

A light gray world map is centered in the background, showing the outlines of continents and some small dots indicating locations.

GREEN SAND TECHNOLOGY

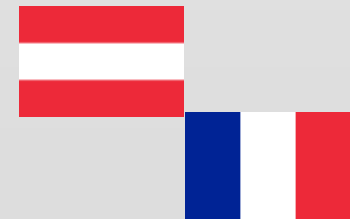
CARBOLUXON – CARBOFLUID

Producers of Lustrous Carbon



France

Collaboration with GIBA – april 2012



GREEN SAND TECHNOLOGY

CARBOLUXON - CARBOFLUID

HAF produces in its plants of Pont Sainte Maxence around 9000t/year of lustrous carbon producers for the foundry industry

In powder or liquid form.

In powder form :

CARBOLUXON

Pure or enriched Coal Dust

In liquid form :

CARBOFLUID

Lustrous carbon to replace totally coal dust

in the sand system: —————→

CARBOFLUID N

Concentrated lustrous carbon producer

for use in conjunction: —————→

CARBOFLUID P

Lustrous carbon producer to replace partly coal dust

in the sand system: —————→

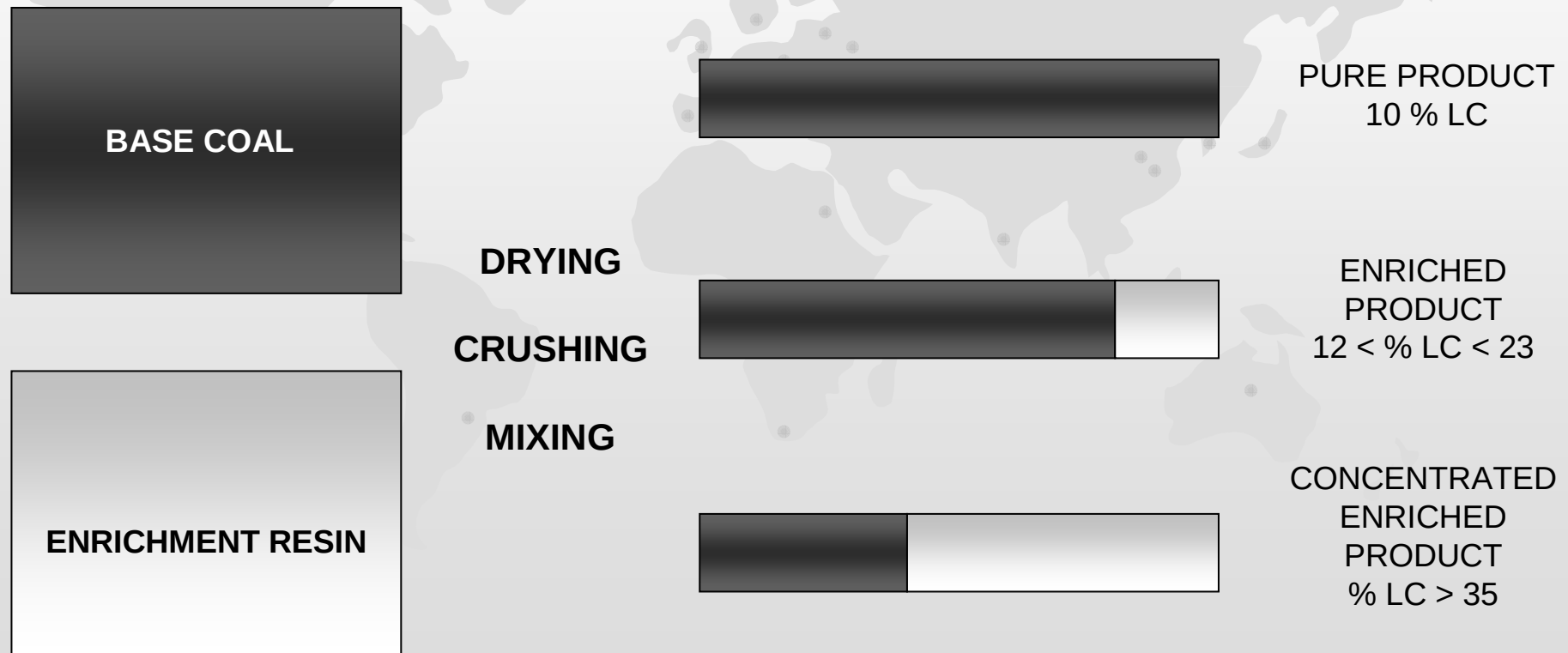
CARBOFLUID M



GREEN SAND TECHNOLOGY

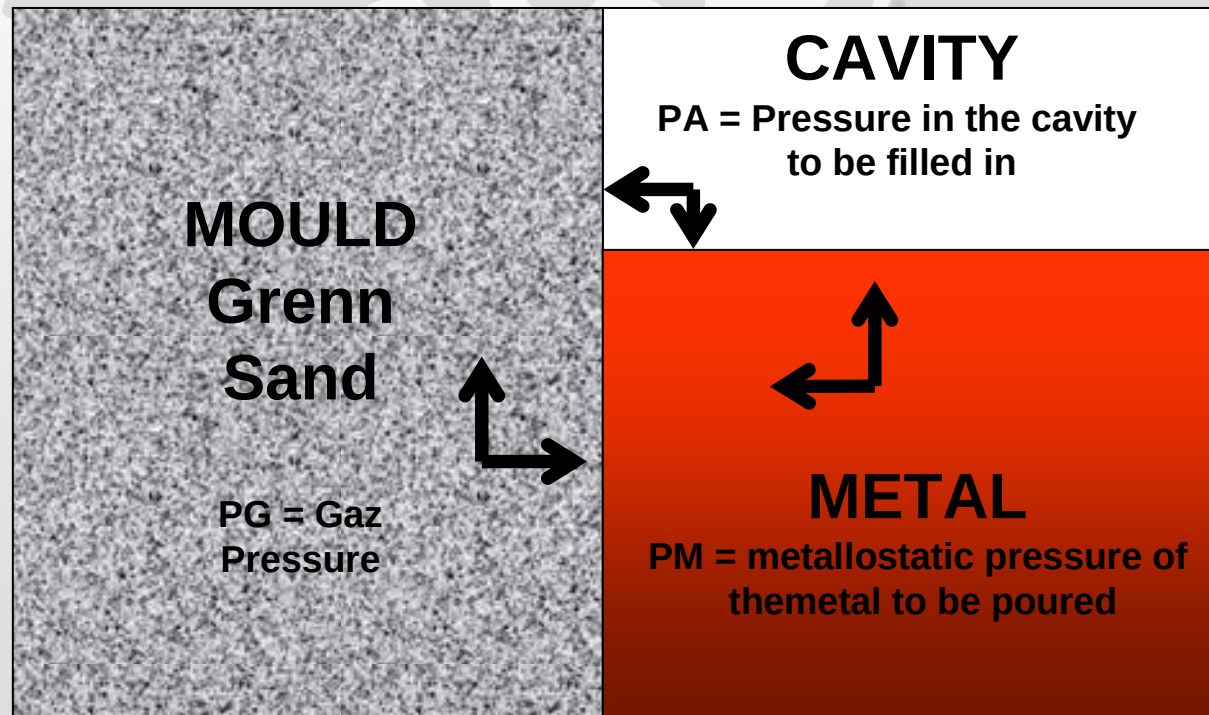
CARBOLUXON - CARBOFLUID

Definition of a lustrous carbon producer – pure and enriched coal dust – in liquid or powder form :



