EXTENDED ABSTRACT OF THE PAPER
"Confined flame treatment: a new flame treatment process particularly suitable for coextruded sealable and metallized films. Comparison with standard flame treatment, process characterization and its applications on different substrates and materials types"

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This paper, as the title underlines, will be focused on an esseCI srl recently developed flame treatment process, named "confined flame treatment" or "hot plasma treatment", to differentiate it from the standard flame treatment process.
Firstly the new process will be introduced from an "hardware" point of view, underlying the differences, with the standard flame treatment, on flame treatment plant composition.

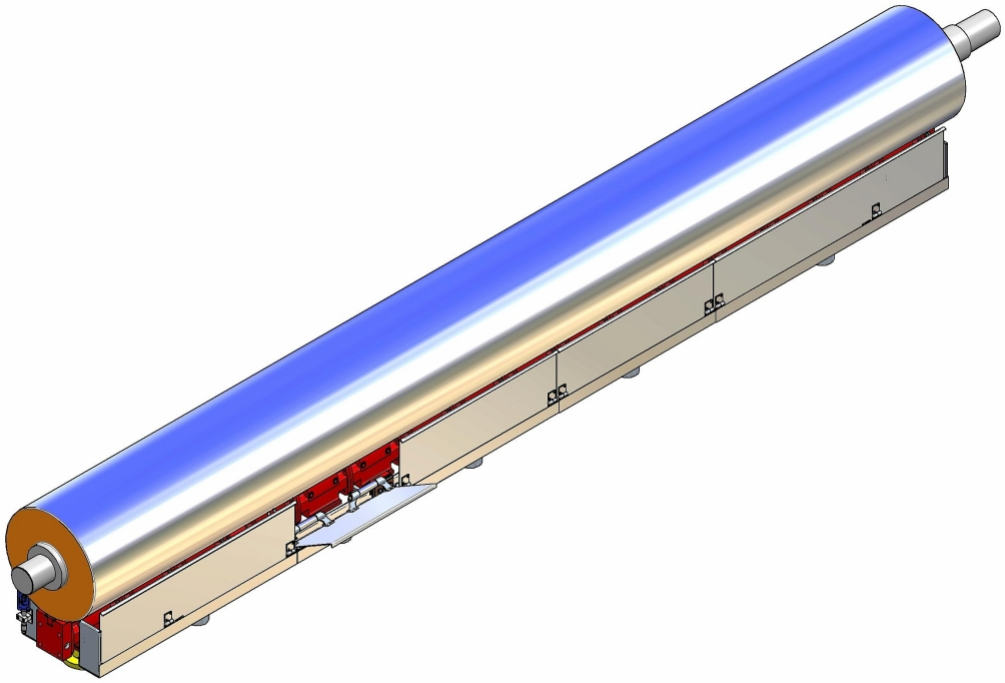

FIG.1 – Confined Flame Treatment plant aspect

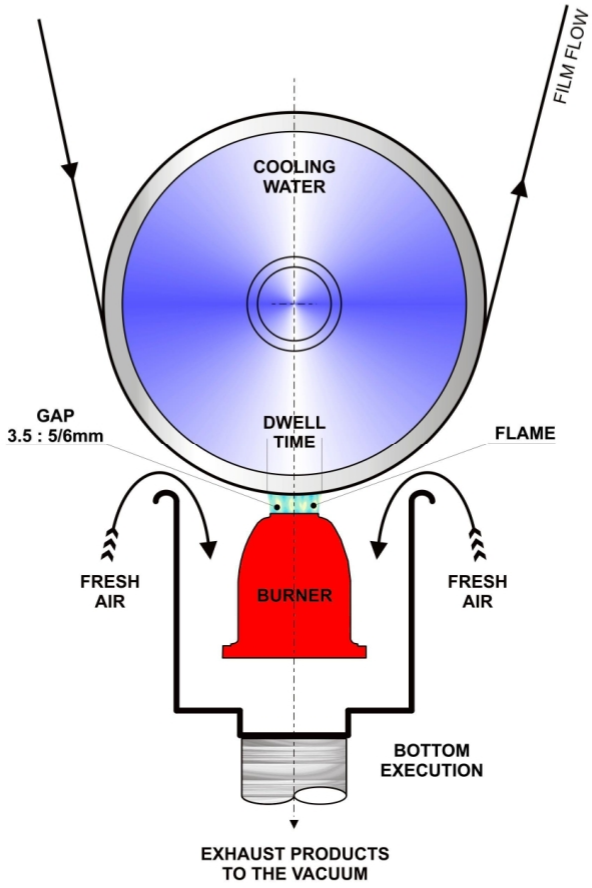

FIG.2 – Confined Flame Treatment plant section

Will, then, follow a comparison, between the two processes, in terms of energy balances, putting attention on how the produced combustion energy is distributed among the different plant components (burner, treatment roll) to the treated web and to the surrounding room, basing on temperature and pressure measures taken on esseCI srl pilot plant, while running in the new configuration. Examples of experimental curves are given in the following page:

