

impress **Additives**





Into the future with tradition

The name impress stands for a successful, globally-operating group that develops and manufactures trend-oriented wood-based panel decorative surfaces for the furniture and laminate flooring industries and is involved in modern interior design. The group's product portfolio includes printed decorative paper, impregnated paper, finish foil, inks and additives. In addition to creative demands, technical innovation and outstanding product quality above all play a decisive role at impress. The surface specialist is one of the world's leading companies in the industry and supplies its well-known customers around the world from its seven international production facilities.

The impress group is most convincing with its high degree of flexibility, agility and vision in making business decisions, more than 85 years of experience within the sector, profound expertise and, above all, the lasting confidence of its customers.

The basis for the impress group's enduring success is its claim of working together with partners in the market to use innovative technologies to develop design-oriented products. The company's identity is lived out in an intensive exchange of ideas along the entire value-added chain – from upstream suppliers to the company's own processes, further processing in the customer's coating process, and finally to successful positioning at the point of sale. As a result, impress is a competent development partner with integrated ties to the supply chains of their business partners.

Even during the initial years, internationalisation was the declared objective of the company founders. Today, the worldwide locations guarantee excellent service for customers, which makes them the ideal platform for a future-oriented, strategic partnership with globally-operating companies. The emphasis: for impress, the transfer of know-how, service quality, security of supply, process partnerships and a high willingness to invest mean an intensive focus on future technologies and guaranty the production of high quality products.

At impress, product development – with regards to print structure and surface finish and the utilisation quality of the finished product – is one of the essential process steps with a partnership-based customer approach and a direct exchange of competencies. An internationally positioned team of experts with an outstanding network of contacts analyses global trends in design and surface technology and – in collaboration with local customers – develops wood, stone and fantasy decors with future-oriented performance properties, which reflect the diverse cultures and requirements of the respective regions.

Throughout the history of impress, the group has always critically analysed and validated the status quo. The continuous improvement process (CIP) is an essential part of the company's philosophy, which is applied to both internal processes and to the interfaces to upstream suppliers and customers. This has resulted in new ways of thinking and structures that sustainably enrich the corporate culture and ensure that the company is able to self-confidently look towards the future of the dynamic market of wood-based panel decorative surfaces.



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→ Introducing **impress Additives**

impress has many years of experience in the production of impregnated decorative paper and possesses “the know-how” regarding all important quality factors in the field of paper impregnation and lamination.

Succinctly, this expertise covers the following:

- Production of quality melamine and urea formaldehyde resins
- Development of new resin additives and their scale-up for implementation in production
- Application of an extensive range of impress additives that address the needs of paper impregnators
- Production of resin additives – to a high quality standard whilst still being economical
- Formulation of tailored impregnation recipes for specific paper types - blending MF and UF resins, together with additives for an optimized impregnation and pressed surface finish
- Adjustment and optimization of impregnation line settings - impress operates 9 impregnation lines
- Adjustment and optimization of lamination processes - such as “shortcycle” and high pressure “day light” press settings
- Extensive experience with global customers - including an awareness of how local or environmental factors can influence impregnation and lamination processes, and what necessary measures need to be employed

Other advantages that impress can offer are:

- The additives are the same as those used in current impress paper impregnation formulations – i.e. implementation of “best practice”
- Prompt delivery of additives
- Service and Technology consultation:
 - Optimization of impregnation process facilities and practices
 - Preparation of resin formulations
 - Training of personnel in the areas of production and laboratory testing

ADDITIVE TYPE	PRODUCT	DESCRIPTION
01 RESIN HARDENERS		
1.1 UF Resin Hardeners	impress-UH-520	Urea Resin Hardener
	impress-UH-550	Urea Resin Hardener
1.2 Resin Hardeners	impress-MH-510	Melamine Resin Hardener
	impress-MH-530	Latent Melamine Resin Hardener
	impress-MH-531	Latent Melamine Resin Hardener
02 RESIN STABILIZERS		
Resin Stabilizers	impress-US-610	Urea Resin Stabilizer
03 RESIN MODIFIERS AND EXTENDERS		
3.1 Modifiers	impress-MM-210	Melamine Resin Modifier
3.2 Extenders	impress-MX-250	Melamine Resin Extender
04 WETTING/SEPARATING AGENTS		
Wetting/Separating Agents	impress-WA-410	Wetting Agent
	impress-WS-460	Wetting/Separating Agent
	impress-SA-900	Separating Agent
05 PIGMENT DISPERSIONS		
Pigment Dispersions	impress-PD-310	Pigment Dispersion
	impress-PD-320	Pigment Dispersion
06 ANTIFOAM SOLUTION		
Antifoam Solution	impress-AF-720	Antifoam Solution