Rule of a lustrous carbon producer – schematic description :

LAW OF THE PRESSURE EQUILIBRIUM – REDUCING ATMOSPHERE – FORMATION OF LUSTROUS CARBON



DEFECT-FREE CASTING

- Formation and deposition of LC on casting surface
- Development of reducing atmosphere
- Creation of a back pressure by release of volatiles components
- To get a perfect law of casting
 $PA < PM = PG$



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GREEN SAND TECHNOLOGY

CARBOLUXON - CARBOFLUID

Physical and chemical decomposition : **CARBOLUXON** (not enriched)

CARBOLUXON

Pure product (crushed coal) resulting from fabrication process

DRIED PRODUCT

H₂O
4%

After drying at 105 °C

Residual cokes
63%

Volatiles 37%

After calcining at 900 °C without O₂ / 7' = % Volatiles
% Residual cokes = 100 – % Vol

Residual carbon
57%

Ashes
6%

Volatiles 37%

After calcining at 900 °C without O₂ / 3h = % Ashes
% Residual carbon = % Residual cokes – % Ashes

S < 1%

N < 1%

LUSTROUS
CARBON
10 %

LUSTROUS CARBON – test at 900°C on silica wool

GREEN SAND TECHNOLOGY

CARBOLUXON - CARBOFLUID

Physical and chemical decomposition : CARBOLUXON Z 160 (enriched with 16% LC)

