

Document	Technical Bulletin 018
Date	24: 11: 95
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Liquip “Dry Break” Couplings

[For interest it should be noted that the term “Dry Break” has been internationally copyrighted by the Emco Wheaton organisation as a trade mark]

Liquip have at their disposal a range of “dry disconnect” couplings and adaptors that fall into the following general categories.

A API Standard

B Industrial Standard

C Miscellaneous

When offering a “dry disconnect” system you should make careful consideration of the operating conditions and offer ***what is appropriate***.

Do not fall into the trap of offering what has been traditionally deemed as “correct”

An example of this, is, for instance quoting 4” TODO Industrial standard couplings against Emco and Gilbarco for an application which involved pump suction from an un-ground storage tank containing Jet A1.

We won the order by offering our own API400-A (which uses an industry accepted ASA150 flange) and our APIRC.

In this instance we were thousands of dollars cheaper than the opposition, the goods were ex-stock, and lighter to handle - Every one was happy - except the competition!

Ultimately the application will dictate what is appropriate.

- **In all cases find out all the relevant information - do not guess - it will be expensive if you make a mistake.**

Media details - Product, SG, pH, temperature, viscosity, flow rate

System - Operating pressure, maximum pressure, thermal relief?
Will coupling pressure be a problem?

Coupling - To what? - fully identify other adaptor or hose end unit

Materials - What are other materials and seals in system (for back up info)

Other - Selectivity required?, pressure relieving? (TODO)

A - API Standard.

- Liquip manufactured units -**
- API513** - Female tank truck loading coupling with interlock.
pressure rated to 1000 kpa (coupled)
(See technical bulletin regarding pressure rating)
Flanged 100 mm TTMA

 - APIRC** - Female tank truck unloading coupling
No interlock, pressure rated to 350 kpa (coupled)
1000 kpa product retention.
Screwed 100 mm BSPF

 - APINZ** - Female tank truck unloading coupling
No interlock, pressure rated to 350 kpa (coupled)
1000 kpa product retention.
90 degree version of APIRC
Screwed 80 mm BSPF

 - API400-M** - Male dry disconnect adaptor
Gold passivated cadmium plated SG iron with stainless steel shaft and viton seal.
Flanged ASA150 FF
Non operable - IE, No handle

 - API400-A** - Male dry disconnect adaptor
Aluminium construction, stainless steel shaft viton seal.
Flanged ASA150 FF
Non operable - IE, No handle

 - API 450 / 403B** - Male dry disconnect adaptor
Aluminium construction, stainless steel shaft viton seal.
Flanged 100 mm TTMA
Operable - IE, Has handle.

Suitable for traditional applications [tank truck / terminal / rail car] **and industrial applications** providing seals, pressure rating and materials of construction are suitable. NOTE: Sealing options.

The Competition

Domestically we see competition in this are from two suppliers - Treloar (OPW agent) and Emco Wheaton.

I would estimate that Liquip have 80% or more of all new loading arms and couplings supplied within Australia, and 90% of all replacement couplings supplied.

Liquip also offer a comprehensive, testing, repair and service facility for all API , industrial and other miscellaneous dry disconnect couplings. If Liquip API513 couplings are to be repaired in the field, please refer to our comprehensive service document.

Pay attention to the type of grease used. It must be solvent resistant grease.

Emco Wheaton Australia

Truck loading Coupler - J451, flanged 100 mm TTMA

Current list price - \$ 998.00 (less 10%)

Weight - 18.5 lb / 8.4 kg

Also note Emco offering a "new" coupling - with "claimed" single handed operation, "automatic" un-coupling (spring back as per Thiem F228 unit) and vacuum device to "suck back" product retention film from poppet face. - \$1,200.00 being offered for diesel arms

Treloar

Truck loading Coupler - 1004D, flanged 100 mm TTMA (supersedes 1004E)

Current list price - \$ 1135.00

Weight - 8.5 kg

Max Coupling pressure - 350 kpa

B Three Point Bayonet Industrial Standard

TODO Product range.