01

→ impress Resin Hardeners

Characteristics

impress has a range of aqueous resin hardener solutions, which can provide today's paper impregnator with a fine level of control over the resin's cure profile – whether for melamine formaldehyde (MF), urea formaldehyde (UF), or mixed melamine urea formaldehyde (MUF) resins.

The range includes both traditional “tried, tested and proven” catalyst technologies, and those resulting from new innovation, research and development projects - unique to impress.

Advantages

- Quality – impress has strict production and quality control procedures that ensure reproducible batch to batch catalytic activation and activity of each hardener type
- Control over the resin's cure time and cure profile:
 - The hardeners are activated at high temperatures
 - Each specific hardener has its own unique temperature range, wherein it is activated to catalyse resin polymerisation and cure
- Catalytic action can be triggered as required:
 - Partly and to a chosen degree within the impregnation line dryers
 - Completely within the laminate production press cycle
 - Almost exclusively and completely within the laminate production press cycle
- Improved shelf life of impregnated paper
- impress hardeners are suitable for Short-Cycle and Day-Light press systems
- Leaves no press plate deposits
- Water dilutable
- Compatibility with all other impress additives

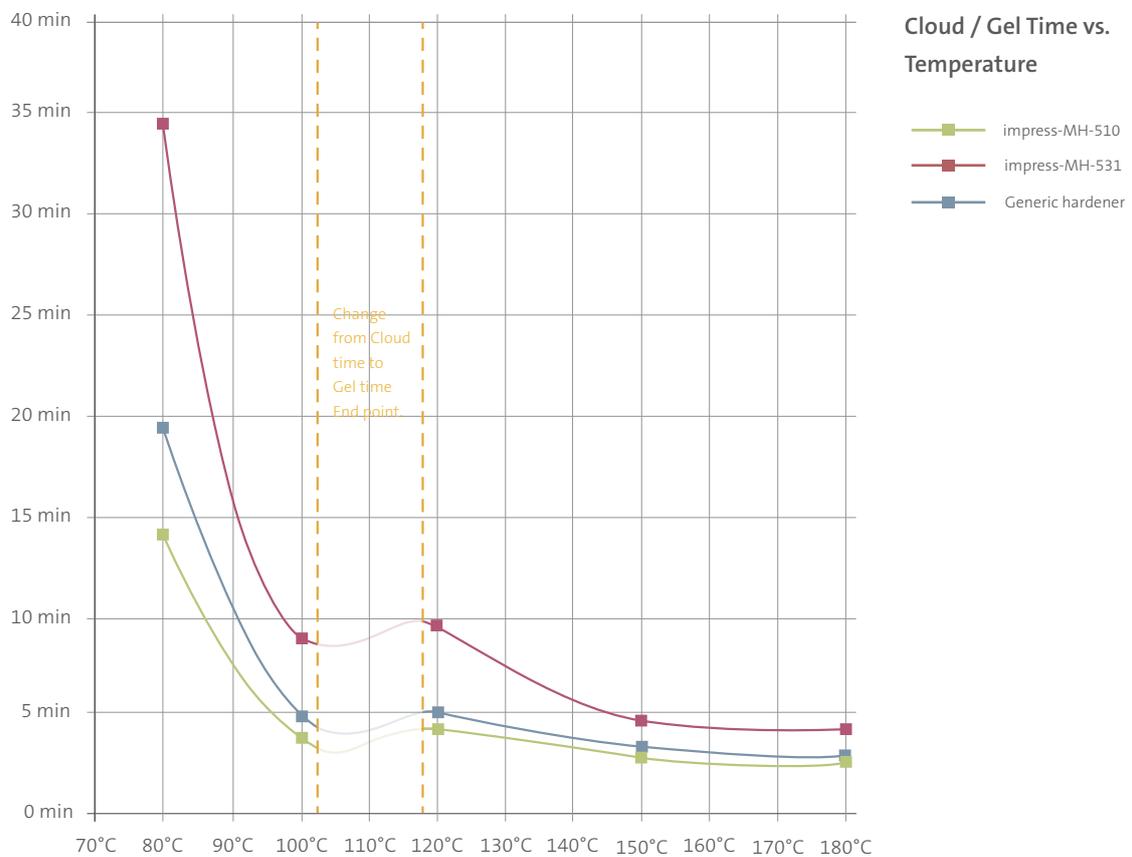
ADDITIVE TYPE	PRODUCT	DESCRIPTION
01 RESIN HARDENERS		
1.1 UF Resin Hardeners	impress-UH-520	Urea Resin Hardener
	impress-UH-550	Urea Resin Hardener
1.2 Resin Hardeners	impress-MH-510	Melamine Resin Hardener
	impress-MH-530	Latent Melamine Resin Hardener
	impress-MH-531	Latent Melamine Resin Hardener

