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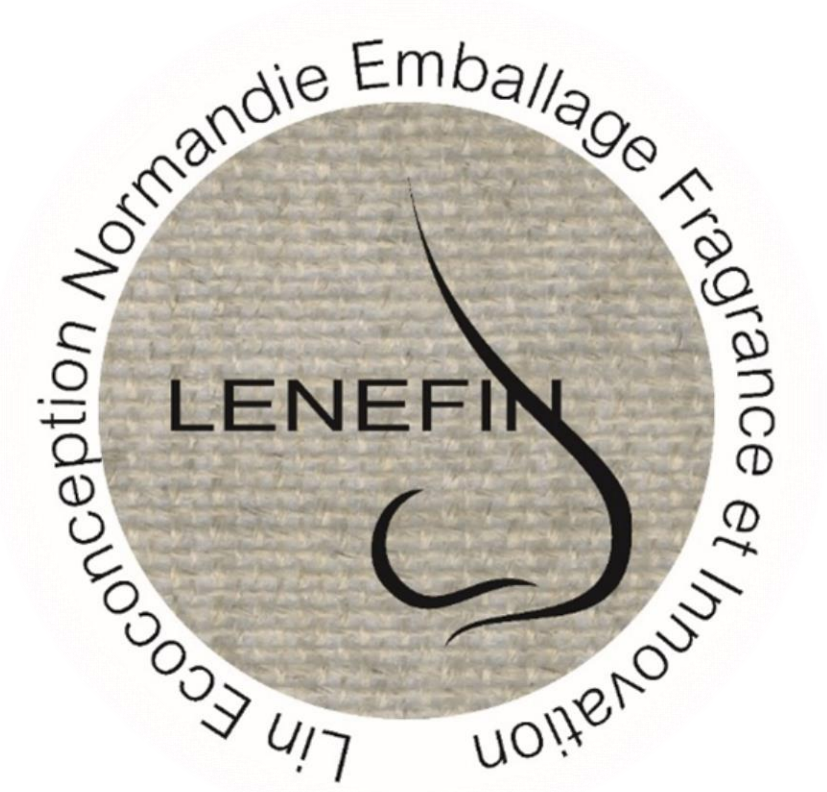
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VALORIZATION OF FLAX SHIVES IN COSMETIC CREATION OF AN INNOVATIVE SECONDARY PACKAGING