CARBOLUXON Z160

Pure product (crushed coal) resulting from fabrication process

DRIED PRODUCT

H₂O
3%

After drying at 105 °C

Residual cokes
54%

Volatiles 46%

After calcining at 900 °C without O₂ / 7' = % Volatiles
% Residual cokes = 100 – % Vol

Residual carbon
49%

Ashes
5%

Volatiles 46%

After calcining at 900 °C without O₂ / 3h = % Ashes
% Residual carbon = % Residual cokes – % Ashes

S < 0,8%

N < 0,8%

LUSTROUS
CARBON
16 %

LUSTROUS CARBON – test at 900°C on silica wool

GREEN SAND TECHNOLOGY

CARBOLUXON - CARBOFLUID

Physical and chemical decomposition : CARBOLUXON Z 380 (enriched and concentrated 38% LC)

CARBOLUXON Z380

Pure product (crushed coal) resulting from fabrication process

DRIED PRODUCT

H₂O
2%

After drying at 105 °C

Residual cokes
29%

Volatiles 71%

After calcining at 900 °C without O₂ / 7' = % Volatiles
% Residual cokes = 100 – % Vol

Residual carbon 25%

Ashes
4%

Volatiles 71%

After calcining at 900 °C without O₂ / 3h = % Ashes
% Residual carbon = % Residual cokes – % Ashes

S < 0,6%

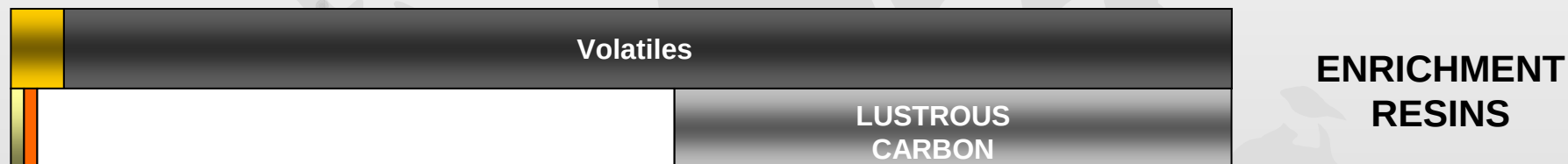
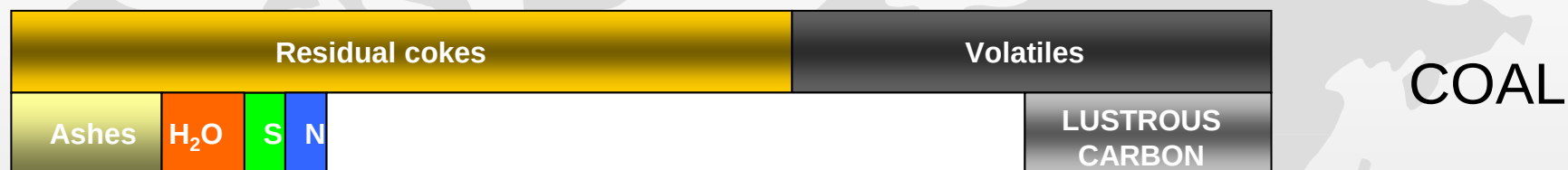
N < 0,6%