Hose end units and tank units 3/4" - 6"

Plus specials such as Aviation low point and high point drain units with pressure relieving poppets

Materials of Construction

Aluminium, 316 Stainless Steel, Gun metal, (SG Iron -specials only - forget it)

Sealing materials

Viton A, EDPM, EPR, Buna, Kalrez, plus specials.

Note: Teflon only used as flat seal in swivel

Pressure rating - General

Max working pressure - 10 bar, max coupling pressure - 7 bar.

Competitors

Gilbarco / GEC - Avery Hardoll

Emco Wheaton - Buck-eye

Interchangeability

All competing 3 point bayonet international standard units are interchangeable - ***Providing the correct size units are selected.***

Beware!

As a rule TODO and Avery Hardoll use similar terminology.

EG, A 3" Hose end coupling will have a 3" connection and a 3" DIN standard 3 point bayonet.

However there are specials - make sure you fully check.

(Note: 2" TODO is 2" BSPF [Or 2" NPTF] connection x 38 mm DIN standard 3 point bayonet.

The exception to the rule is Emco Wheaton Buck-eye!

They specify connection size [thread size / flange size]

It is normal for their DIN standard 3 point bayonet to be smaller than the thread size.

As per the TODO example above, There is no guaranteed hard and fast rule - do your home work!

See following details from previous "tech talk" no T002

Pricing Comparison - guide line only

Like us our competitors prices will depend on specification, quantity etc.

Note: TODO hose end units include a swivel - others don't

TODO Flanged units are pre-drilled ASA150 FF - others are blank

TODO Generally ex-stock Sydney (not specials) - others to order

Emco Wheaton Buckeye

Tank unit screwed 3" BSPF x 2.5" DIN standard three point international bayonet.
Aluminium / viton - J1302-097

List Price - \$ 335.00

Hose end unit as above - J1407-007

List Price - \$ 865.00

Note: no swivels on couplers - Current delivery four weeks.

Avery Hardoll

Tank unit screwed 2.5" BSPF x 2.5" DIN standard three point international bayonet.
Aluminium / viton - CCMY66-M3

List Price - \$ 406.00 (Flanged unit CCMY41M3- \$ 495.00 but not drilled)

Hose end unit as above - CCMY40-10

List Price - \$ 850.00

Hose end unit 3" BSPF x 3" DIN standard three point international bayonet
Aluminium / viton - CCM 4040

List Price - \$ 1139.00

note: no swivels on couplers

TODO

T5332C-1307 - \$ 1156.00 less 25%

T5331C-1107 - \$ 392.00 less 25%

Ex-stock Liquip Sydney

C Miscellaneous

Don't forget other dry disconnect systems that we have access to.

Banlaw - Mining, loco refuelling, earth moving, general industry,
truck fleet refuelling?

APC - Safety break away dry breaks - cryogenics, marine bunkering,
Fleet refuelling, loco refuelling, LPG, petroleum products
mining

EBW - Safety break away dry breaks - Service stations, fleet refuelling,
mining

In general - spot the opportunity, analyse the application and select a product which will best allow you to win the job.

If in doubt ask - don't jump in with both feet!

Liquip Dry Break Couplings

ref:T002

11 August 1993

Tech Talk No: **T002**
Product: **Todo - Dry Break Couplings**
Part Number:
Terminology: **3 Point Industrial Bayonet Flange**
Opposition: **Gilbarco (Avery-Hardoll)**
Emco Wheaton (Buckie)

Features

Todo	Avery Hardoll	Buckie
Viton trim standard	extra	extra
Flanges drilled std (tank units)	extra	4" only
Swivel std (couplings)	yes	N/A
Swivel serviced independently	integral	N/A
Increased BSP & flange site	no/no	yes/no
Aluminium units all aluminium	no	yes
Stainless steel full range	2 1/2 only	1 1/2" & 2 1/2"
Size range 1" to 4"	1 1/2 to 4"	1" to 4"
Handle std 1 1/2 unit	extra	N/A
Handle std 2 1/2" 3" & 4"	yes	yes
Identification tag all units	no	no
P/No - material, S/No, Trim		
Standard threads BSP	BSP	NPT
Standard flange ASA150	blank	4" TTMA, ASA150