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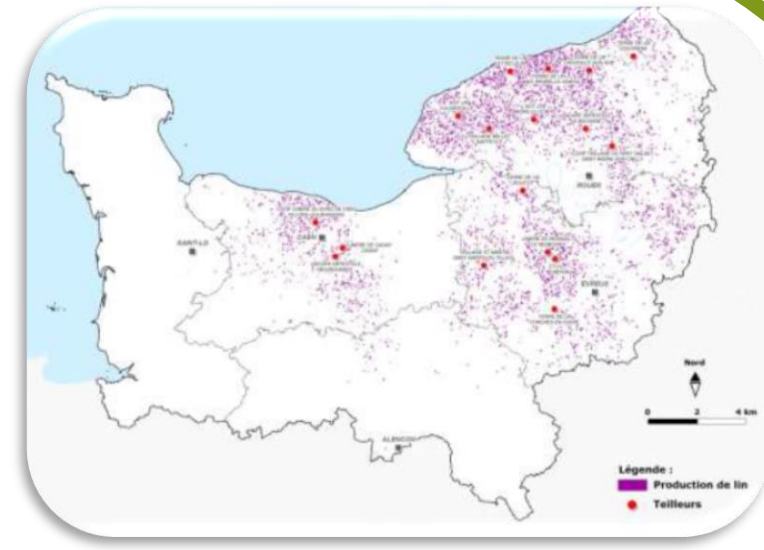
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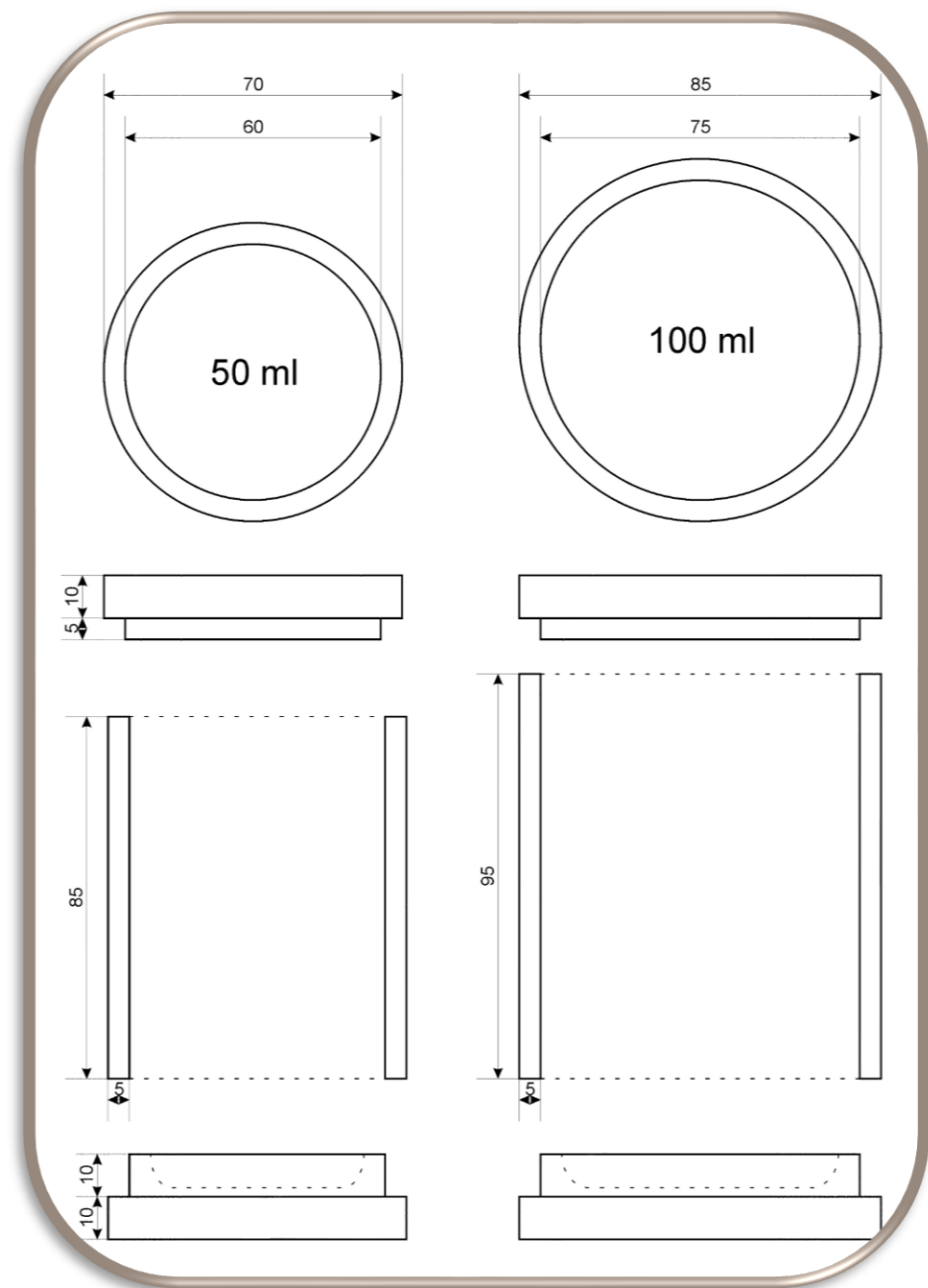
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ABSTRACT

LENEFIN COLLABORATIVE PROJECT : DESIGNING OF FLAX-BASED PERFUME BY USING FLAX PRINCIPALLY PRODUCED HEREIN NORMANDY, IDEALLY TWO PRODUCTS: FRAGRANCE AND SECONDARY PACKAGING [1].



DEVELOP A MODULAR SECONDARY PACKAGING THROUGH AN ECO-DESIGN APPROACH



BASE AND LID OF IDENTICAL SHAPE PRODUCED FROM A MINERAL MATRIX SUPPLEMENTED WITH FLAX SHIVES [2]

FORMULATION OF THE BASIC CEMENT MATRIX WITH VARIOUS CONCENTRATIONS OF RAW CRUSHED AND MINERALIZED FLAX SHIVES [3;4] RANGING FROM 5 TO 15%.

