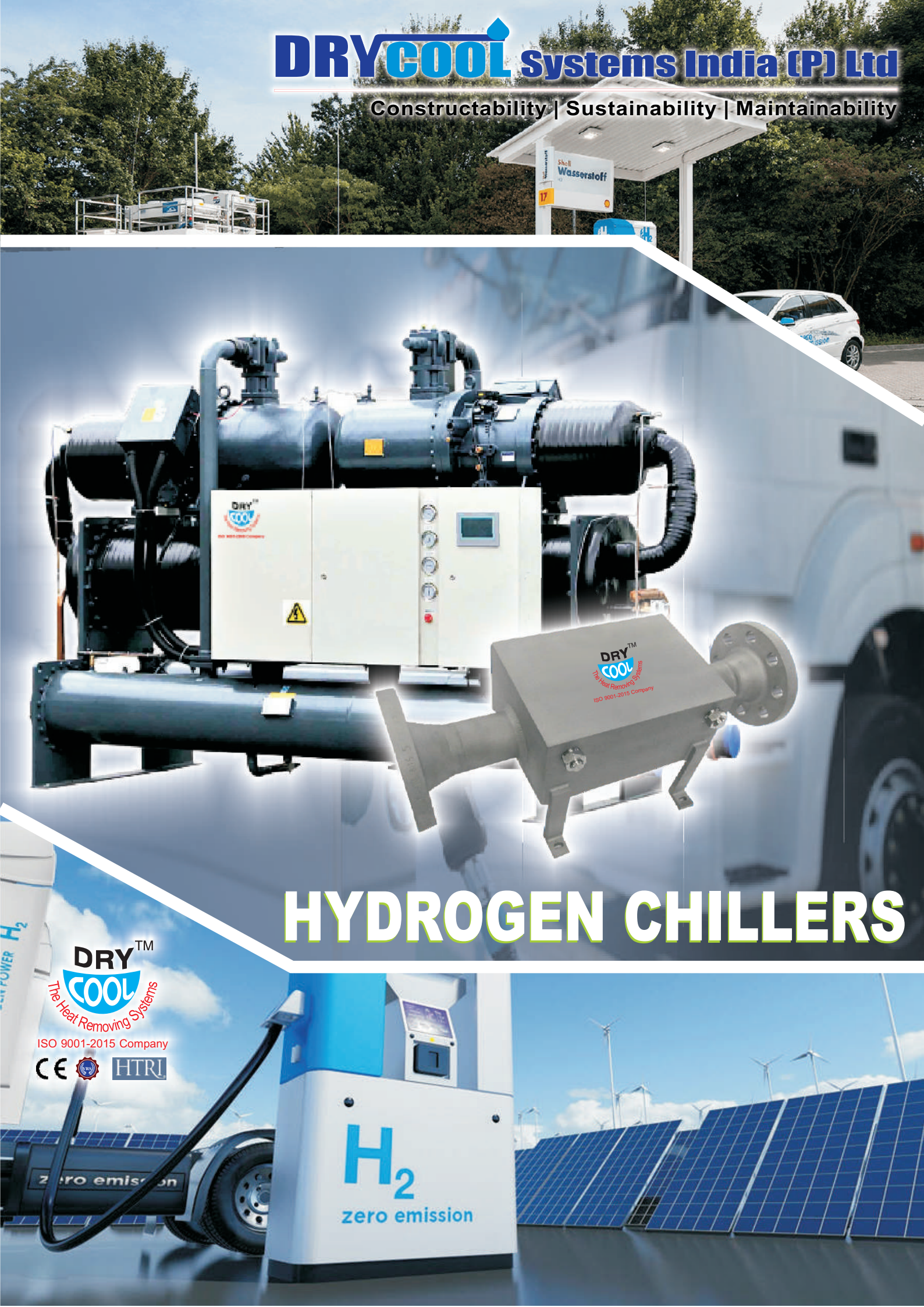




HYDROGEN CHILLERS



ISO 9001-2015 Company



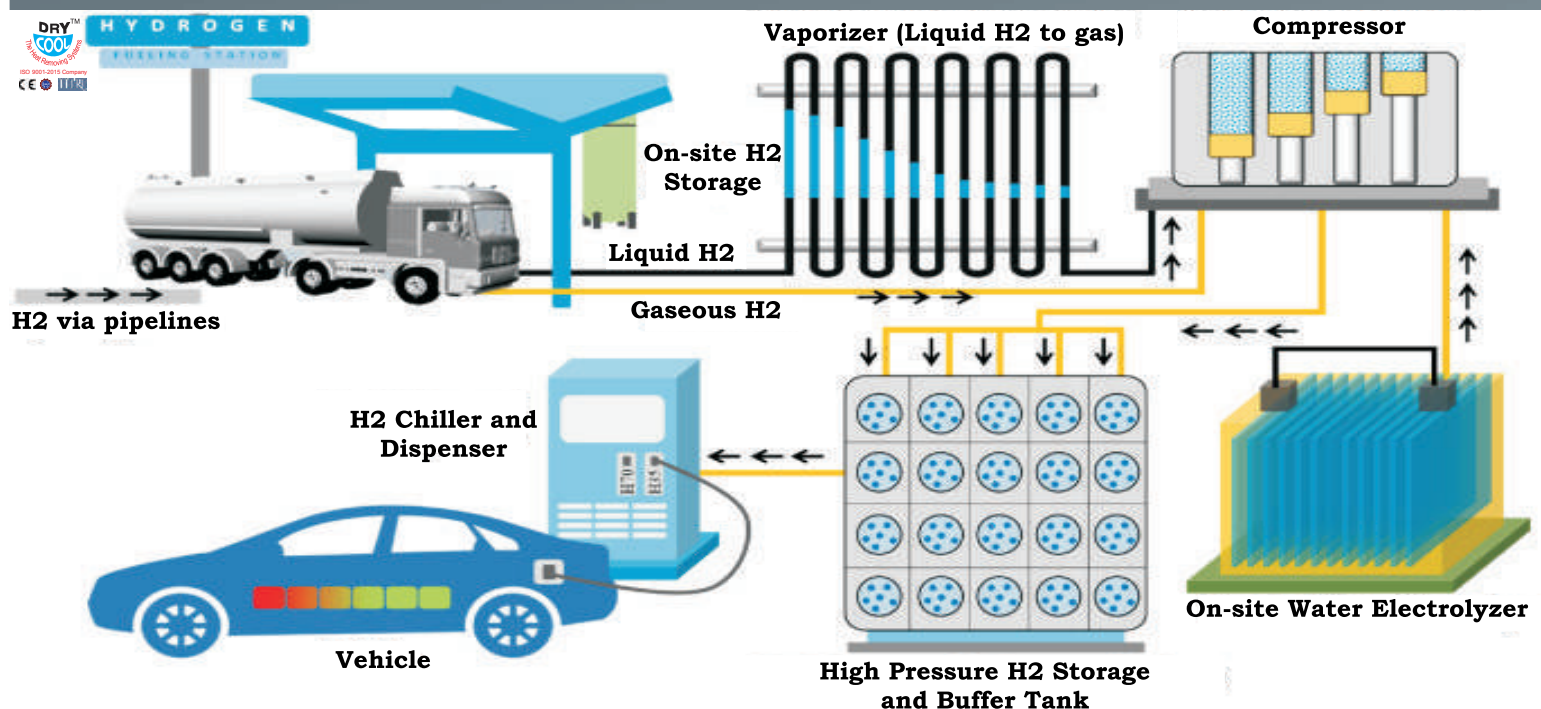
H2 Automotive Hydrogen Fuel Cell Refueling Station Chillers / Pre-Cooling Heat Exchanger Applications:

DRYCOOL chillers are used for hydrogen pre-cooling in automotive hydrogen refueling station applications for Hydrogen Fuel Cell Electric Vehicles.

With our DHC series of low temperature chiller systems, **DRYCOOL** provides the largest cooling capacities below -40°C available anywhere, which makes them an excellent choice for Hydrogen Refueling Station Applications!