Application

The hardeners are typically dosed in the range of 0.1-1.0% (based on weight) and should be homogeneously mixed into the resin formulation at ambient temperature. They are all well-suited for optional formulation with the resin stabilizer impress-US-610.



Diagram of curing profiles: Resin hardening with a standard dosage (Temperature vs Time); cloud times / gel times are plotted for impress-MH-510, impress-MH-531 and a generic hardener.



02

→ impress Resin Stabilizers

Characteristics

impress has an all-purpose resin stabilizer, which can be used to arrest reactions and the gradual increase in oligomer molecular weight at room temperature; thus providing a longer pot-life. This leads to practical advantages in the impregnation of paper and minimises the wastage of resin formulations that are deemed to be too old for use.

It is tailored for use with Urea Formaldehyde (UF) resin, and typical resin formulations for the first impregnation of decorative paper in two-step impregnation processes. It can be used with all types of amino resin.

Advantages

- Significantly retards reaction between resin oligomers at room-temperature:
 - Stabilized resin formulation pH
 - Extended pot-life of a UF impregnation recipe
 - Minimisation of hardened residues on the impregnation line and easier cleaning
 - Consistency – The batch of formulated resin retains the same properties throughout the impregnation
- It is a water based solution of amine compounds and fully compatible with all other impress additives
- Can be used to control the resin's cure time and cure profile
- It can extend the shelf life of impregnated papers
- Chemical bonding to the resin:
 - During drying it is partially bonded to the resin
 - On pressing it is fully incorporated into the resin
 - It is not detrimental to a cured resin's hardness

ADDITIVE TYPE	PRODUCT	DESCRIPTION
02 RESIN STABILIZERS		
Resin Stabilizers	impress-US-610	Urea Resin Stabilizer

Application

The stabilizer is typically dosed in the range of 0.1-1.0% based on weight. It should be homogeneously mixed into the resin formulation at ambient temperature, preferably before the addition of hardener.



1 UF impregnation formulation without stabilizer (24hrs old).

2 UF impregnation formulation with stabilizer (24hrs old).

03

→ impress Resin Modifiers (3.1)

Characteristics

impress has a general all-purpose resin modifier, which can be used to significantly improve a resins properties and provide a number of benefits. It can be used for the modification of all amino resins, though it is primarily designed for use with melamine formaldehyde (MF) and melamine urea formaldehyde (MUF) resins.

Advantages

- Reduces cracking – the resin is less brittle and resists thermal shock
- Resistance against steam – indicates a general resistance to moisture which is vitally important to the practical application of laminated products
- Resistance against heat damage e.g. from hot pots and pans
- Better reproduction of structured patterns e.g. wood grain
- Unlike many other plasticizers, the entire modifier will be incorporated into the hardened resin through chemical bonding. This is better for the environment and also better for the work place (e.g. no emissions issues regarding the dryers or lamination presses)
- Does not adversely affect appearance properties e.g. gloss

By improving a resin's flow properties, it is possible to reduce the porosity and the cracking of decorative laminated fibre/particleboard during heating/cooling processes; both in production (e.g. short cycle pressing) and in the practical usage of the product (e.g. a kitchen work top's resistance to damage from hot pots and pans).

