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Optivortek®_ Corner burners

Burner design.

Optivortek® is designed according with main swirling flame theory in order to guarantee a stable flame at all power input. Burner geometry is optimized basing on the result of CFD analisys an testing using Mevas test bench. Optivortek® has an improved performance in terms of durability, rangeability and pollutants emissions. The burner is characterised by a special design solution in order to avoid peak temperature into combustion chamber. Burner refractory blocks can be factory installed for all burners models. A stainless steel wrapper extension is supplied standard with factory installed refractory.

Low emissions and high efficiency.

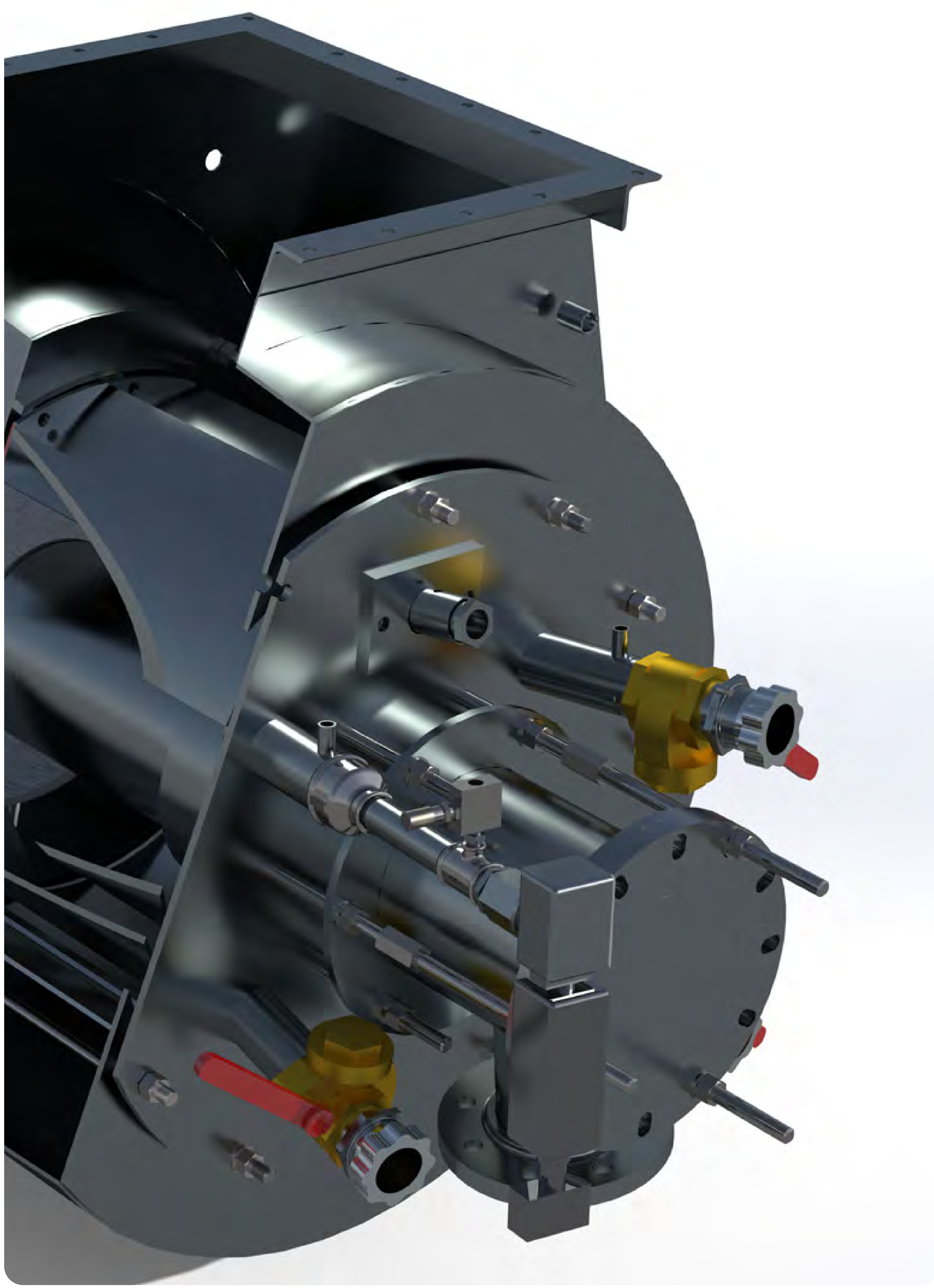
Burners are nozzle-mixing gas burners for many industrial direct-fired applications where clean combustion and high turndown are required.
They are simple and versatile for use on a variety of heating applications. This natural gas burner provides clean combustion with low NOx levels while providing unmatched turndown. Gas Burners provide outstanding performance in ovens and dryers, paint finishing lines, paper and textile machines, food baking ovens, grain dryers, and fume incinerators.

