CEN TC 238
Update of EN 437 for NG/H_2 mixtures

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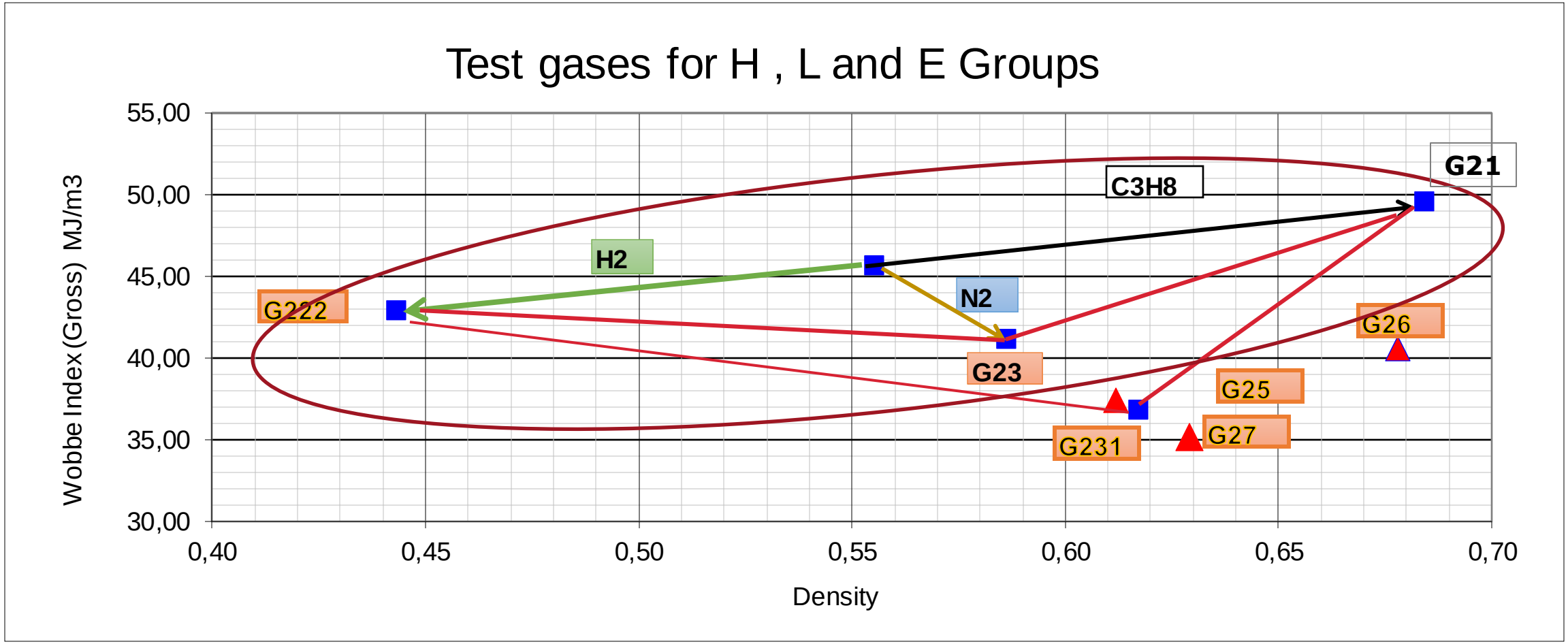
EN 437

- EN 437 defines test gases, test pressures and categories of appliances burning gaseous fuels mainly natural gases of groups H, L et E as well as LPGs and Manufactured gases

	Gross Wobbe index, dry gas 15 °C and 1 013,25 mbar MJ/m3	
Second family	39,1	54,7
— Group H	45,7	54,7
— Group L	39,1	44,8
— Group E	40,9	54,7

EN 437

- It defines also for each category the reference and limit gases
  - **Measure the performances and emissions and to check the safety**



Test gases

Incomplete combustion gas
Light (flash-back)
Flame lift
Over heating

Gas family and Group	Test gases	Designation	Composition by volume	*W* i	*H* i	*W* s	*H* s	*d*
			% [c]	MJ/m3	MJ/m3	MJ/m3	MJ/m3	
Group H	Reference gas	G 20	CH4 = 100	45,67	34,02	50,72	37,78	0,555
	Incomplete combustion and sooting limit gas	G 21	CH4 = 87 C3H8 = 13	49,6	41,01	54,69	45,28	0,684
	Light back limit gas	G 222	CH4 = 77 H2 = 23	42,87	28,53	47,87	31,86	0,443
	Flame lift limit gas	G 23	CH4 = 92,5 N2 = 7,5	41,11	31,46	45,66	34,95	0,586
	Over heating limit gas d	G 24	CH4 = 68 C3H8 = 12 H2 = 20	47,01	35,7	52,09	39,55	0,577