PERFORMING MECHANICAL TESTS OF HARDENING AS WELL AS WETTING-DRYING TESTS TO EVALUATE THE RESISTANCE TO WATER AND TEMPERATURE FOR ALL THE FORMULATIONS TO OBTAIN THE OPTIMAL DOSAGE OF FLAX SHIVES CRUSHED AND THUS MAKING IT POSSIBLE TO ENVISAGE A WIDE RANGE OF APPLICATIONS FOR A SECOND LIFE.

PROJECT SUPPORTED BY THE NORMANDY REGION AND EUROPEAN FUNDS FEDER (EUROPEAN REGIONAL DEVELOPMENT FUND).

OBJECTIVES

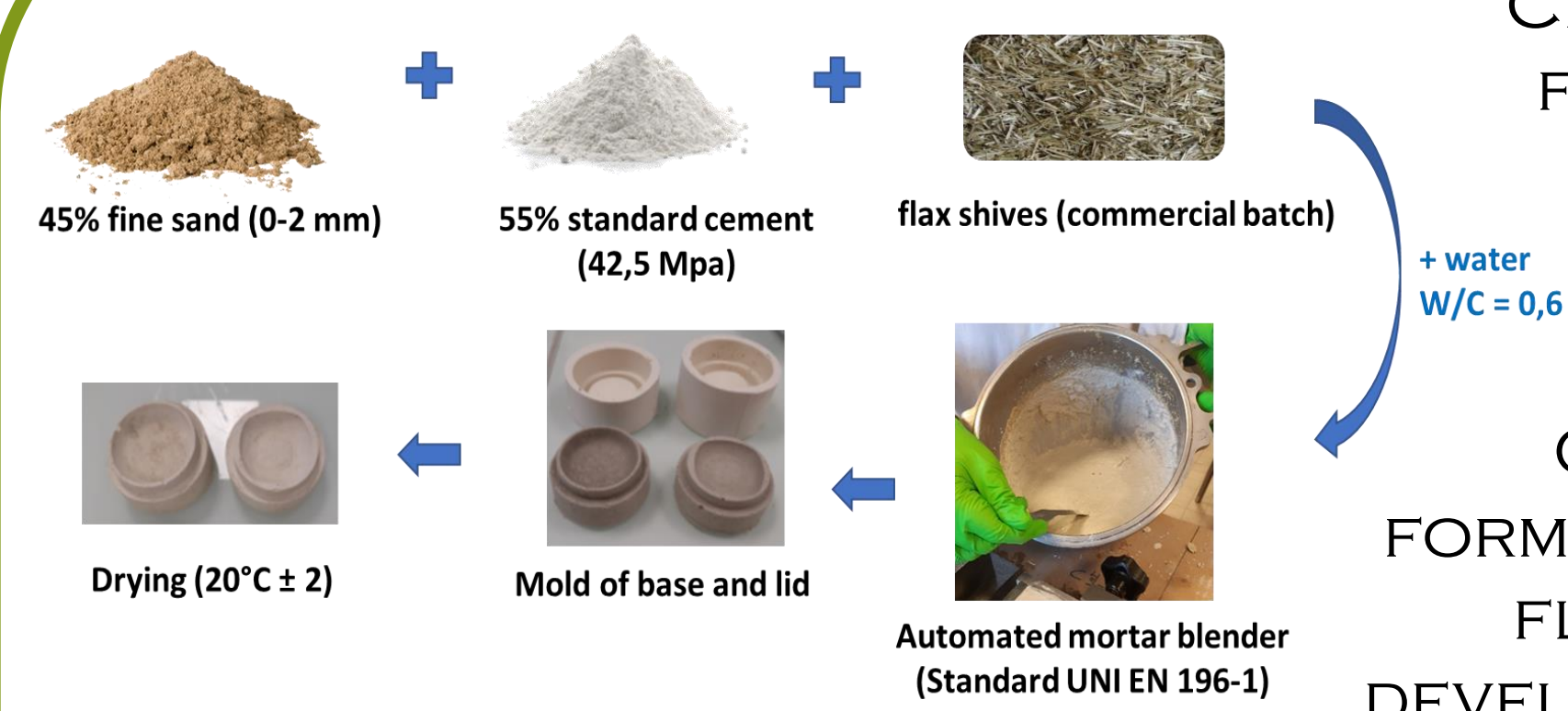


INVESTIGATION OF AN ECOFRIENDLY SECONDARY PACKAGING FROM FLAX SHIV AND MINERAL COMPONENT

ANALYSIS THE INFLUENCE OF WATER BEHAVIOR OF BIOBASED MORTARS

INTRODUCTION OF A RENEWABLE RESOURCE AND AVAILABLE LOCALLY IN THE AIM TO VALORISE/PROMOTE OF NORMANDY FLAX TOWARDS A NEW PRODUCT

METHOD



CHARACTERIZATION OF THE FLAX SHIVES TO KNOW ITS CHARACTERISTICS, ITS PERFORMANCE AND ITS LIMITS.

