

# European Adhesive Bonder - A targeted training for Portuguese professionals harmonized with European directives

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## Introduction

Adhesive bonding is increasingly being used in industrial applications mainly due to its adaptability and ability to reliably join a wide range of materials and numerous industrial sectors have now adopted adhesive bonding as a key manufacturing technology, with the automotive industry being the leader in adhesive usage. This is a key sector for the European Union (climate and energy policy, which has established a target of improving energy efficiency in the European Union by 20% by 2020. Consequently, this industry is constantly demanding lighter, stronger, more durable and more environmentally friendly materials [1].

The increasing popularity of this technology is linked to the noteworthy benefits related with its application, compared to traditional joining process, such as welding or mechanical fastening process. With the increasing popularity of such joining techniques comes the necessity to train qualified professionals. The European Welding Federation developed a harmonized qualification system, which divides the training process into 3 levels: European Adhesive Bonder, Specialist and Engineer.

Currently, in Portugal, the first level of training, corresponding to EAB is already in operation. The EAB level is accredited by the EWF and therefore meets the requirements of EWF-515r1-10 and EWF-515r2-19 to which the FEUP is bound as a result of the accreditation as an Authorized Training Body [2,3].

This training is targeted for professionals using adhesive bonding technology and professionals who do not currently use this technology but want to use it, and as such has a strong practical component.

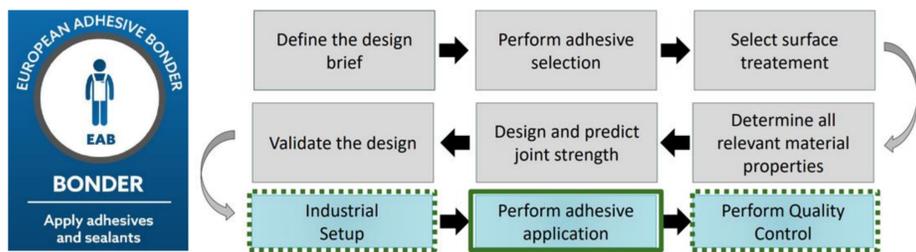


Figure 1 - European Adhesive Bonder's (EAB) Role in Industry

## Course content and schedule

EAB is who cleans and prepares the surface of the substrates, applies adhesive and/or sealant according to previously established procedure or work instructions.

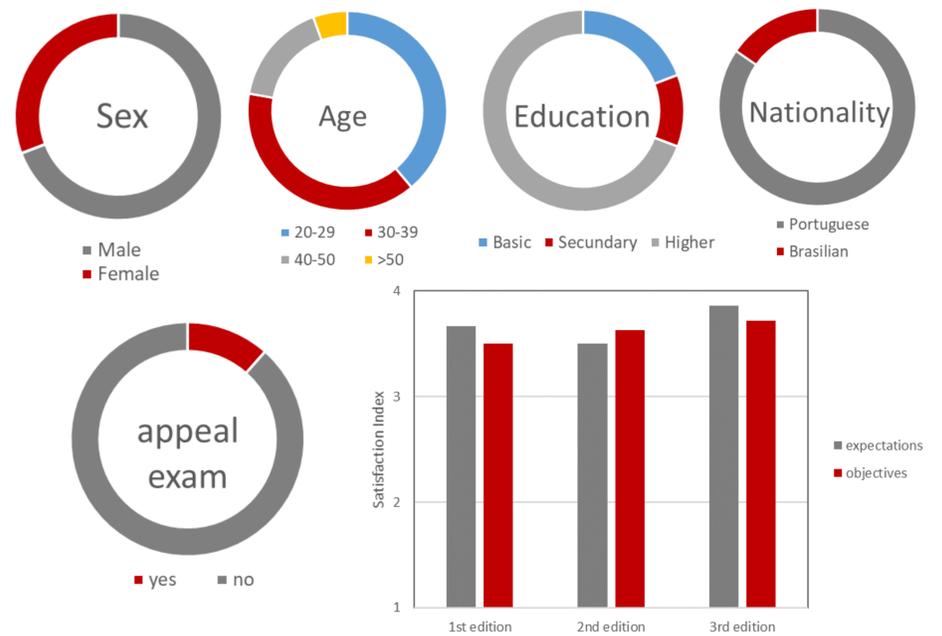
Component	Program content	Duration (hours)	
		EFW-515r1-10	EFW-515r2-19
Theoretical	Fundamentals of adhesives and adhesion	1	1
	Surface preparation before adhesive bonding	4	4
	The main families of adhesives and sealants	3	10
	Design and construction of adhesive joints	1	0.5
	Quality control of bonded structures	3	1
	Durability of adhesively bonded joints	1	0.5
	Benefits and limitations of adhesive bonding technology	2	1
	Health and safety	1	1
Practical	Practical Skills Training	18	15
Final exam	Theoretical Part		1
	Practical Part	Minimum 15 minutes	
	Oral evaluation	4h45	
Total		40	

Admission to the final exam is restricted to trainees who attend at least 90% of the course. To pass the final exam, trainees must obtain a minimum score of 60% in each component of the exam.

Final mark = 0.3\* Written Component + 0.3\* Oral Component + 0.4\* Practice Component

## Students outcome

The EAB course, began in Portugal in 2016, has already had three editions, with a total of 26 trainees. Using the data provided by the trainees, an analysis was performed, correlating age, gender, education and work position with the results obtained in the exam. An index of student satisfaction was also made using an anonymous questionnaire.



It was observed that most of the trainees who enrolled in these editions, due to their academic degree and position in the workplace, were qualified for a training course with a higher knowledge character, such as Specialist and Engineer. However, in Portugal these courses are not yet available.

## Conclusions

The following conclusions can be drawn:

- The three sessions taught in Portugal were certified by the EWF, are in accordance with the prevailing guidelines.
- The course had high approval rates and met most of the expectations and objectives set for this training.
- The population sample of this training follows labour market trends. Most of them are male, with higher education level, aged 30-35 and hold middle management positions in an industrial environment.
- The EAB have a critical spirit regarding the manufacture process of adhesive joints and at the end of the training were found to be more capable and with the adequate knowledge to perform their tasks.

## References

- Da Silva, L. F., Öchsner, A., & Adams, R. D. (Eds.). (2018). Handbook of adhesion technology. Springer Science & Business Media. 2<sup>nd</sup> Edition
- EFW, Guideline 515r1-10, European Adhesive Bonder (2010)
- EFW, Guideline 515r2-19, European Adhesive Bonder (2019)

## Acknowledgements

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