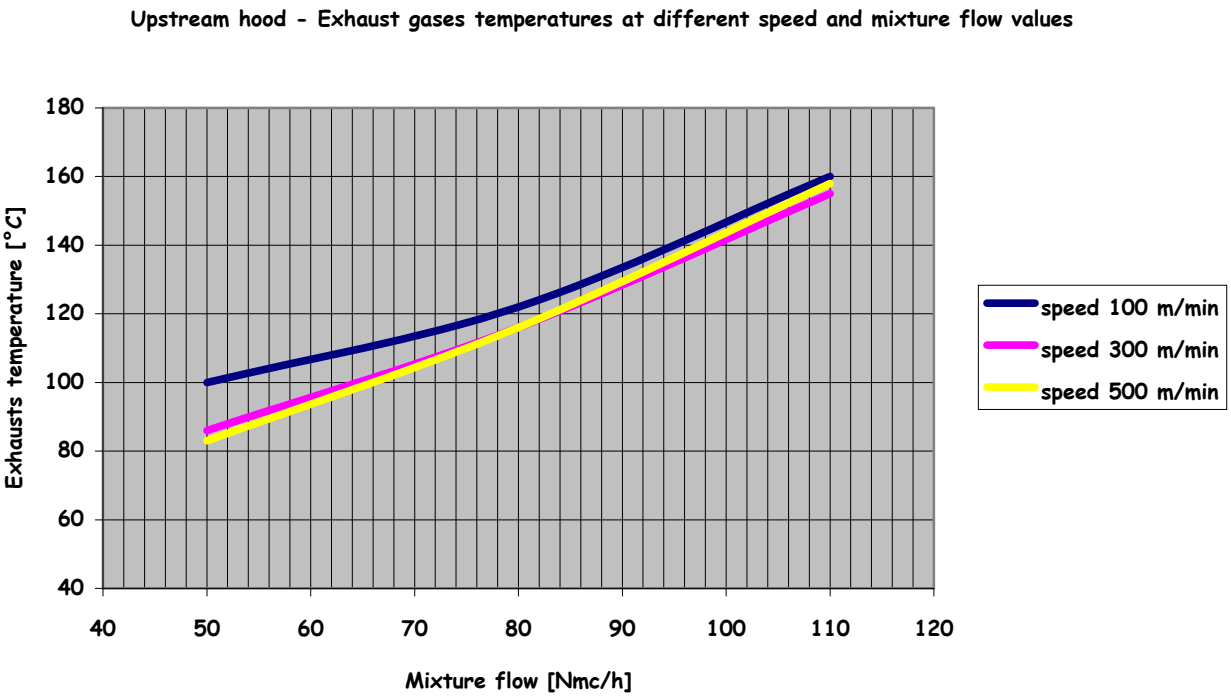

FIG.3a – Exhaust gases temperature profiles

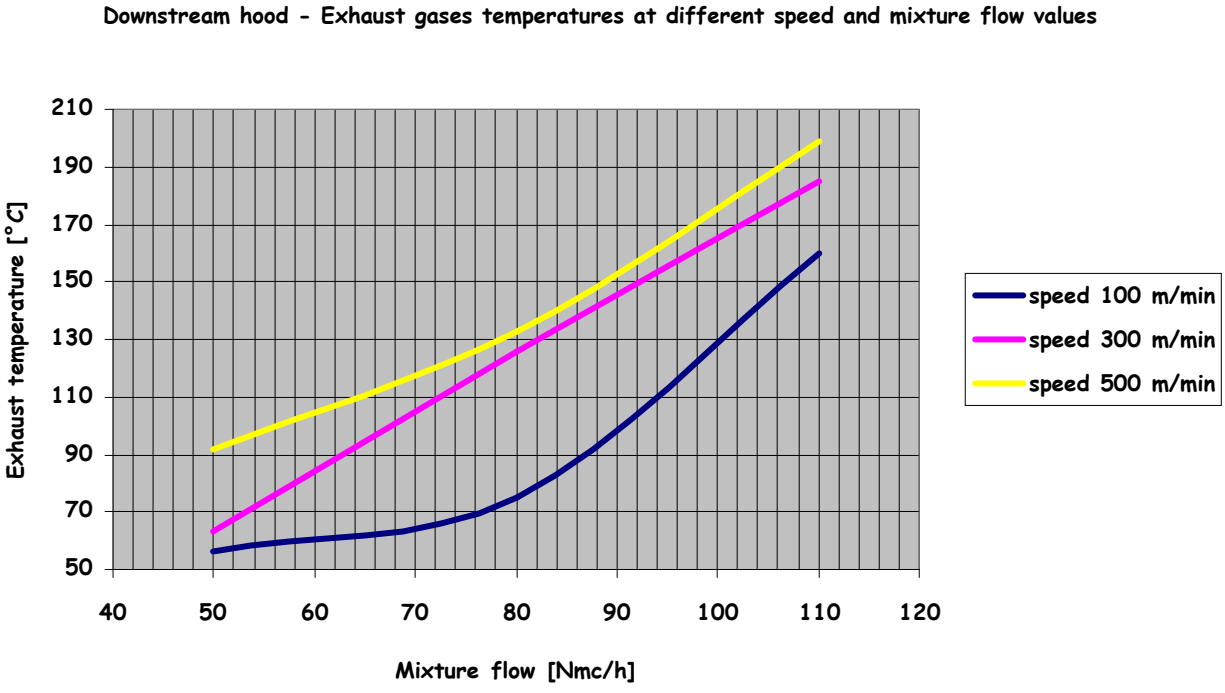

FIG.3b – Exhaust gases temperature profiles

The paper will then focus on an introduction of the new process from a “software” point of view, describing the main steps to be followed for getting maximum yield from the hot plasma treatment and investigating the main differences with the standard flame treatment process and with the other most common surface treatment techniques.

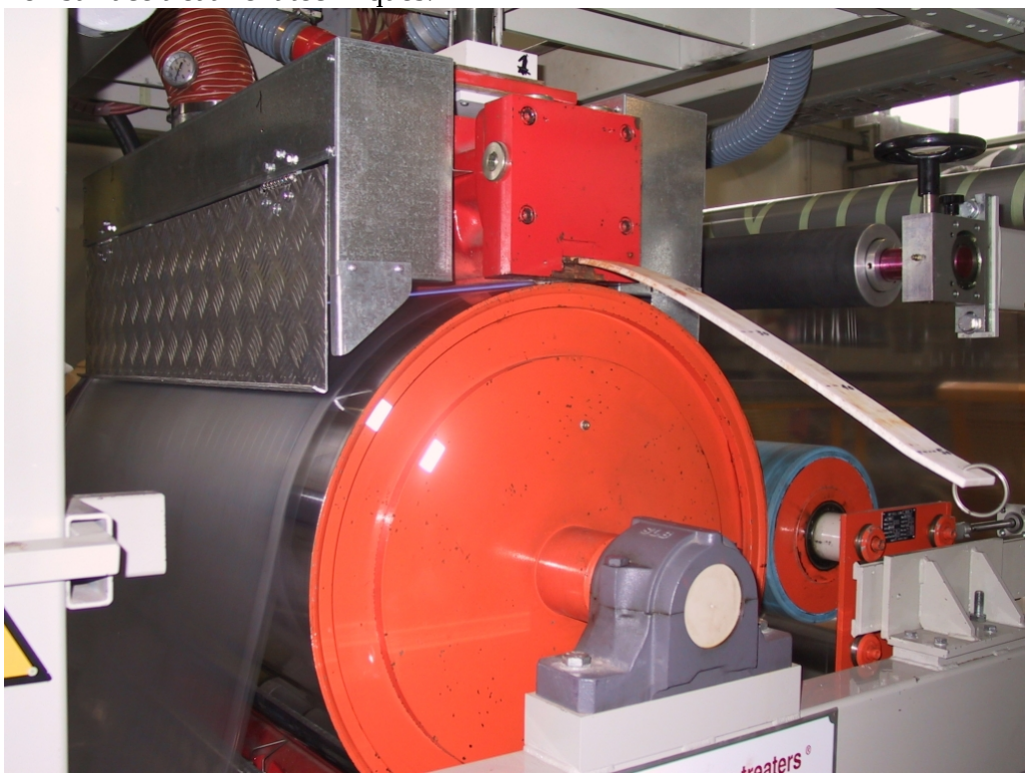

FIG.4 – Confined flame treater mounted on esseCI pilot plant

A series of tests results, obtained running trials with esseCI pilot plant on different substrates types, will be presented and commented.

CONFINED FLAME TREATMENT APPLICATIONS

Sealable Coex films

	1	2	3	4	5	6
Mixt . [m ^{3}/h*m]	27	32	32	42	33	33
Gap [mm]	3.2	3.5	3.5	3.8	3.5	3.5
T Jono [°C]	812	795	795	820	820	810
Speed [m/ min]	300	280	280	300	300	300
Roll Temp .[°C]	25	25	25	20	18	18
Dynes /cm	52	48	48	48	44	42
Film aspect (stripes)	N	N	N	N	N	N
Sit – Delta T	112° 0°C	116° +2°C	114° +0°C	124° +6°C	122° +4°C	121° +3°C

FIG.5 – Confined flame treatment application on sealable films