Page (2) Size comparisons and materials
Page (3) Flow rates and pressure loss charts
Page (4) Bayonet flange size check

Note: Todo and Avery Hardoll size Bayonet x BSP flange, buckle size thread
eg; 2" Buckie is a 1 1/2 x 2" NPT
3" Buckie is a 2 1/2 x 3" NPT

There is no such thing as a two (2) inch dry break. Check size first, see flange details.

Note 2: Selectivity available on all units

Note 3: Buckie interlocks only when coupled and rotated to open valves, you must use handle. Handle interlock pin is critical if damage valve can be opened any time whether coupled or not.

Size Comparison Chart

Tank Units BSP	Todo	Avery Hardoll	Buckie
1" x 3/4"	yes	N/A	no
1" x 1"	yes	N/A	yes
1" x 1 1/4"	yes	N/A	no
1 1/2" x 1 1/2"	yes	yes	yes
1 1/2" x 2"	yes	no	yes
2 1/2" x 2 1/2"	yes	yes	no
2 1/2" x 3"	yes	no	yes
3" x 3"	yes	yes	no
3" x 4"	no	no	yes
4" x 4"	yes	yes	yes
6" x 6"	yes	no	no
Tank Units Flanged			
1 1/2" x 1 1/2"	yes	yes	no
1 1/2" x 2"	yes	no	no
2 1/2" x 2 1/2"	yes	yes	no
2 1/2" x 3"	yes	no	no
3" x 3"	yes	yes	no
3" x 4"	no	no	no
4" x 4"	yes	yes	yes
6" x 6"	yes	no	no
Couplings BSP			
1" x 3/4"	yes	N/A	no
1" x 1"	yes	N/A	yes
1" x 1 1/4"	yes	N/A	no
1 1/2" x 1 1/2"	yes	yes	yes
1 1/2" x 2"	yes	no	yes
2 1/2" x 2 1/2"	yes	yes	no
2 1/2" x 3"	yes	no	yes
3" x 3"	yes	yes	no
3" x 4"	no	no	yes
4" x 4"	yes	yes	yes
6" x 6"	yes	no	no