Operating range.

Optivortek® is the right choice for your new equipment or retrofitting application:

- High turndown capabilities on a wide range of fuels result from the stable flame produced by the air swirl rate
- Clean, smoke-free combustion results from the unique "vortex generator" which vaporizes fuel oils.
- Low NOx and CO emissions.
- Operates with low excess air for maximum efficiency or high excess air for high volume process air heating.

Consider also that Optivortek® burners are available as packaged units including valve trains, combustion air blowers, flame supervision and controls.



Description	Model					
	Op16	Op27	Op45	Op60	Op85	Op105
Max Input [kW]	1600	2750	4500	6000	8500	10500
Gas Inlet Pressure [mBar]	59	59	59	59	59	59
Air Inlet Pressure [mBar]	15	19	19	19	19	19
Combustion Air Flow [m3/h]	2280	3360	6480	8820	12240	16080
Typical Excess Air at Maximum Power	20 %					
Natual Gas Flow [m3/h]	169	296	479	649	903	1185
Flame Length [m]	2	2,2	2,5	2,8	3,4	3,8
Comb. Air Max Temp. [°C]	210 °C					
Max Outlet Temp. [°C]	1200 °C					
Burner Out Diameter [mm]	280	280	330	390	460	520

- All inputs based on standard conditions; 1 atmosphere, 21°C.
- All inputs based upon net calorific values (LHV).
- Mevas reserves the right to change the construction and/or configuration of our products at any time without being obliged to adjust earlier supplies accordingly.
- Maximum power is referred to combustion air temperature on standard condition, contact Mevas for burner sizing and recommendations for preheated air over 160° C.
- Burner minimum inputs stated for modulating combustion air.
- Air and natural gas pressure drops should be taken as a differential pressure between the air/gas at the burner and the chamber pressure.

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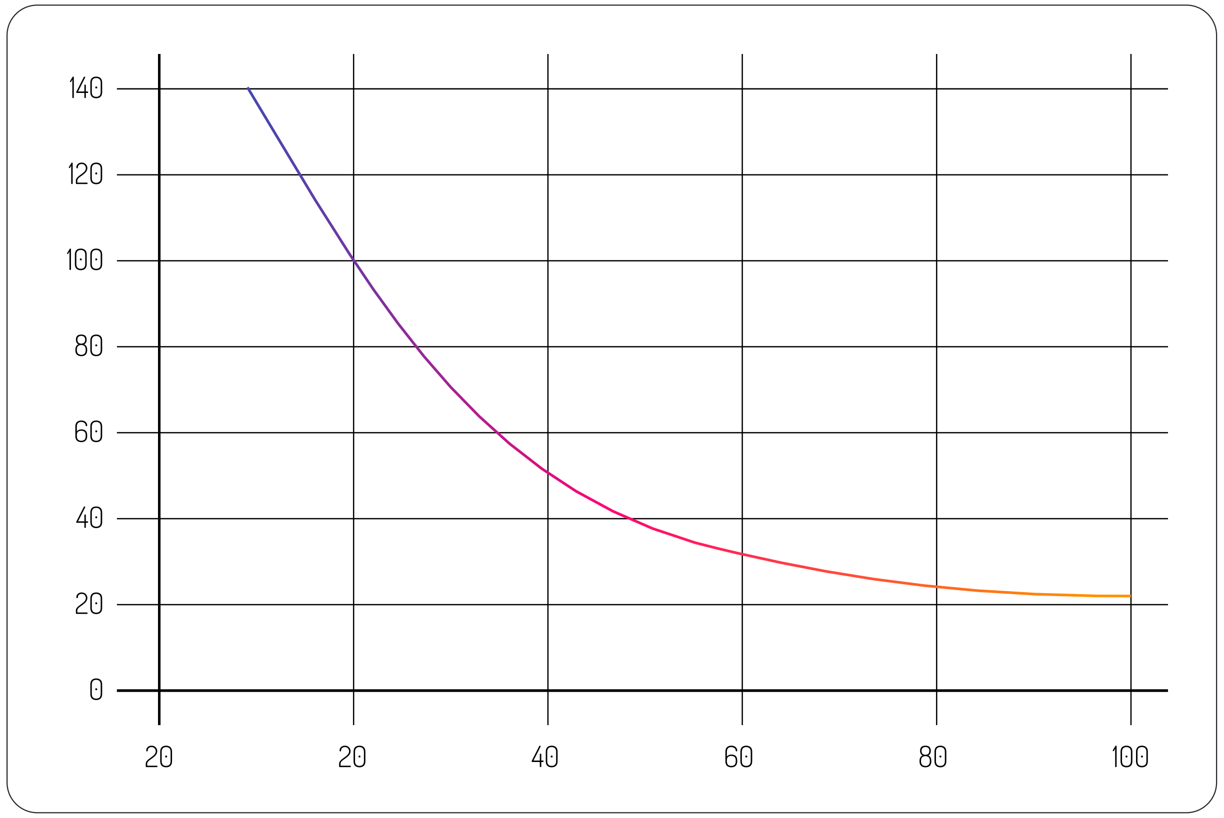
Performance graphs