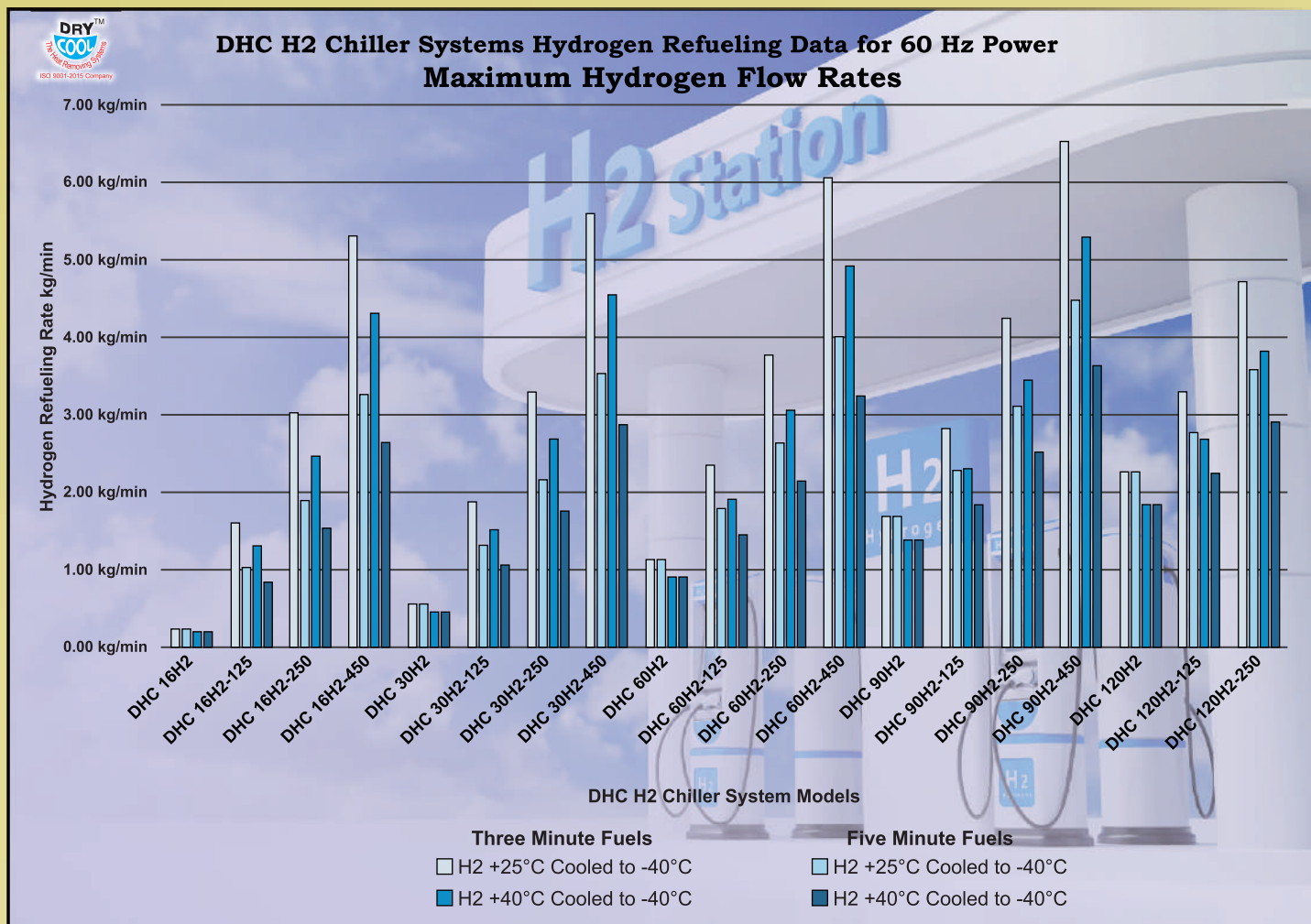
Our DHC H2 systems are designed specifically for hydrogen refueling applications as these systems utilize our DHC low temperature chiller system for cooling, and we offer a selection of optional large reservoir/pump modules to provide a cooling buffer and allow reduced wait time between re-fuels. The chiller system cools the Syltherm Heat Transfer Fluid in the reservoir, and the Syltherm is recirculated from the reservoir to the H2 pre-cooler heat exchanger when H2 dispensing is in progress.