LUSTROUS
CARBON
38 %

LUSTROUS CARBON – test at 900°C on silica wool

GREEN SAND TECHNOLOGY CARBOLUXON - CARBOFLUID

ENRICHMENT MATERIALS – Description and definition



FORMULATION IN POWDER FORM YES Or NOT

FORMULATION IN LIQUID FORM YES Or NOT

Family 1

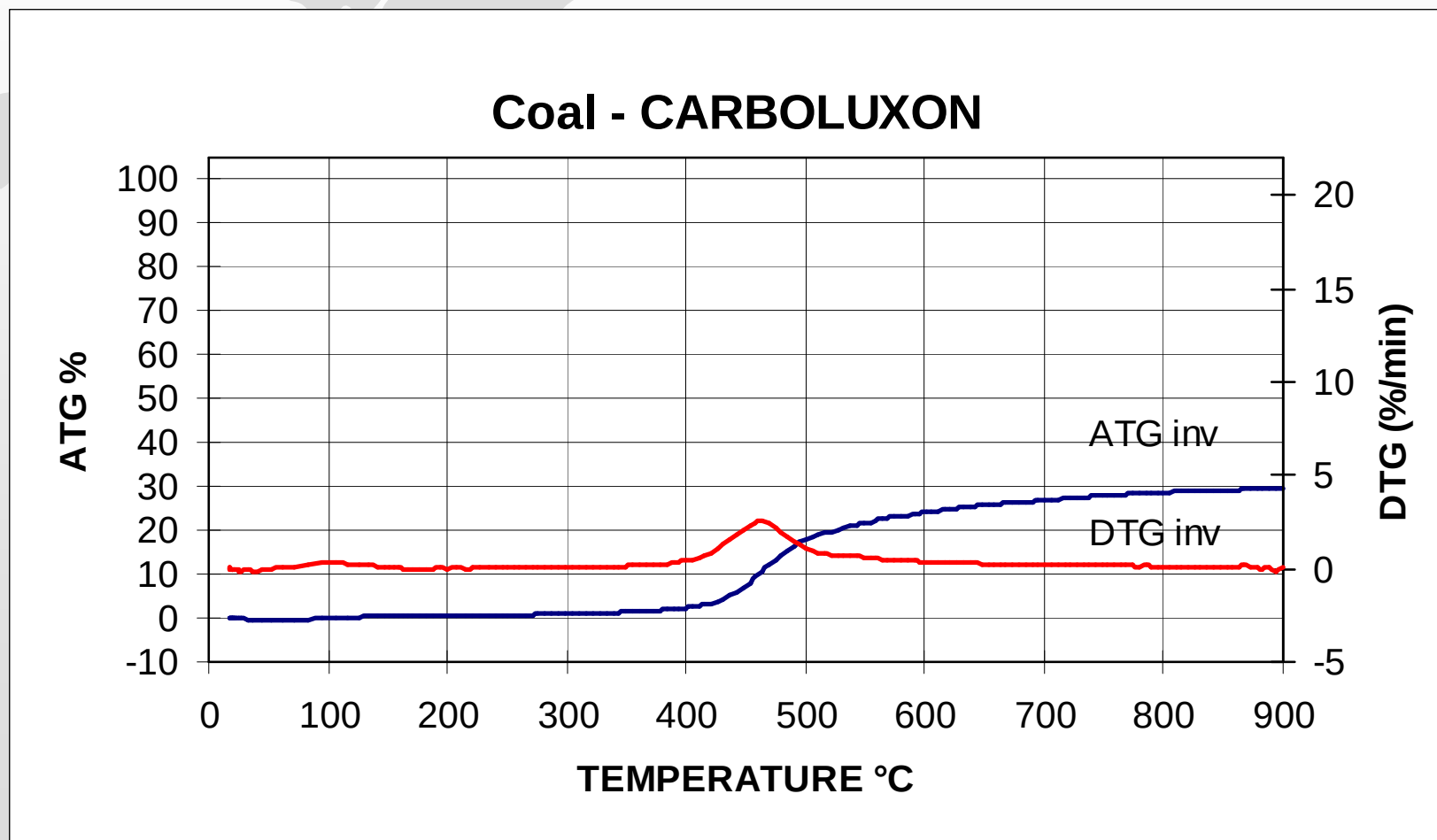
Family 2

Family 3

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CARBOLUXON - CARBOFLUID

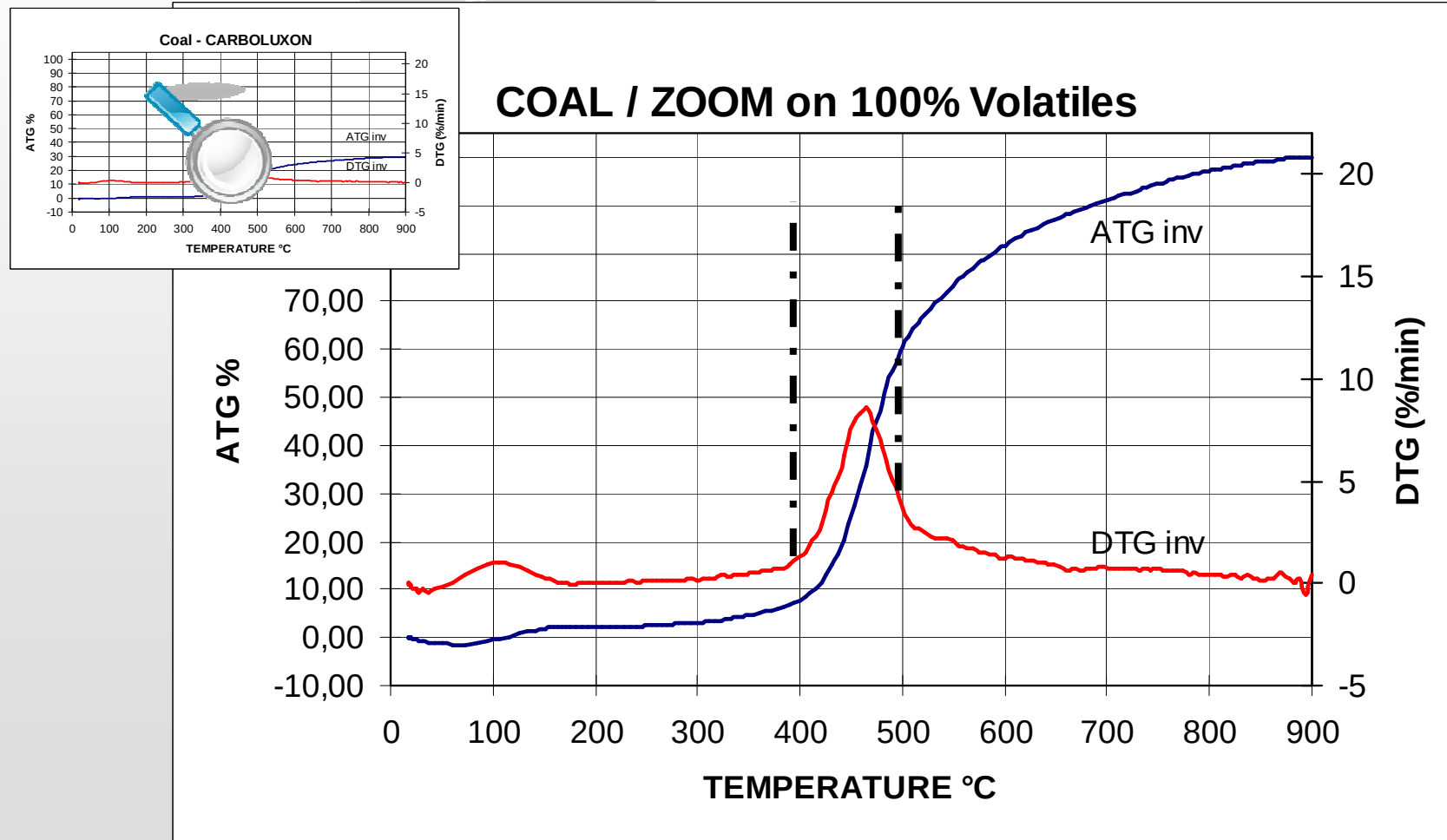
GRAPH ATG/DTG – RELEASE OF VOLATILES – QUALITATIVE AND QUANTITATIVE CHARACTERISTICS - SPEED