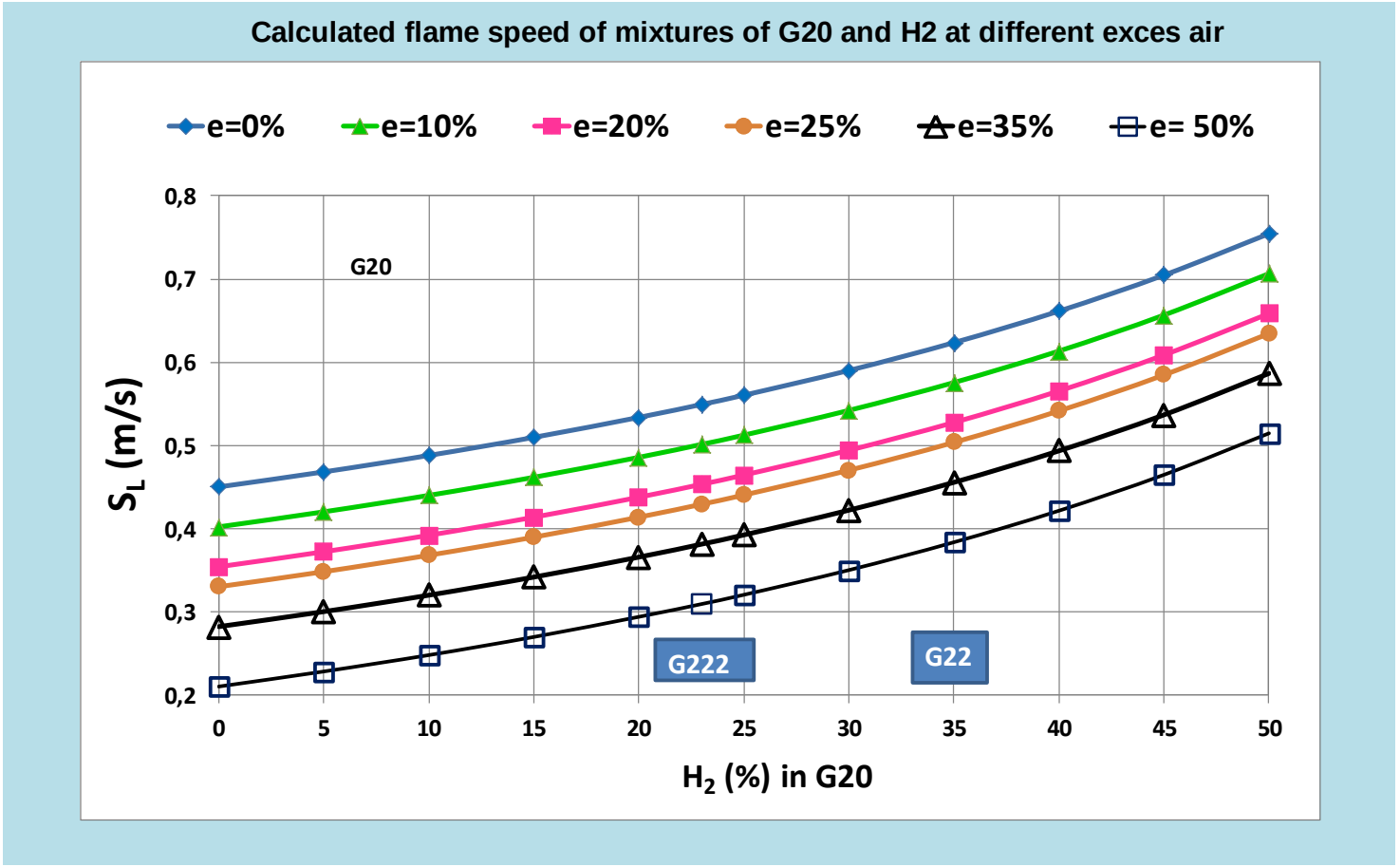
Impact of hydrogen

- Few manufactured gases contain more than 50 H_2
- They contain also nitrogen N_2
  - **N_2 reduces the flame speed and consequently the flash back**

Gas	CH_4	H_2	N_2	Total	Cat	Country
G110	26	50	24	100	1a	DK/IT/SE
G112	17	59	24	100		
G120	32	47	21	100	1b	SE
G140	26,4	43,1	30,5	100	1e	DE,SE
G141	27,5	46,3	26,2	100		
G142	17,2	51	31,8	100		

Impact of hydrogen

- The addition of H_2 to the gas modifies the combustion characteristics
  - **Flame stability ➔ flach back**
  - **Flame speed**
  - **Performances**
  - **Emissions**
  - **…**



Impact of hydrogen on test gases

- A new revision of NF 437 in 2 steps was adopted by the plenary CEN TC 238 in 2019 and 2020

- Step 1 : mixtures of natural gases and hydrogen to launched as soon as version 2021 is published
  - **The work of CEN TC 238 is done in parallel with CEN TC 109**

- Step 2 : hydrogen to launched as soon as version 2021 is published

- **Work progress will presented by CEN TC 109**

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