OPTIMIZATION OF THE FORMULATION OF BIO-SOURCED FLAX-MORTARS FOR THE DEVELOPMENT OF THE BASE AND THE LID OF THE PACKAGING

EVALUATION OF THE MECHANICAL PERFORMANCES

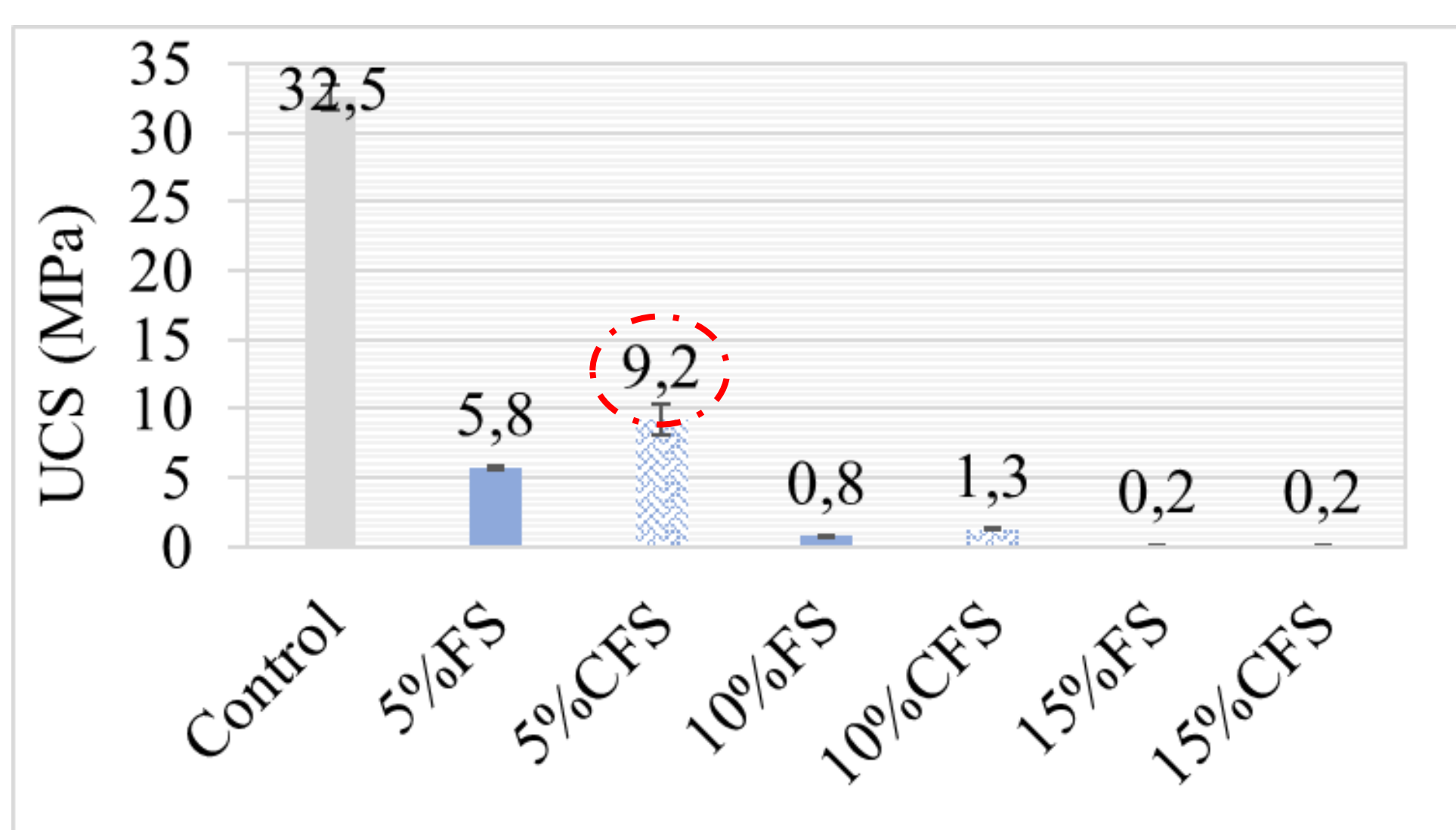
FLEXURAL RESISTANCE



UNCONFIRMED COMPRESSIVE STRENGTH (UCS)

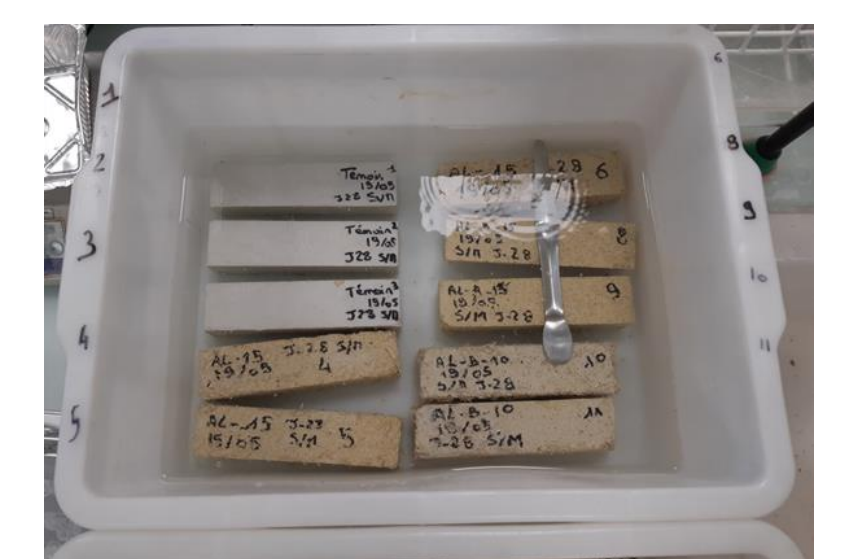
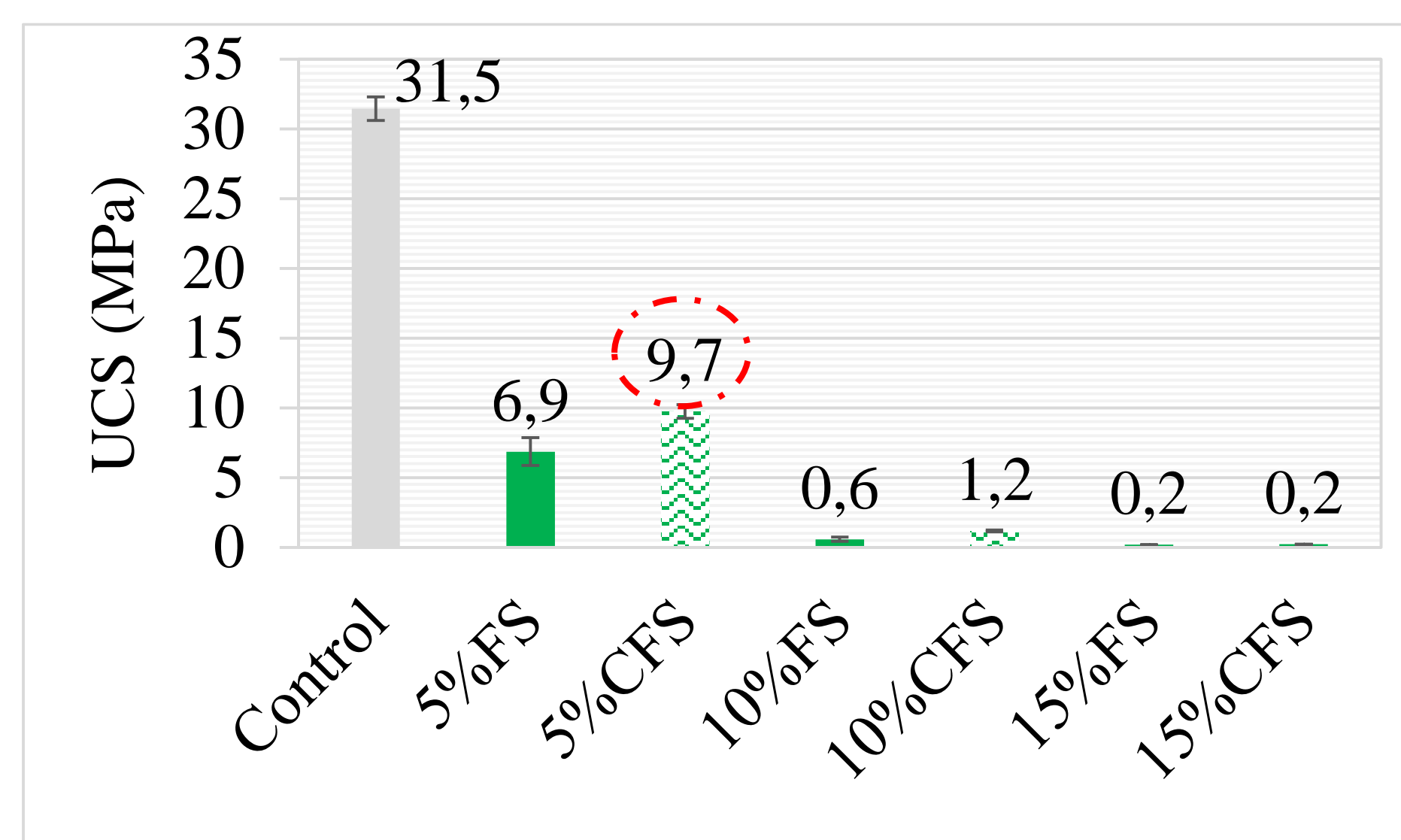
RESULTS

