Project co-funded by the European Commission within the FP7 (2007–2013)

Grant agreement no.: 308630

I-PAN

INNOVATIVE POPLAR LOW DENSITY STRUCTURAL PANEL

Project type: Collaborative Project

Start date of project: 1st October 2012 Duration: 36 months

D4.3 – Handling, metering analysis and implementation

WP n° and title	WP4 – Definition of technologies for strand production, handling and metering
WP leader	IDP
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Planned delivery date	M24 (September 2014) Start on M7
Actual delivery date	M24 (September 2014)
Reporting period	RP2

Dissemination Level		
PU	Public	
PP	Restricted to other programme participants (including the Commission Services)	X
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Document information

Abstract

A suitable technology will be studied and developed for handling and metering the strand in this task: Report on the innovative solutions that will not damage the strands and minimize blade wear.

Keywords

Strand, blades, rotors, inclination, speed

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Peer Reviewers	IMAL

Document history

Version	Date	Reviewed paragraphs	Short description
0.1	*10/07/2014*	*all*	*First draft*
0.2	*20/09/2014*	*all*	*Second draft*
0.3	*25/09/2014*	*all*	*Release for peer review*
1.0	*30/09/2014*	*all*	*Final version for the EC*

* Abbreviations of editor/contributor name

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INTRODUCTION

In this task, a suitable technology will be studied and developed of equipment utilized for mat forming, from the target density (about 420-440 Kg/m3) without foregoing panel strength, a very slim strand will be needed (80-100 mm long, 5-10 mm wide and 0.2-0.5 mm thick) and with an acceptable standard deviation. Strander technology today can reach a minimum thickness of 0.7 mm with a high standard deviation, leading to a large amount of chips and fines that are detrimental to the final quality.

R&D activities will define a new technology to feed logs into the strander and keep them firmly locked during the stranding operation. New blades will be defined to reduce the sharpening interval, optimizing cutting angles and speed at the same time. Handling and metering analyses will also be conducted to overcome the damage to slim strands with current technologies. In this respect, a new handling and metering system will be assessed and defined, and it will be aimed at eliminating the generation of fine particles.

1 STRAND HANDLING TECHNOLOGIES

In the present task, IDP will research innovative solutions, that will eliminate the cutting disk for discharge by designing and developing special belt conveyors. The aim will be to provide a system that will not damage the strands and that will minimize blade wear. The belt conveyor developed in this task will be specially designed for processing slim strands. The belt conveyor will be equipped with a control system to consent the handling, selection and storage of the strands for further processing (e.g. blending process).

The conveying process between the various pieces of equipment must provide the following benefits:

1. Maintain the “best practices” of the conveying systems currently in use [speed, reliability (running 24 hours a day] and affordability]
2. They must not ruin the strand
3. Maintain the original orientation of the strand deriving from its arrangement on the conveying belt

The first benefit derives from the expertise acquired by IDP on the market and is easily managed as the information is readily available from the market and can be conveyed to IMAL for the relative implementation, bearing in mind the innovations introduced by IMAL for the dry bin as the disks have been removed, and a variable speed, slow moving, conveying system has been designed to protect the flake.

The second benefit is accomplished through the design of a conveying system which attenuates strand fall and which, by adjusting speed, is capable of maintaining the original shape and size of the strand

The third benefit is accomplished through the activation of specific provisions at certain points of the conveying line to overcome some criticalities along the route.