DRYCOOL also offers Hydrogen Pre-Cooler Heat Exchanger solutions developed to work with our DHC H2 Chiller Systems. Our Hydrogen Precooler Heat exchangers are very compact MCHE Micro Channel Diffusion Bonded Stainless Steel designs that can operate at very low temperatures and very high pressures.



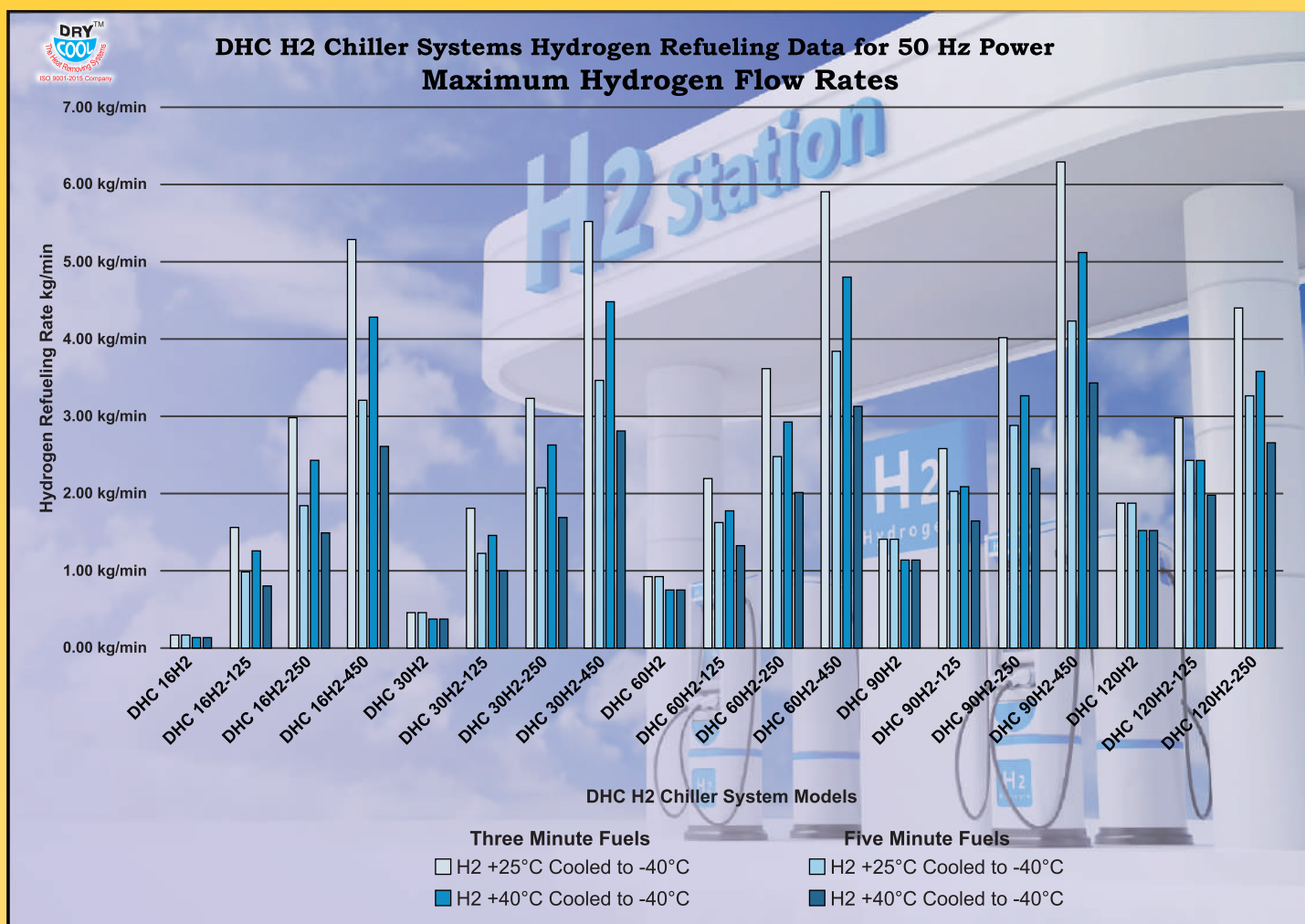
DHC H2 Chiller Systems Hydrogen Refueling Data for 60 Hz Power