EFFECT OF FLAX SHIVES CONTENT ON MECHANICAL PERFORMANCES



OPTIMAL CONTENT MORE THAN 5% AND INFERIOR TO 10%.
OPTIMAL PARTICULES SIZE CRUSHED 1-2MM

WATER RESISTANCE



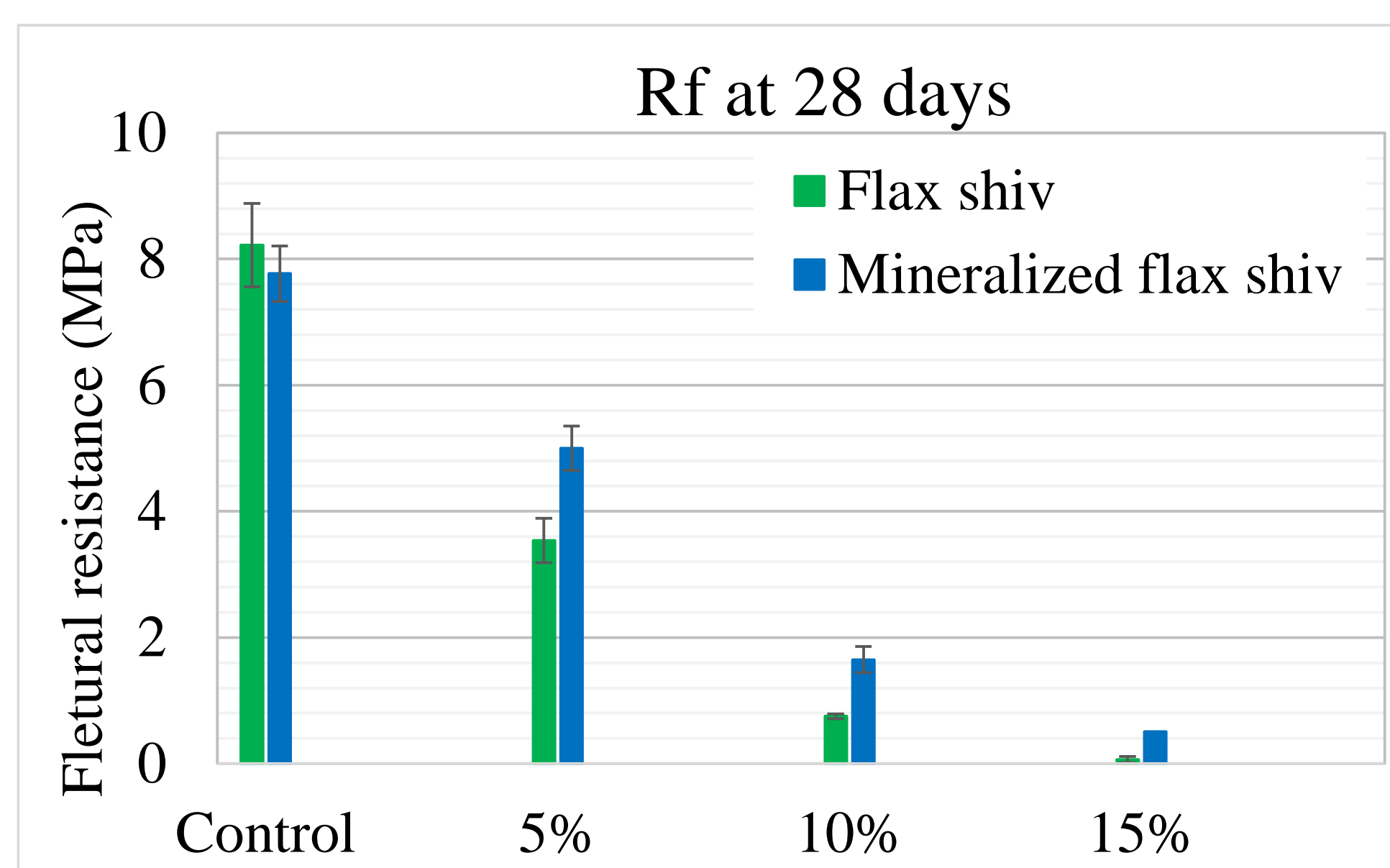
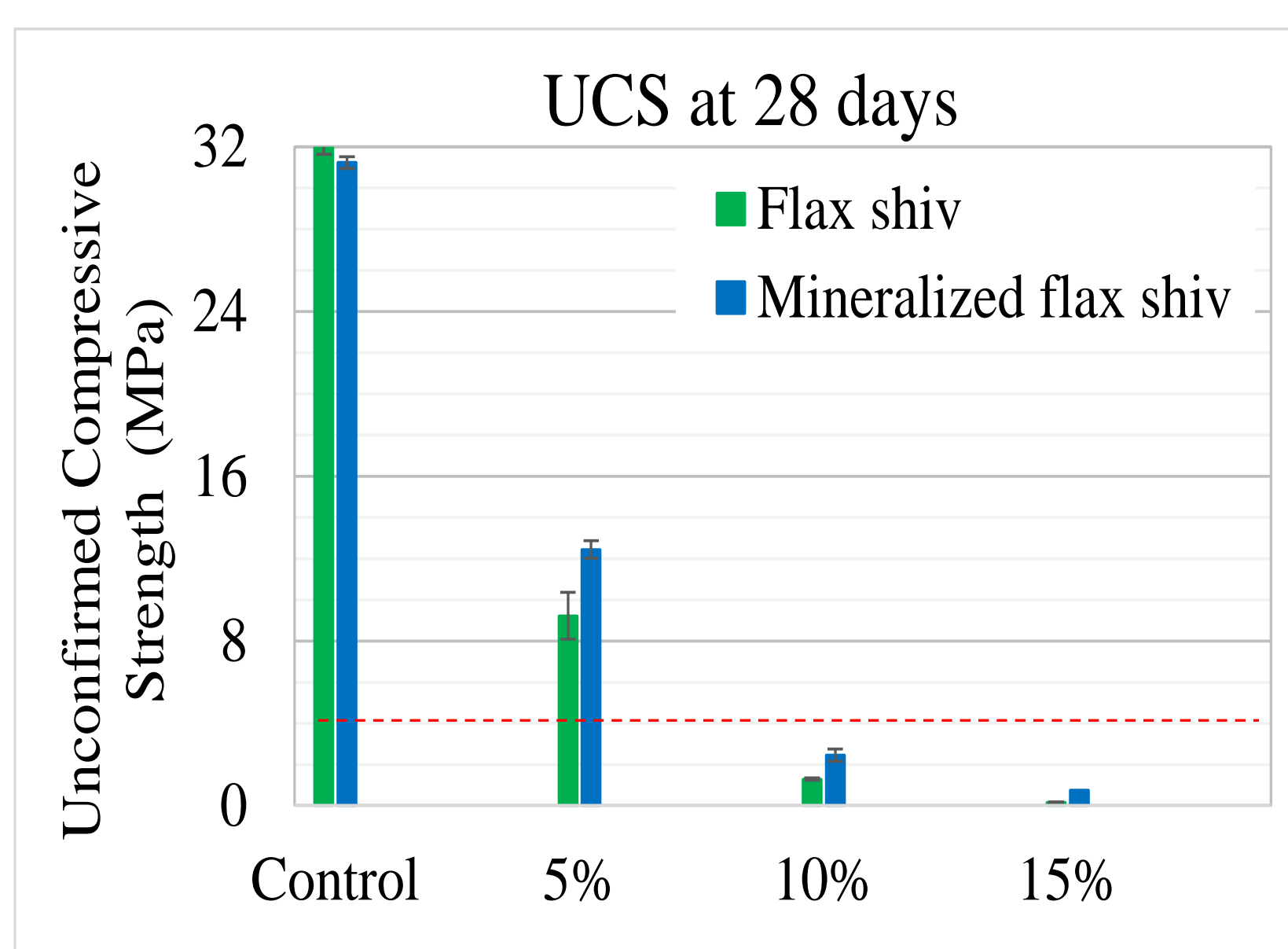
IMMERSION IN WATER IMPROVES UCS VALUE BY REACTIVATING HYDRATION [5]. THE OPTIMAL IS WITH CRUSHED FLAX SHIV AND 5% CONTENT