2 HANDLING ANALYSIS AND SOLUTIONS

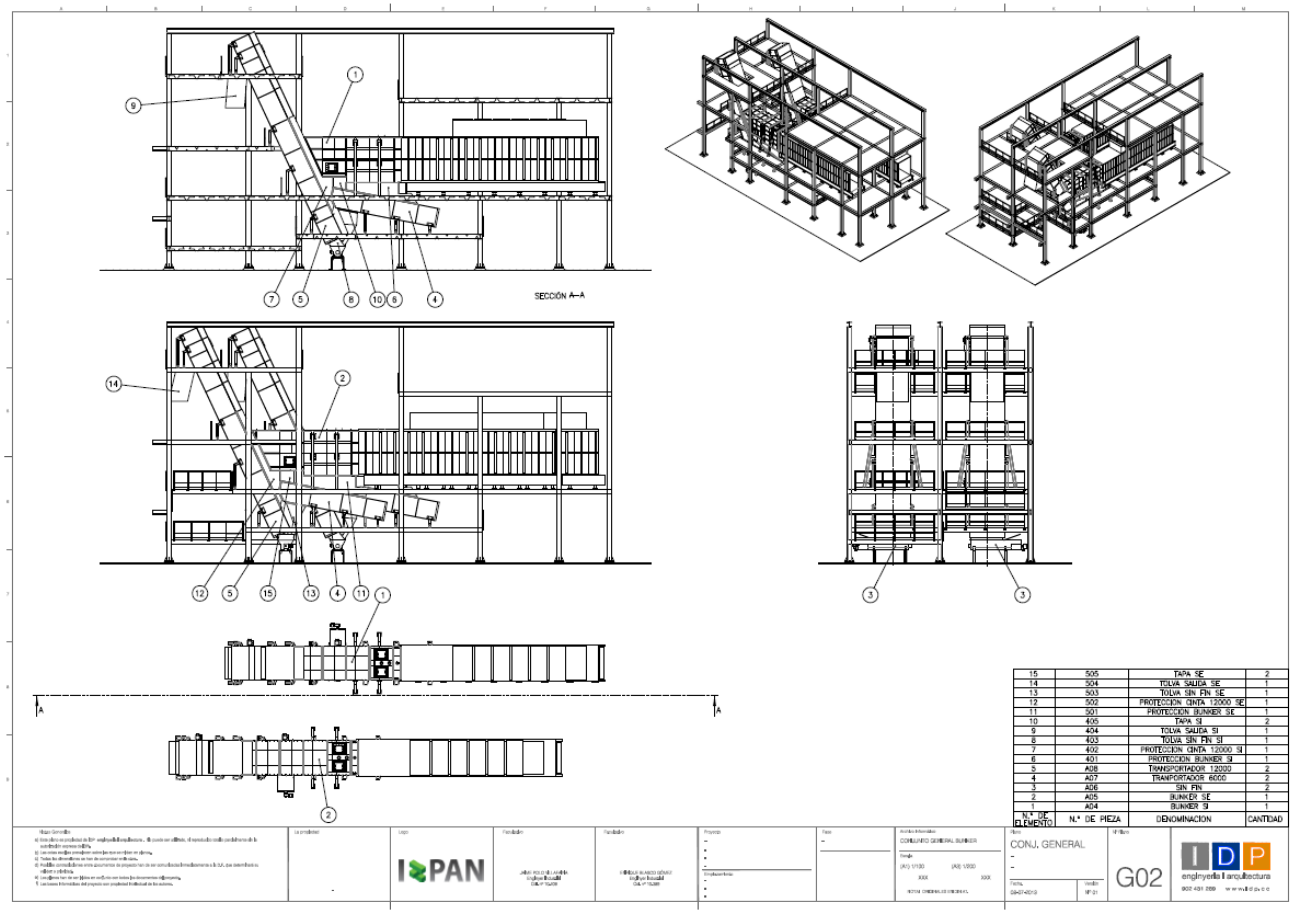
The various solutions adopted in the I-PAN project [roll dryer], dry bin [without the cutting disks (conveying)] and those introduced to the conveying process from the bin to the blending area, ensure that the flakes maintain their original form from the initial production stages.

The activity highlighted in Fig. 0 - General lay out – has been analysed closely through the detailed engineering of the single items, - approximately 30 drawings – and discussed with IMAL and IBL to share the technical choices related to the conveying systems.

The techniques introduced to prevent flake damage may be summed up as follows:

- Management of a slow constant speed, sufficient to meet the volumes required
- Technical measures at the critical points along the conveying route [bends, initial ascending steps,…] to prevent the flakes from breaking
- Sizing of the conveyor loading pallets to prevent the flakes from being damaged

Fig.0 general overview of lay out :



Nº DE ELEMENTO	Nº DE PIEZA	DENOMINACION	CANTIDAD
15	505	TAPA SE	2
14	504	TOLVA SALIDA SE	1
13	503	TOLVA SIN FIN SE	1
12	502	PROTECCION CINTA 12000 SE	1
11	501	PROTECCION BUNKER SE	1
10	405	TAPA SI	2
9	404	TOLVA SALIDA SI	1
8	403	TOLVA SIN FIN SI	1
7	402	PROTECCION CINTA 12000 SI	1
6	401	PROTECCION BUNKER SI	1
5	A08	TRANSPORTADOR 12000	2
4	A07	TRANSPORTADOR 6000	2
3	A06	SIN FIN	2
2	A05	BUNKER SE	1
1	A04	BUNKER SI	1

3 METERING ANALYSIS AND SOLUTIONS

The evaluation of the conveying quality is normally conducted visually by the cameras monitoring the conveying line and by the system monitoring flake orientation in the later stages of the work process.

The provisions applied and the solutions indicated earlier [speed, technical solutions] ensure that the flakes remain integral as they are conveyed through the process, and to assess flake quality through imaging systems.

The information provided by the imaging systems mounted at various points along the process permit intervention in the event of anomalous situations and to assess the conformity of the strand with the characteristics defined at the beginning of the project and to monitor strand orientation to produce a board with optimal properties.

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4 IMPLEMENTATION OF TECHNOLOGY

We can therefore conclude by saying that through the utilization of the technology already available and with the introduction of new technical solutions related to flake conveying, a system may be designed to reach the project targets set.

5 CONCLUSIONS

The solutions adopted, based on both theory and experience, have enabled the OSB and LSB panel production facility to produce a panel with flakes that are mostly whole and of the dimensions indicated in the project. This latter aspect, especially in terms of thickness, has also led to an improvement in the quality of the panel produced.