ADDITIVE TYPE	PRODUCT	DESCRIPTION
03 RESIN MODIFIERS AND EXTENDERS		
3.1 Modifiers	impress-MM-210	Melamine Resin Modifier

Application

The modifier is typically dosed in the range of 1.0-5.0% (based on weight) and should be homogeneously mixed into the resin formulation at ambient temperature.

Please note that other additive components are best added after the modifier.



Laminate produced with impress-MO-210.
No heat tearing.



Laminate produced without a resin modifier.
Product can suffer from heat tearing.

Both boards were subjected to a heat stress test and then allowed to cool to room temperature before being evaluated

03

→ impress Resin Extenders (3.2)

Characteristics

impress has a resin extender, which can be used to reduce the amount of melamine required by any particular MF or MF/UF resin, without any significant change to the properties. It therefore can offer the impregnator a significant saving in terms of raw material cost.

Advantages

- Reduction in melamine formaldehyde resin consumption
- Overall reduction in raw material costs
- Environmentally friendly:
 - It is sourced from renewables
 - Will present no issues with respect to dryer exhaust emissions, emissions on pressing, or in the burning of waste paper or laminates

ADDITIVE TYPE	PRODUCT	DESCRIPTION
03 RESIN MODIFIERS AND EXTENDERS		
3.2 Extenders	impress-MX-250	Melamine Resin Extender

Application

The amount of extender used in the resin has to be determined in a technology project.



04

→ impress Wetting/Separating Agents

Characteristics

impress has formulated a group of highly effective wetting and separating agents, with properties that complement one another - offering today's paper impregnator the possibility to formulate recipes tailored to various paper types.

A wetting agent can modify a resin formulation's surface tension properties. This can aid impregnation in two ways:

1. Resin Penetration: It is important that the first impregnation recipe, rapidly and completely penetrates the dry paper. Therefore it can be considered that with a more rapid resin penetration, an increase in line speed is possible and consequently an increase in productivity too.

2. Self-Levelling: Modification of the resin's physical-chemical properties by addition of an additive allows it to be self-levelling. Thus a fine degree of smoothness and evenness is achievable that goes beyond those provided by mechanical means alone.

A separating agent will alter the surface properties of the impregnated paper. Primarily it will avoid sticking to the metal press plate during pressing. Consequently shorter cycle press times can be achieved, and cleaning downtime reduced.

Advantages

impress-WA-410 | Wetting Agent

This is ideal for the "first" or "core" impregnation of decorative paper:

- Superior and rapid wetting of dry paper
- Concentrated and highly effective
- Low Volatile Organic Compounds (VOC) content – does not create issues with contaminated exhaust air from the dryers
- Free from alkylated phenol compounds, such as nonyl-phenol
- Good smoothing / self-levelling of the resin on the paper
- Good stability in the resin formulation
- Typically used for UF and MUF formulations

impress-WS-460 | Wetting/Separating Agent

This is optimized for the "second" paper impregnation step:

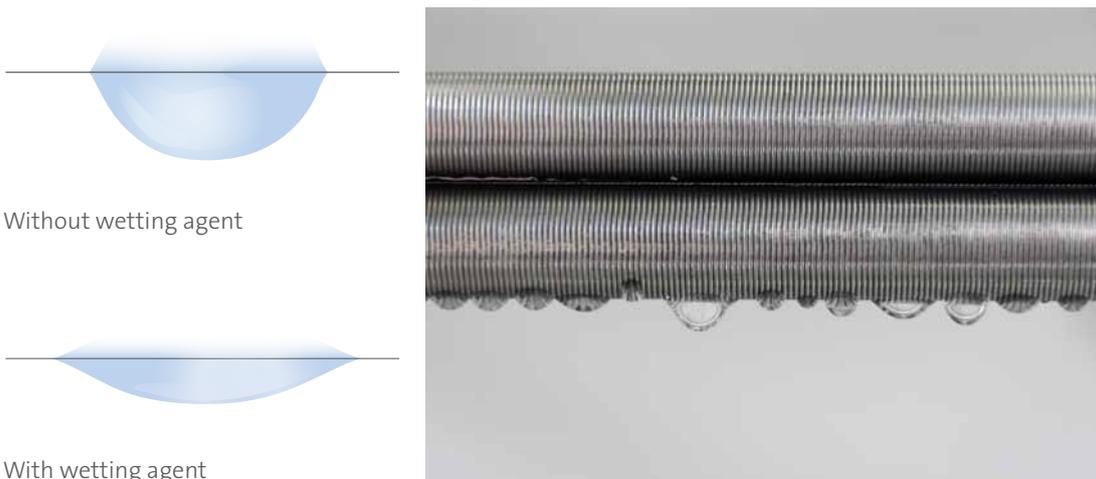
- Benefits to the 2nd impregnation recipe:
 - Reduced surface tension – better wetting of the paper, and self-levelling of the resin surface
 - Low Volatile Organic Compounds (VOC) content – does not create issues with contaminated exhaust air from the dryers
 - Good stability in the resin formulation

- Benefits to the impregnated paper:
 - It acts as a separating agent, significantly reducing sticking to the press plate
- Concentrated and highly effective
- Free from alkylated phenol compounds, such as nonyl-phenol
- Typically used for MF and MUF formulations

impress-SA-900 | Separating Agent

impress's standard all-purpose separating agent:

- Reduces sticking to the press plate and increased productivity at the press
- Concentrated and highly effective
- Free from alkylated phenol compounds, such as nonyl-phenol
- Typically used for MF and MUF formulations



ADDITIVE TYPE	PRODUCT	DESCRIPTION
04 WETTING/SEPARATING AGENTS		
Wetting/Separating Agents	impress-WA-410	Wetting Agent
	impress-WS-460	Wetting/Separating Agent
	impress-SA-900	Separating Agent

Application

These wetting/separating agents should be homogeneously mixed into the resin formulation at ambient temperature. The amounts used in a resin formulation have to be determined in a technology project.

05

→ impress Pigment Dispersions

Characteristics

The impress pigment dispersions are predominately TiO₂ (titanium dioxide) based and are used to increase the opacity and covering capacity of white impregnated paper.

Generally they are used in two-step impregnation processes; normally being utilised in the second impregnation recipe, but they can if required be used in the first impregnation. They are suitable for use with all application devices.

Advantages

The impress pigment dispersions possess the following features that can benefit the formulation of a pigmented resin:

- High rutile titanium dioxide content – this mineral possesses the highest known refractive index of any known substance, and so provides a high quality coverage and dense even opacity
- Low viscosity – addition of the pigments should not cause a significant or adverse increase in a resin formulation's viscosity
- Low VOC (Volatile Organic Compound) content – therefore no issue with emissions from the impregnation dryers
- Good colloidal stability – for a typical resin formulation
Some light-moderate stirring is always recommended though
- Pigmentation with Levelling Effect – When combined with FNT 410, the pigmented resin formulation will have good self-levelling properties regarding the surface film, resulting in an even better appearance

ADDITIVE TYPE	PRODUCT	DESCRIPTION
05 PIGMENT DISPERSIONS		
Pigment Dispersions	impress-PD-310	Pigment Dispersion 50% solid content
	impress-PD-320	Pigment Dispersion 70% solid content

Application

The dispersions should be added to a resin formulation at ambient temperature. It is recommended that with automatic dosing and mixing units that a separate dedicated weigh scale is used for the pigmented dispersions. The order of component mixing is not critical.



06

→ impress Antifoam Solutions

Characteristics

In case of foaming, a small charge of impress-AF-720 antifoam agent solution provides an easily applied, effective and practical countermeasure to the issue.

The diagram below shows the antifoaming properties of impress-AF-720 both in terms of reducing the amount of foam generated and in the speed of its collapse.