Air Excess [%] vs. Burner Power [%]



Equation for the calculation of typical air excess [%] as function of burner power [%] is:

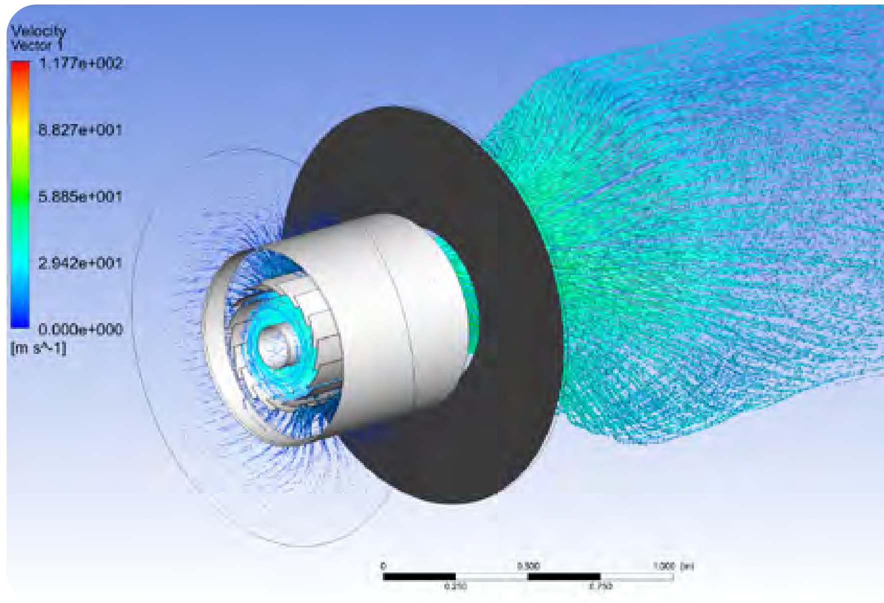
Air Excess= $10^{-7}\,Q_{\%}^{5} - 4\cdot10^{-5}\,Q_{\%}^{5} + 0{,}0035\,Q_{\%}^{3} - 0{,}117\,Q_{\%}^{2} - 1{,}6\,Q_{\%} + 155$

$Q_{\%}$ = Burner power in percentage

Testing and validation.