DRYCOOL H2 Chiller Model	+25°C H2 starting temp. cooled to -40°C						+40°C H2 starting temp. cooled to -40°C					
	3 min fill			5 min fill			3 min fill			5 min fill		
	1 Fuel	2 Fuel	3 Fuel	1 Fuel	2 Fuel	3 Fuel	1 Fuel	2 Fuel	3 Fuel	1 Fuel	2 Fuel	3 Fuel
DHC 16H2	0.24 kg/min						0.20 kg/min					
DHC 16H2-125	1.61 kg/min	0.90 kg/min	0.66 kg/min	1.04 kg/min	0.62 kg/min	0.47 kg/min	1.31 kg/min	0.73 kg/min	0.54 kg/min	0.85 kg/min	0.50 kg/min	0.38 kg/min
DHC 16H2-250	3.04 kg/min	1.61 kg/min	1.14 kg/min	1.90 kg/min	1.04 kg/min	0.76 kg/min	2.47 kg/min	1.31 kg/min	0.92 kg/min	1.54 kg/min	0.85 kg/min	0.61 kg/min
DHC 16H2-450	5.32 kg/min	2.75 kg/min	1.90 kg/min	3.27 kg/min	1.73 kg/min	1.21 kg/min	4.32 kg/min	2.24 kg/min	1.54 kg/min	2.65 kg/min	1.40 kg/min	0.98 kg/min
DHC 30H2	0.57 kg/min						0.46 kg/min					
DHC 30H2-125	1.89 kg/min	1.18 kg/min	0.94 kg/min	1.32 kg/min	0.90 kg/min	0.76 kg/min	1.53 kg/min	0.96 kg/min	0.76 kg/min	1.07 kg/min	0.73 kg/min	0.61 kg/min
DHC 30H2-250	3.31 kg/min	1.89 kg/min	1.41 kg/min	2.12 kg/min	1.32 kg/min	1.04 kg/min	2.69 kg/min	1.53 kg/min	1.15 kg/min	1.77 kg/min	1.07 kg/min	0.84 kg/min
DHC 30H2-450	5.60 kg/min	3.03 kg/min	2.17 kg/min	3.54 kg/min	2.00 kg/min	1.49 kg/min	4.55 kg/min	2.46 kg/min	1.77 kg/min	2.88 kg/min	1.63 kg/min	1.21 kg/min
DHC 60H2	1.13 kg/min						0.92 kg/min					
DHC 60H2-125	2.36 kg/min	1.66 kg/min	1.43 kg/min	1.79 kg/min	1.38 kg/min	1.26 kg/min	1.91 kg/min	1.35 kg/min	1.16 kg/min	1.46 kg/min	1.12 kg/min	1.02 kg/min
DHC 60H2-250	3.78 kg/min	2.36 kg/min	1.89 kg/min	2.64 kg/min	1.80 kg/min	1.52 kg/min	3.07 kg/min	1.92 kg/min	1.53 kg/min	2.15 kg/min	1.46 kg/min	1.23 kg/min
DHC 60H2-450	6.06 kg/min	3.50 kg/min	2.65 kg/min	4.01 kg/min	2.47 kg/min	1.97 kg/min	4.93 kg/min	2.84 kg/min	2.15 kg/min	3.26 kg/min	2.01 kg/min	1.60 kg/min
DHC 90H2	1.70 kg/min						1.38 kg/min					
DHC 90H2-125	2.83 kg/min	2.14 kg/min	1.93 kg/min	2.28 kg/min	1.89 kg/min	1.78 kg/min	2.30 kg/min	1.74 kg/min	1.57 kg/min	1.85 kg/min	1.53 kg/min	1.44 kg/min
DHC 90H2-250	4.25 kg/min	2.84 kg/min	2.37 kg/min	3.12 kg/min	2.28 kg/min	2.01 kg/min	3.45 kg/min	2.30 kg/min	1.93 kg/min	2.53 kg/min	1.85 kg/min	1.63 kg/min
DHC 90H2-450	6.53 kg/min	3.97 kg/min	3.12 kg/min	4.48 kg/min	2.95 kg/min	2.45 kg/min	5.30 kg/min	3.22 kg/min	2.53 kg/min	3.64 kg/min	2.40 kg/min	1.99 kg/min
DHC 120H2	2.27 kg/min						1.85 kg/min					
DHC 120H2-125	3.31 kg/min	2.64 kg/min	2.44 kg/min	2.77 kg/min	2.41 kg/min	2.32 kg/min	2.70 kg/min	2.15 kg/min	1.98 kg/min	2.25 kg/min	1.95 kg/min	1.88 kg/min
DHC 120H2-250	4.73 kg/min	3.32 kg/min	2.86 kg/min	3.59 kg/min	2.77 kg/min	2.52 kg/min	3.83 kg/min	2.70 kg/min	2.32 kg/min	2.92 kg/min	2.25 kg/min	2.05 kg/min



