

NITROGEN ENGINEERS

AMMONIA CRACKER

INTRODUCTION

Anhydrous liquid ammonia is an interesting carrier of Hydrogen gas, it is non-flammable, is readily obtained and handled in liquid form. The energy density of ammonia is 3.3 kWh/kg. Therefore liquid anhydrous ammonia is an excellent storage medium for hydrogen.

Dissociated ammonia is a dry, reducing, oxygen free gas mixture with a composition of 75% hydrogen and 25% nitrogen, by volume. It is a gas with considerable reducing constituents, low dew point, virtually no impurities and thus capable of preventing oxidation of the most vulnerable material at elevated temperatures, such as stainless steel.

PROCESS

Vapor ammonia drawn from ammonia cylinder / bulk ammonia storage tanks through pressure regulating / filtration / desulphurising unit dissociates into 75% hydrogen & 25% nitrogen, when it is passed over at high temperature on noble metal, nickel. The chemical reaction kinetics are accelerated by nickel, following is the thermodynamic equilibrium.



EQUIPMENT

NITROGEN ENGINEERS Ammonia dissociator will comprise of an electric heated / fuel fired, ceramic fiber insulated furnace which holds a retort / set of retorts & is filled with nickel catalyst. When subjected to higher temperature (900°C & above), ammonia dissociates into 75% hydrogen & 25% nitrogen.

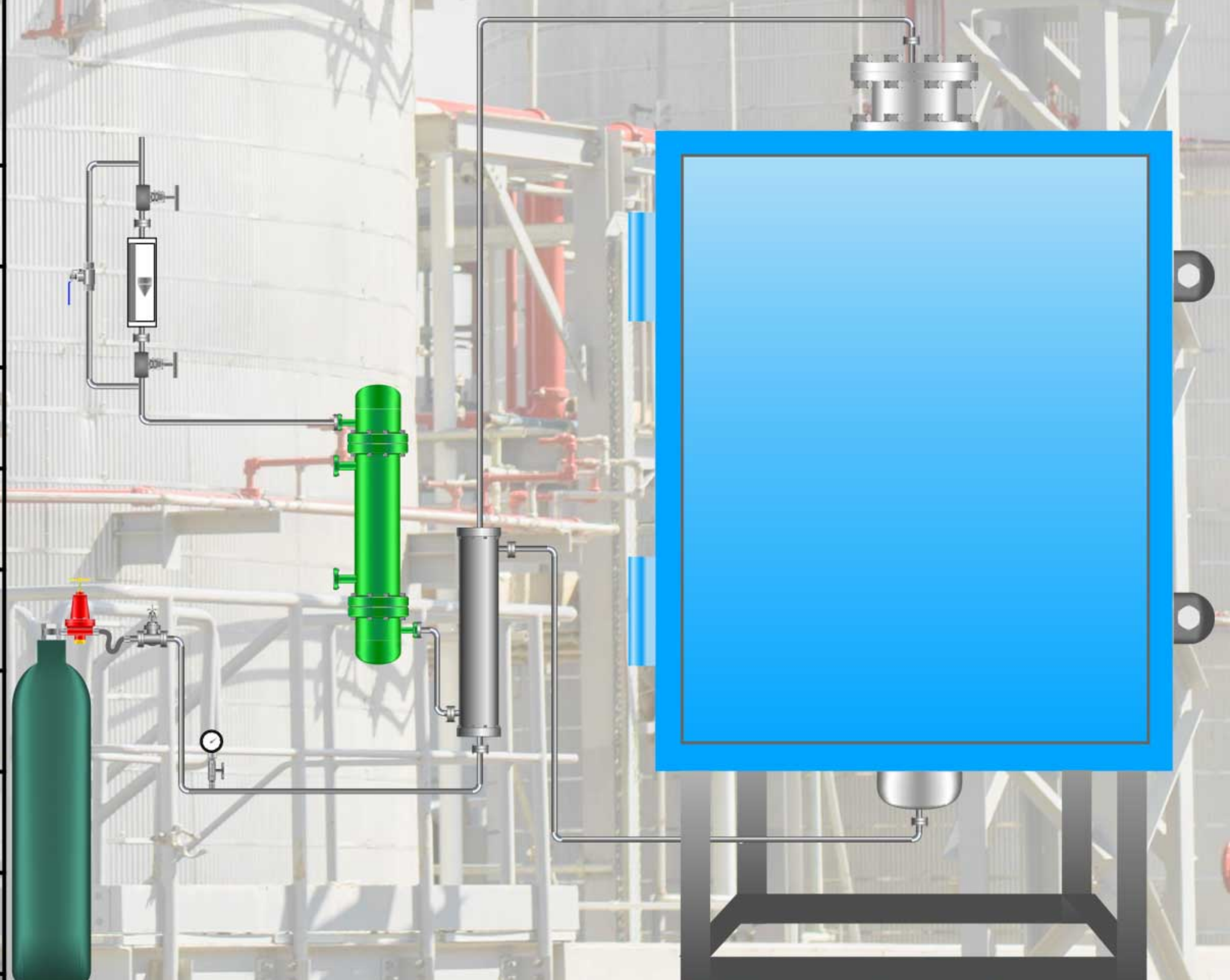
Traces of un-cracked ammonia / moisture present can be eliminated in a downstream desiccant based automatic / manual operated, internal heat

GAS COMPOSITION

	WITHOUT PURIFIER	WITH PURIFIER
HYDROGEN	75%	75%
NITROGEN	25%	25%
OXYGEN	NIL	NIL
RESIDUAL AMMONIA	<100 PPM	<1 PPM
DEW POINT	(-) 22°C	UPTO (-) 80°C