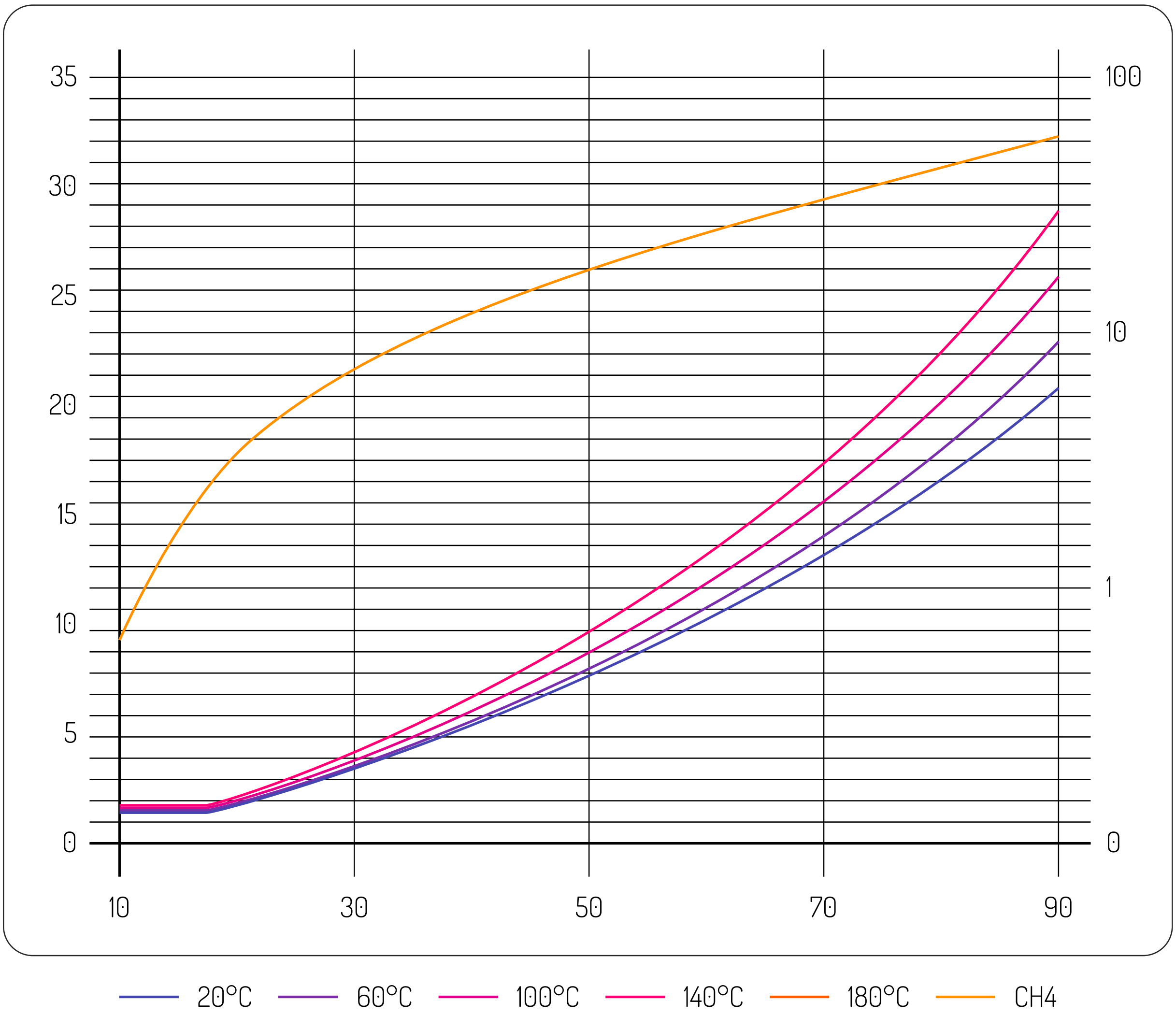
All combustion equipment design by Mevas is validated through CFD analisys (thermofluid + chemical) supported by our workshop test bench that allows us to test following equipments:

- Stratoflame® burner
- Optivortek® burner
- Corner combustion chamber (Ducts+Burner)



Performance Graphs

Combustion Pressure Drop [mBar] vs. Burner Power [%]
Gas Pressure Drop [mBar] vs. Burner Power [%]
Operation in air excess 20% at each power rate



Equation for the calculation of Gas pressure drop [mBar] as function of burner power [%] is: FOR Op16:

$\Delta P_{CH4} = 0{,}0015\ Q_{\%}^{2}$

For other models:

$\Delta P_{CH4} = 0{,}0015\ Q_{\%}^{2}$

$Q_{\%}$ = burner power in percentage

Equation for the calculation of the combustion air pressure [mBar] as function of burner power [%], valid from 20 to 100% is (air excess fixed to 20% at each power rate):

$\Delta P_{com.air} = Q_{\%}^{2} \cdot 6{,}53 \cdot 10^{-6}\ (273 + T_{com.air})$

$T_{com.air}$ = Combustion air temperature [°C]