DHC H2 Chiller Systems Hydrogen Refueling Data for 50 Hz Power

DRYCOOL H2 Chiller Model	DHC H2 Chiller Systems Hydrogen Refueling Data for 50 Hz Power Maximum Hydrogen Flow Rates											
	+25°C H2 starting temp. cooled to -40°C						+40°C H2 starting temp. cooled to -40°C					
	3 min fill			5 min fill			3 min fill			5 min fill		
	1 Fuel	2 Fuel	3 Fuel	1 Fuel	2 Fuel	3 Fuel	1 Fuel	2 Fuel	3 Fuel	1 Fuel	2 Fuel	3 Fuel
DHC 16H2	0.19 kg/min						0.15 kg/min					
DHC 16H2-125	1.57 kg/min	0.85 kg/min	0.62 kg/min	1.00 kg/min	0.57 kg/min	0.43 kg/min	1.27 kg/min	0.69 kg/min	0.50 kg/min	0.81 kg/min	0.46 kg/min	0.35 kg/min
DHC 16H2-250	2.99 kg/min	1.57 kg/min	1.09 kg/min	1.85 kg/min	1.00 kg/min	0.71 kg/min	2.43 kg/min	1.27 kg/min	0.89 kg/min	1.50 kg/min	0.81 kg/min	0.58 kg/min
DHC 16H2-450	5.28 kg/min	2.71 kg/min	1.85 kg/min	3.22 kg/min	1.68 kg/min	1.17 kg/min	4.29 kg/min	2.20 kg/min	1.50 kg/min	2.62 kg/min	1.37 kg/min	0.95 kg/min
DHC 30H2	0.47 kg/min						0.38 kg/min					
DHC 30H2-125	1.81 kg/min	1.10 kg/min	0.86 kg/min	1.24 kg/min	0.81 kg/min	0.67 kg/min	1.47 kg/min	0.89 kg/min	0.70 kg/min	1.01 kg/min	0.66 kg/min	0.55 kg/min
DHC 30H2-250	3.24 kg/min	1.81 kg/min	1.33 kg/min	2.09 kg/min	1.24 kg/min	0.96 kg/min	2.63 kg/min	1.47 kg/min	1.08 kg/min	1.70 kg/min	1.01 kg/min	0.78 kg/min
DHC 30H2-450	5.52 kg/min	2.95 kg/min	2.10 kg/min	3.46 kg/min	1.92 kg/min	1.41 kg/min	4.48 kg/min	2.40 kg/min	1.70 kg/min	2.81 kg/min	1.56 kg/min	1.15 kg/min
DHC 60H2	0.94 kg/min						0.76 kg/min					
DHC 60H2-125	2.20 kg/min	1.49 kg/min	1.26 kg/min	1.63 kg/min	1.22 kg/min	1.08 kg/min	1.79 kg/min	1.21 kg/min	1.02 kg/min	1.33 kg/min	0.99 kg/min	0.88 kg/min
DHC 60H2-250	3.62 kg/min	2.20 kg/min	1.73 kg/min	2.48 kg/min	1.63 kg/min	1.35 kg/min	2.94 kg/min	1.79 kg/min	1.40 kg/min	2.02 kg/min	1.33 kg/min	1.10 kg/min
DHC 60H2-450	5.90 kg/min	3.34 kg/min	2.48 kg/min	3.85 kg/min	2.31 kg/min	1.80 kg/min	4.80 kg/min	2.71 kg/min	2.02 kg/min	3.13 kg/min	1.88 kg/min	1.46 kg/min
DHC 90H2	1.41 kg/min						1.15 kg/min					
