR Extenders: Advantages

- Their application provides **up to 10% savings** on the binder cost
- When applied, the extenders induce **no changes in board production process**, therefore no additional investment is needed
- CHIMAR special grades with the **extender-scavenger dual function** are provided to reduce the process steps in board production



CHIMAR Fire Retardants

- CHIMAR provides technologies for fire retardant compositions effective in enhancing the panel fire resistance at desirable levels
- Advantages offered:
 - ❖ Non-corrosive and halogen-free products
 - ❖ High retention of properties - IB, MOR, swelling
 - ❖ No deterioration of the properties with time
 - ❖ No increase in formaldehyde emission, possible reduction of it
 - ❖ The board surface is suitable even for veneering



CHIMAR PYRO-S series

- Patent protected WO 02/102926
- Application in MDF
- In liquid form, readily added in the blowline through a nozzle
- Dosing 10-15% w/w based on dry fibres (depending on the plant operating parameters and the desired final product specifications)
- Can only be mixed with the glue in a static mixer
- Total pressing time may need to be increased up to 10% as compared to the standard MDF production



CHIMAR PYRO-SM series

- Application in PB
- In solid form
- Can be added in all board layers
- It is preferably added on the chips before the blender
- Dosing 15-20% w/w based on dry chips (depending on the plant operating parameters and the desired final product specifications)
- Use of a formaldehyde source may be needed to re-adjust the reduced formaldehyde of the system



Additives for Paper Impregnation

- CHIMAR provides technologies for the production of additives used in paper impregnation:

- ❖ Wetting agents
- ❖ Release agents
- ❖ Hardeners



Hardeners for Paper Impregnation

- Their application allows the **reduction of the hardener level** and thus reduction of the production cost
- They are easily applicable in conventional impregnation lines
- They provide impregnated paper and laminated boards with equal or even improved quality as compared to competitive hardeners



CHIMAR Recycling Process

- Patent protected WO 02/051898
- CHIMAR recycling process allows the use of **up to 20% of waste boards** (raw, laminated or veneered) in **MDF** manufacturing without deterioration of the panel mechanical properties and the production capacity
- Both in-house rejects as well as other waste panels can be recycled
- No major investments in equipment are required



CHIMAR Recycling Agents

- As part of this recycling process, a chemical composition (**recycling agent**) prepared according to CHIMAR technology is injected in the digester to promote fibre recycling
- **Cost savings** may vary from plant to plant, depending on fuel self-sufficiency and waste panel availability



CONCLUSION

It is possible to meet the challenges of the global requirements for continuous improvement of the panel performance, using the integrated binder systems (resins and additives) offered by CHIMAR





Licensing technology around the world: 31 Years Expertise in 36 Countries

Indicative references

	Hadjilucas Shelman Alfa Wood Akritas		Sapemus Chemie		Woodchem S. Africa		Duraplay
	Flakeboard		GPC Química		Poulina/Cetiba		Alto Parana
			P.G. Zimboard Products		CHH		Kronospan
			Finsa Group				



CHIMAR HELLAS S.A.

Many thanks for your attention

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