OPERATIONAL DATA

CAPACITY NM ³ /Hr	AMMONIA CONSUMPTION Kg/Hr	ELECTRIC POWER CONSUMPTION KW/Hr
5	1.9	5.0
7.5	2.9	7.5
10	3.8	10.0
15	5.7	15.0
25	9.5	25.0
40	15.2	40.0
50	19	50.0
75	28.5	75.0
100	38	100.0



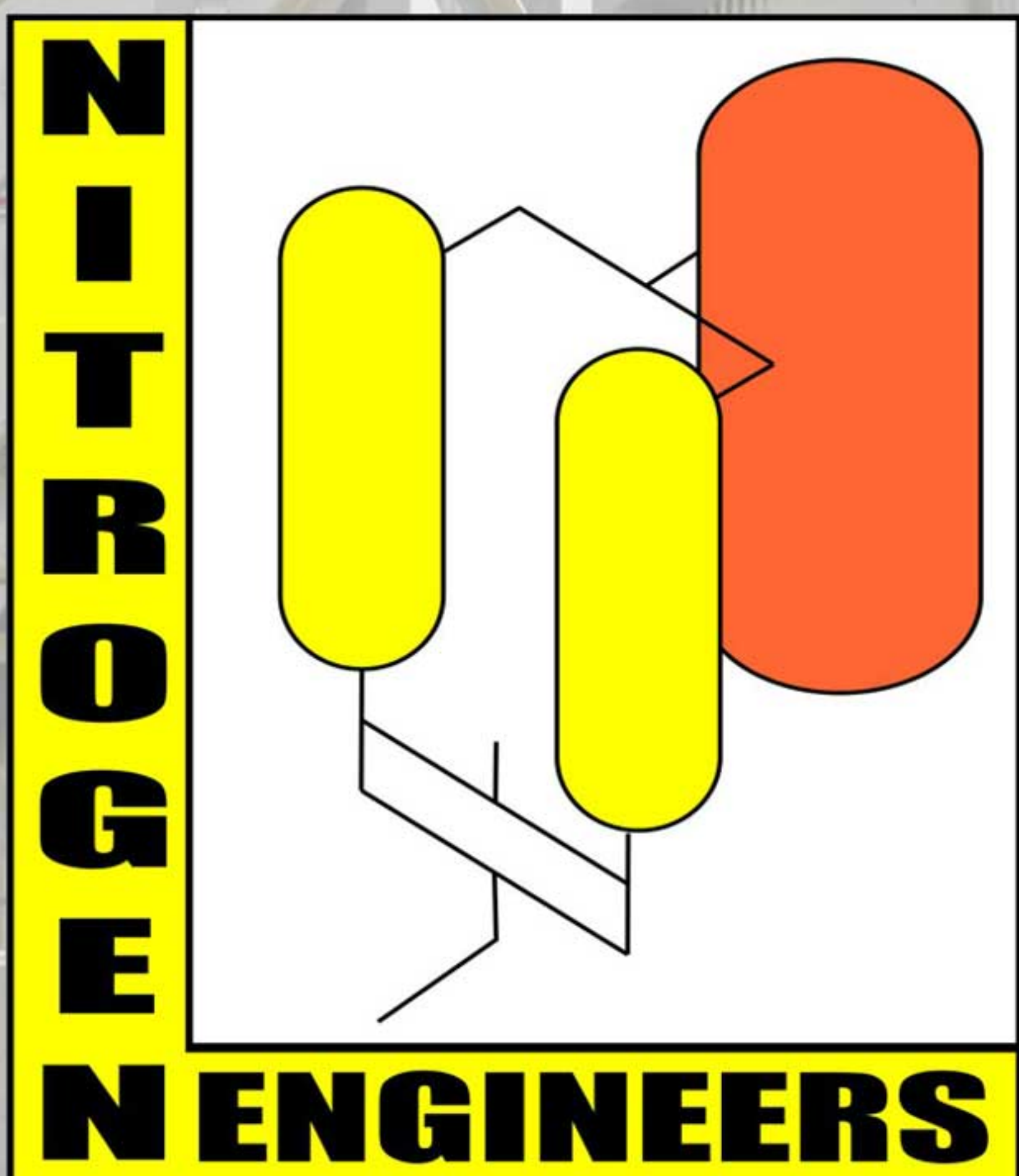
Typical Schematic of Ammonia Cracker

SALIENT FEATURES OF OUR AMMONIA CRACKER

Stationary equipment, least maintenance
Electric/LPG heated furnace
Ceramic fiber lined Heating elements low watts density,
insures long life
Start up time as low as 50-60 minutes.
Easy to Operate inspection door.
High operating pressure - available
Centrifugal cast retorts.
Energy source - electric or gas heated
Compact, lightweight, fully automatic,
Pre piped, ready to commission skid mounted units.

APPLICATIONS

Continuous galvanizing lines
Continuous annealing lines
Anneal & pickle lines Brazing
Bright annealing lines
Batch annealing facilities
Powder annealing
Sintering furnaces
Tube, pipe & bar heat treating
Wire processing
De-oxo reactors
Hydrogenation



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Office

16/3, Jay-Vijay Industrial Estate,
Mumbai- Ahmedabad Highway, Bapane,
Naigaon - 401 208, Thane

Contact : +91-9323383550 / 7738072611
email : nitrogen.engineers@gmail.com
info@nitrogenengineers.com



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9323383550

www.nitrogenengineers.com