DHC 90H2-125	2.59 kg/min	1.90 kg/min	1.67 kg/min	2.03 kg/min	1.63 kg/min	1.51 kg/min	2.10 kg/min	1.54 kg/min	1.36 kg/min	1.65 kg/min	1.32 kg/min	1.23 kg/min
DHC 90H2-250	4.01 kg/min	2.59 kg/min	2.13 kg/min	2.88 kg/min	2.03 kg/min	1.76 kg/min	3.26 kg/min	2.11 kg/min	1.73 kg/min	2.34 kg/min	1.65 kg/min	1.43 kg/min
DHC 90H2-450	6.29 kg/min	3.73 kg/min	2.88 kg/min	4.24 kg/min	2.71 kg/min	2.20 kg/min	5.11 kg/min	3.03 kg/min	2.34 kg/min	3.44 kg/min	2.20 kg/min	1.79 kg/min
DHC 120H2	1.89 kg/min						1.53 kg/min					
DHC 120H2-125	2.99 kg/min	2.30 kg/min	2.09 kg/min	2.44 kg/min	2.05 kg/min	1.95 kg/min	2.43 kg/min	1.87 kg/min	1.70 kg/min	1.98 kg/min	1.67 kg/min	1.58 kg/min
DHC 120H2-250	4.40 kg/min	2.99 kg/min	2.53 kg/min	3.27 kg/min	2.44 kg/min	2.17 kg/min	3.58 kg/min	2.43 kg/min	2.05 kg/min	2.66 kg/min	1.98 kg/min	1.77 kg/min



DRYCOOL Stainless Steel Diffusion Bonded Microchannel Heat Exchanger Hydrogen Pre-Coolers

 Stainless Steel Diffusion Bonded Micro Channel Heat Exchanger Hydrogen Pre-Coolers	
DRYCOOL MH2HE-1	DRYCOOL MH2HE-2
31 Kw Duty	76 Kw Duty
1.67 kg/min avg. Hydrogen Flow	3.60 kg/min avg. Hydrogen Flow
+40°C Hydrogen Entering Temp	+40°C Hydrogen Entering Temp
-40°C Hydrogen Exiting Temp	-40°C Hydrogen Exiting Temp
30 GPM Coolant Flow Rate	30 GPM Coolant Flow Rate
-50°C Coolant Temp	-50°C Coolant Temp
SS 316/316L Construction	SS 316/316L Construction
1000 MAWP (barg)	1000 MAWP (barg)
Core Size : 260mm (L) x 128mm (W) x 178mm (H)	Core Size : 260mm (L) x 128mm (W) x 178mm (H)
Material procurement and inspection in accordance with ASME II Part D	
Assembly and high vacuum diffusion bonding of cores, reference ASME VIII Div 1 Mandatory Appendix 42	
GTAW and GMAW attachment of manifolds, nozzles and flanges, reference ASME VIII Div1	
NDE Examination, reference ASME VIII Div 1 Mandatory Appendix 42	
CE PED testing/certification available at additional cost	
Designed for use with DHC-H2 Series low temperature Chiller Systems	

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