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CARBOLUXON - CARBOFLUID

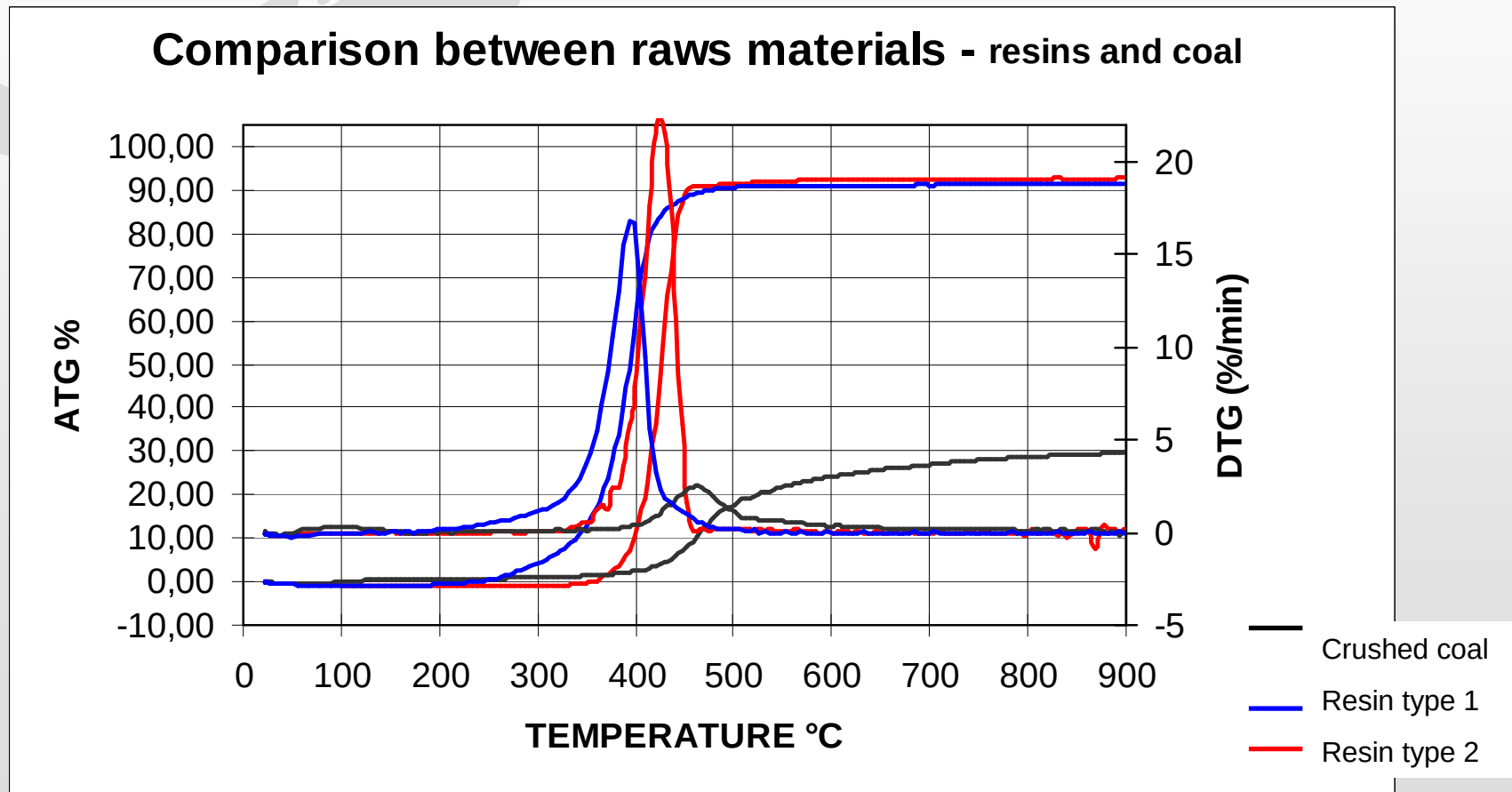
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GREEN SAND TECHNOLOGY

