

Incidence of Granulation of Press Cake on Solvent Extraction and Desolventization

P. Carre¹ – A. Quinsac¹ – J. Dechambre²

¹CREOL – 11, rue G. Monge – 33600 Pessac France

²CETIOM - 11, rue G. Monge – 33600 Pessac France

Granulation of the press cake before extraction becomes a trend in the processing of rapeseed. In this study we tried to understand the consequence of this treatment on extraction and desolventization. A batch of press cake has been extracted in a continuous pilot plant with and without granulation at two flow rates (135 / 230 kg/h). The marc has been desolventized in a Schumacher type desolventizer where the flow of sparge steam was adjusted to have a constant temperature in the duct of the vapours. Oil extractability was measured by a one minute extraction, a 3 hours extraction and a last extraction preceded by a milling. Oil residues in the meal were determined; hexane residues were measured in the marc and in the meal.

Granulation reduce the short time extractability (50 % for non granulated cake vs 17 % for granulated cake) but increase the total extractability (90 % for cake vs 95 % for granulated cake). The hexane content in marc is significantly decreased by granulation (27 % vs 23 % at 135 kg/h ; 28.7% vs 21.9 % at 230 kg/h). Hexane content in the meal is reduced in granulated cakes (394 vs 148 ppm at 135 kg/h ; 226 vs 122 ppm at 230 kg/h). Granulation brings lower oil residues in the meal at 135 kg/h (2,4 % vs 2,1%) but higher at 230 kg/h (2,8 % vs 3,2 %).

Granulation improves significantly the functioning of the extraction plant by a better drainage of the solvent. The lower amount of solvent in the marc makes it possible to decrease the consumption of steam during desolventization as high as 30 %. If the total oil extractability is improved, more time is needed to complete this recovery, therefore, the limit of this technology is given by long time extractability. This drawback could be addressed by reducing the pellets diameter.