INFLUENCE OF MINERALIZATION OF FLAX SHIV ON MECHANICAL PERFORMANCES

TWO TYPE OF FLAX SHIVES USED



MINERALIZED FLAX SHIVES / FLAX SHIVES



INCREASE MECHANICAL RESISTANCE FOR THE MINERALIZATION OF FLAX SHIVES

UP TO 8% IN MASS (WT) FOR THE MASS CONTENT OF MINERALIZED FLAX SHIVES

CONCLUSION

- THE MAXIMUM MASS PERCENTAGE OF FLAX SHIVES IS 6% (30% BY VOLUME) AND THAT OF MINERALIZED CAN BE UP TO 8% WT. MINERALIZATION INCREASES MECHANICAL PROPERTIES.
- WATER RESISTANCE TESTS WERE ALSO CARRIED OUT ON THE SPECIMENS AND DEMONSTRATED HIGH WATER RESISTANCE. WHICH IS VERY POSITIVE FOR USE IN BATHROOM FOR EXAMPLE.
- THE USE OF LOCAL FLAX SHIV MORTARS IN SECONDARY PACKAGING IS THEREFORE POSSIBLE. IN PERSPECTIVE OF THIS STUDY, THE REALIZATION OF SCALE-UP AND BEHAVIOR TO HUMIDITY.

[1] GOMEZ-CAMPOS A. ET AL., JOURNAL OF CLEANER PRODUCTION, 2021, 281 : 125177
[2] RAHIM M. ET AL., ENERGY AND BUILDINGS, 2015, 88 : 91-99
[3] KALIA S. ET AL., IN POLYMER COMPOSITES, JOHN WILEY & SONS, LTD, 2013, P.239-288.
[4] BAILEY C. ET AL., COMPOSITES PART A: APPLIED SCIENCE AND MANUFACTURING, 2021,144 : 106333
[5] ZMAMOU H., 2015. THÈSE DE DOCTORAT DE L'UNIVERSITÉ DE ROUEN, 288P

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