CARBOLUXON - CARBOFLUID

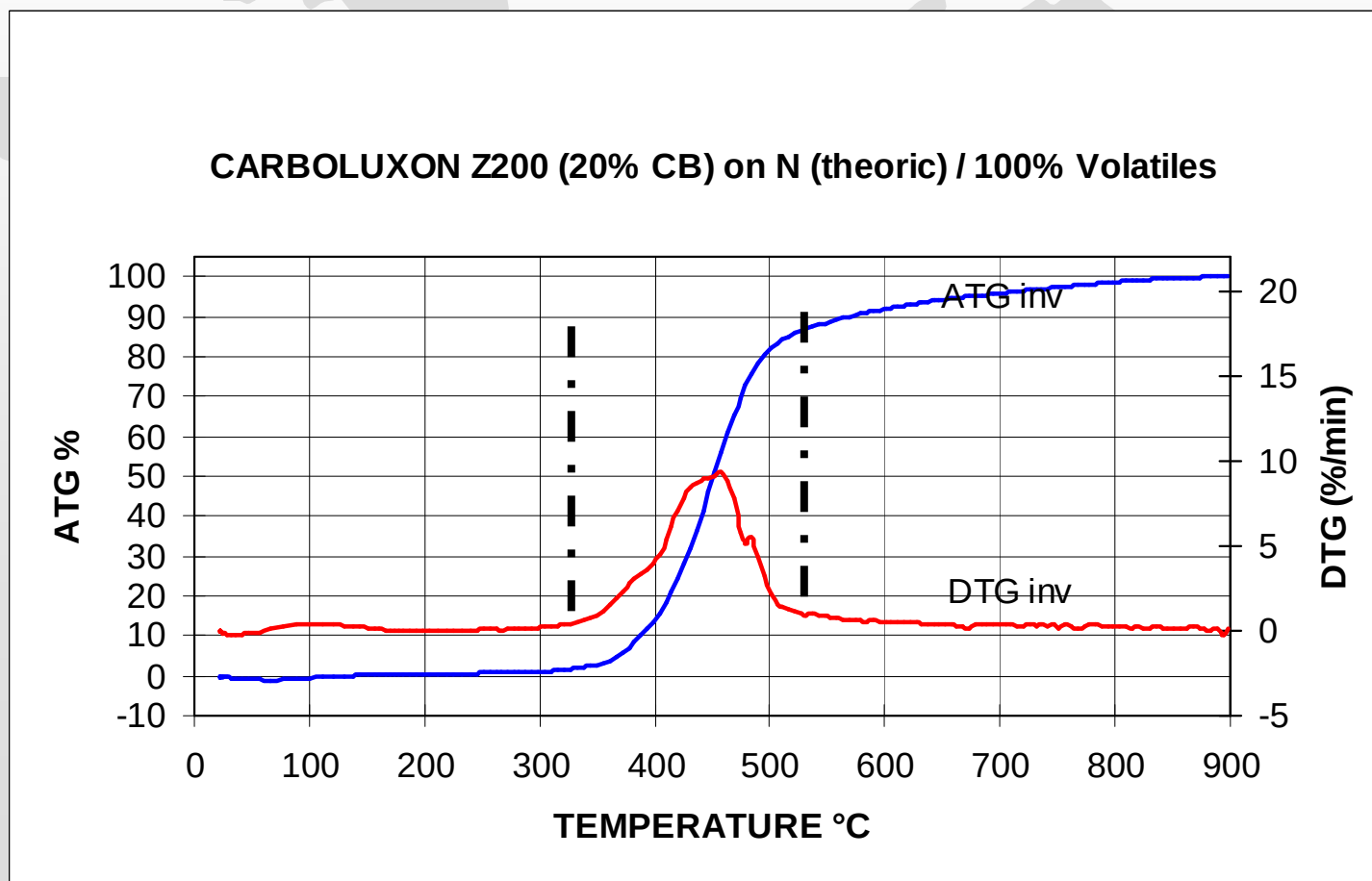
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GREEN SAND TECHNOLOGY

CARBOLUXON - CARBOFLUID

GRAPH ATG/DTG – RELEASE OF VOLATILES – QUALITATIVE AND QUANTITATIVE CHARACTERISTICS – SPEED
SPECIFIC CASE OF A FINISHED PRODUCT – ENRICHED COAL DUST



Range of CARBOLUXON

PRODUCT	% Lustrous carbon	% Volatiles	% Cokes
pure product			
CARBOLUXON 41D30	10	35	61
enriched product			
CARBOLUXON 42E42	14	42	55
CARBOLUXON 42E48	16	44	53
CARBOLUXON 42E54	18	46	51
CARBOLUXON 43F70	23	52	48
concentrated product			
CARBOLUXON Z380	38	70	29

Making a choice according to the use process already set up or to be defined

GREEN SAND TECHNOLOGY CARBOLUXON - CARBOFLUID

SAFETY REQUIREMENTS FOR THE ENRICHED PRODUCTS IN POWDER FORM OR NOT

TRANSPORT / product as dangerous classified (ADR regulations)

STORAGE AND UTILIZATION / application of the ATEX Directive

BULK STORAGE / application of the Seveso Directives (classified facilities for the protection of the environment)



Technical alternative to get round these restrictions : PREMIX PRODUCT (coal mixed with clay)

Only :

PREMIX with max 15 to 20% de Coal Dust (enriched or not) in the mixture !

And with technical impact on the management of sand plants :

DIFFICULTY TO CONTROL THE DOSING OF BOTH PRODUCTS WHICH HAVE DIFFERENT FUNCTIONS (Cokes – Volatiles – activ clay – moisture...)

