ARAMID FIBRES IMPROVEMENTS FOR A SUPERIOR PERFORMANCE IN FRICTION APPLICATIONS

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KEYWORDS – Aramid fibres, Fibrillation, Specific surface area, Fibre length, Improved performance

ABSTRACT
Aramid fibres are used all over the world in friction applications. Both in NAO/non-steel and low steel formulas, aramid fibres offer a unique combination of properties for improved processing and performance of friction materials. Heracron® aramid fibres are high tenacity, high modulus fibrillated fibres with excellent strength, thermal and chemical resistance.

An improved production technology of aramid fibres was developed to obtain the best combination of fibre length, fibrillation, specific surface area, moisture content and mechanical strength. This paper describes the evaluation results of all the different materials produced during this process improvement in comparison to reference grades.

Methodologies used in order to characterise different behaviour of various aramid pulps in friction materials are Canadian Standard Freeness, filler retention, pre-forming strength, Charpy impact resistance and Dynamometer NVH test. The paper describes the found correlations between these properties and aramid fibre ratio among specific surface area (S.S.A.) and fibre length. Higher ratios between specific surface area and fibre length give the best results; although there is an asymptotic behaviour regarding this particular property. The optimal S.S.A. and fibre length ratio is combined with an optimised production process, making these new developments a good alternative in the friction industry.

From an application performance point of view and in comparison to reference grades, the improvements done to the aramid fibres show positive results and give superior performance in terms of friction properties. This study shows that it is important to focus on the right length and S.S.A. ratio to obtain optimal aramid fibres for friction materials. Focussing only on highest fibrillation levels is an expensive option with no additional performance advantages in the end application.