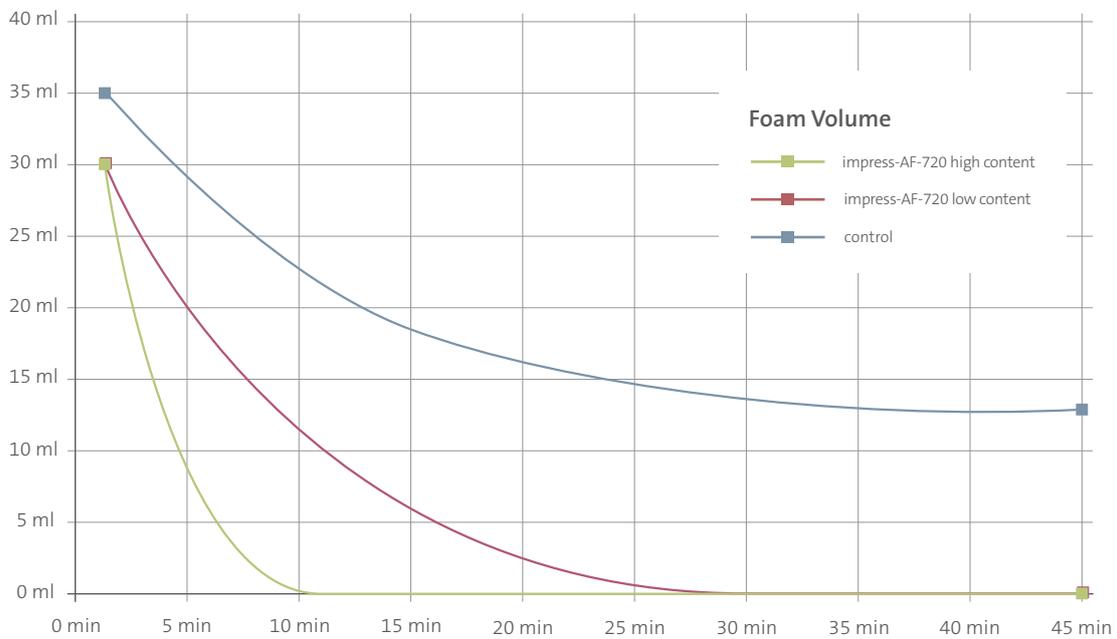


Diagram of Antifoam Effect: A resin is foamed with compressed air and the volume of resultant foam is plotted against time. The resin with Antifoam agent has a reduced volume of foam and it breaks down more quickly.



ADDITIVE TYPE	PRODUCT	DESCRIPTION
06 ANTIFOAM SOLUTION		
Antifoam Solution	impress-AF-720	Antifoam Solution

Application

The antifoam agent is typically used in range 0.01- 0.30% (based on weight). The antifoam agent should be homogeneously mixed into the resin formulation at ambient temperature shortly before use.

→ impress Delivery Form

All impress additives are liquid and can be delivered in the following units.

ADDITIVE TYPE	PRODUCT	DESCRIPTION	200 Ltr Plastic Barrels	1tonne IBCs
01 RESIN HARDENERS				
1.1 UF Resin Hardeners	impress-UH-520	Urea Resin Hardener	•	•
	impress-UH-550	Urea Resin Hardener	•	•
1.2 Resin Hardeners	impress-MH-510	Melamine Resin Hardener	•	•
	impress-MH-530	Latent Melamine Resin Hardener	•	•
	impress-MH-531	Latent Melamine Resin Hardener	•	•
02 RESIN STABILIZERS				
Resin Stabilizers	impress-US-610	Urea Resin Stabilizer	•	•
03 RESIN MODIFIERS AND EXTENDERS				
3.1 Modifiers	impress-MM-210	Melamine Resin Modifier		•
3.2 Extenders	impress-MX-250	Melamine Resin Extender	•	•
04 WETTING/SEPARATING AGENTS				
Wetting/Separating Agents	impress-WA-410	Wetting Agent	•	•
	impress-WS-460	Wetting/Separating Agent	•	•
	impress-SA-900	Separating Agent	•	•
05 PIGMENT DISPERSIONS				
Pigment Dispersions	impress-PD-310	Pigment Dispersion		•
	impress-PD-320	Pigment Dispersion		•
06 ANTIFOAM SOLUTION				
Antifoam Solution	impress-AF-720	Antifoam Solution	•	•

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