GREEN SAND TECHNOLOGY

CARBOLUXON - CARBOFLUID

TECHNOLOGICAL ADVANCEMENT : an other alternative with liquid coal dust

CARBOFLUID

Not as dangerous classified (ADR)

No ATEX Equipment

Non self inflammable product



Packaging types :

- IBC Container
- Bulk Tank



Dosing and transfer by pumping :



TECHNOLOGICAL EVOLUTION : Advantages CARBOFLUID

Flexible product change :

CARBOFLUID N
CARBOFLUID M
CARBOFLUID P

Reduction or removal of transport and storage constraints for solutions in powder form

Return to an easy management of the sand plants

Control of fines reintroduction

Better stability of moisture rate of greensand

Reduction clay and/or coal consumption

Better flowability of moulding sand

Dosing rapidly adjustable



TECHNOLOGICAL EVOLUTION : Range of CARBOFLUID

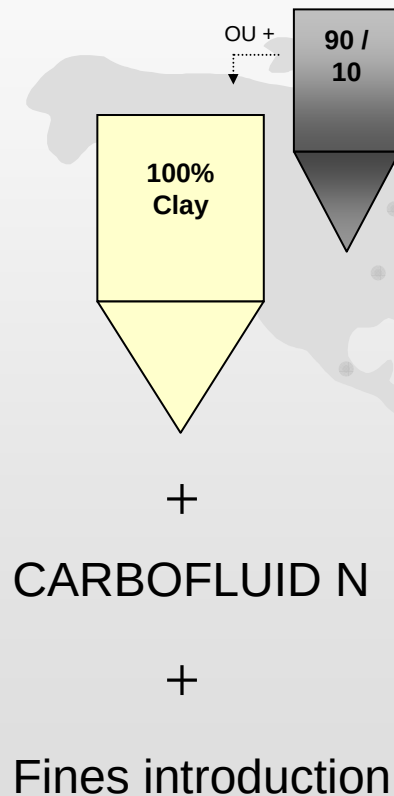
PRODUCT	% Lustrous carbon	% Volatiles	% Cokes
Product ready to use alone			
CARBOFLUID 47N42	14	37	29
CARBOFLUID 47N48	16	39	27
CARBOFLUID 47N54	18	41	25
mixed Product			
CARBOFLUID 47M90	30	57	12
Concentrated Product			
CARBOFLUID 47P50	43	85	2

Making a choice according to the use scenario already set up or to be defined

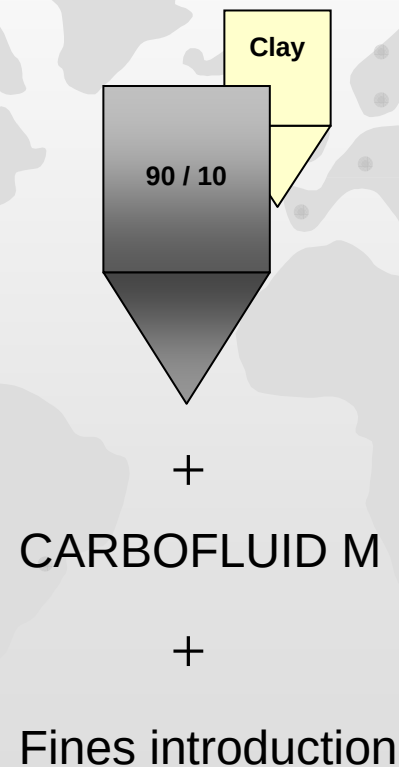
Solutions interchangeable or easily progressive solutions

GREEN SAND TECHNOLOGY CARBOLUXON - CARBOFLUID

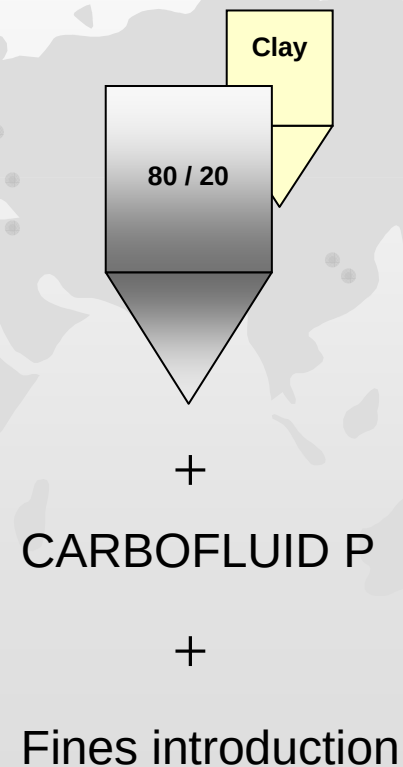
SCENARIO 1



SCENARIO 2



SCENARIO 3



Selection criteria

- Solutions face to storage constraints
- Quantities used
- Technical solutions to quality problems
- economical and technical benefits
- Appreciable reduction of consumables
- Ability to introduce fines
-

HA Assistance



GREEN SAND TECHNOLOGY

CARBOLUXON – CARBOFLUID

Producers of Lustrous Carbon

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