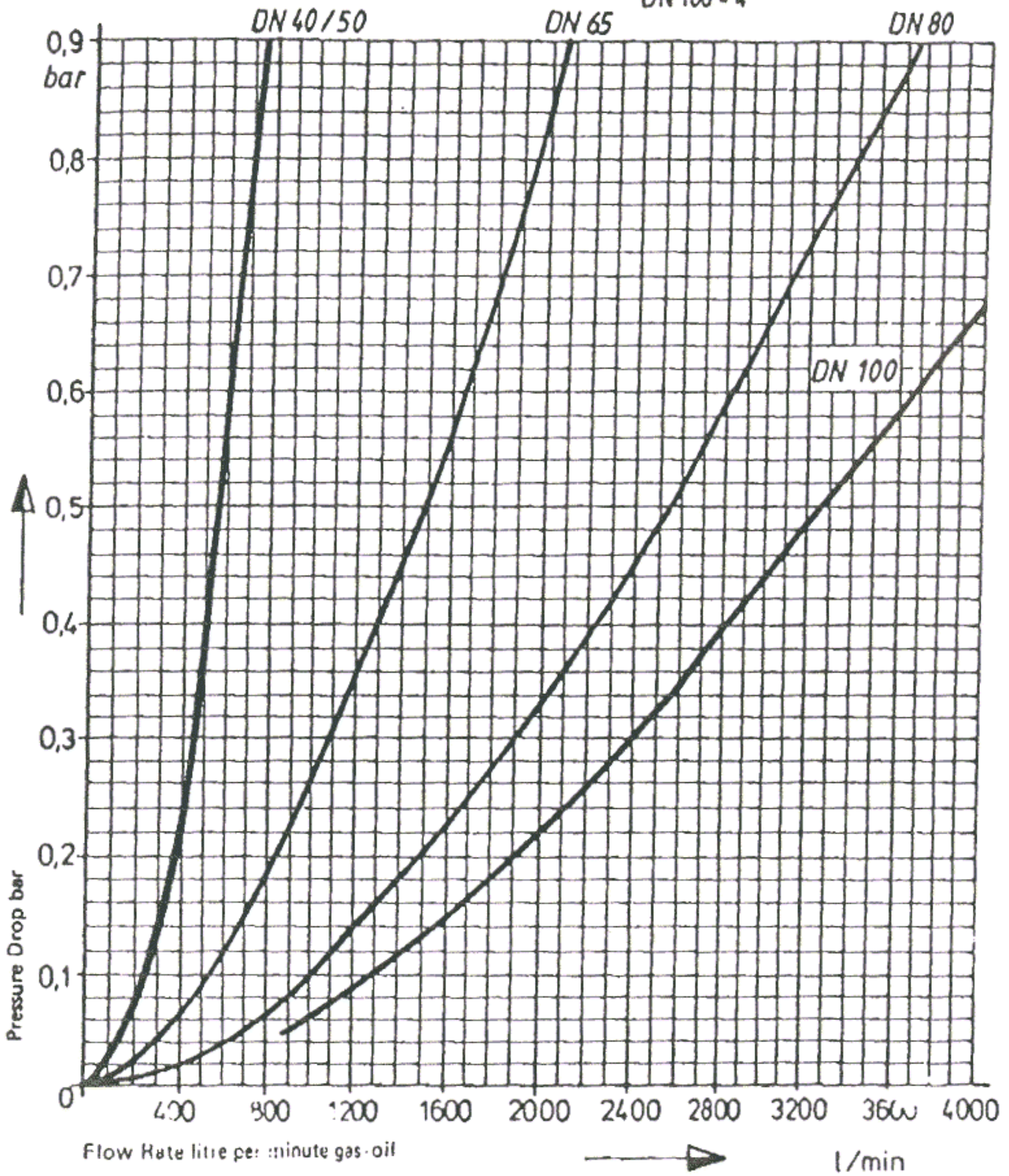
Materials

	Todo	Avery Hardoll	Buckie
Aluminium	yes	yes	yes
Gunmetal	yes	yes	no
Brass	no	no	yes
Stainless steel 3/6	yes	2 1/2 only	1 1/2 & 2 1/2
Special Iron	yes	no	yes
Viton A	yes	yes	yes
Buna	yes	yes	yes
EPDM	yes	yes	yes
EPR	yes	yes	yes
Teflon	no *	no *	no *
Kalrez	yes	no	no

(*) Tank unit yes, coupling NO

Testing Medium
Gravity by 16° C: 0,795
Viscosity by 16° C: 1° E

Pressure Drop
Dry Break Couplings
DN 40 = 1 1/2"; DN 20 = 2"
DN 65 = 2 1/2"; DN 80 = 3"
DN 100 = 4"



The hose unit comprises a cam operated self-sealing valve assembly, a fixed guide sleeve and a swivel hose connector.

The tank unit comprises a body with a self-sealing spring loaded valve.

Coupling operation is by a push and turn action which causes three rollers in the hose unit to engage with the tank unit, thus locking and sealing the two units together. Further rotation causes the hose unit valve to open, carrying the tank unit valve with it, thereby allowing flow to commence. The opening so formed gives smooth flow with minimum pressure drop.

On disconnection, the two valves fully close before the couplings separate and spillage is therefore negligible (a maximum of 2 cc.).

SELECTIVITY

To avoid product contamination caused by connecting a hose unit to a wrong tank unit, selective versions of the hose and tank units are available. Each unit has a number of selective positions, designated according to coupling size.

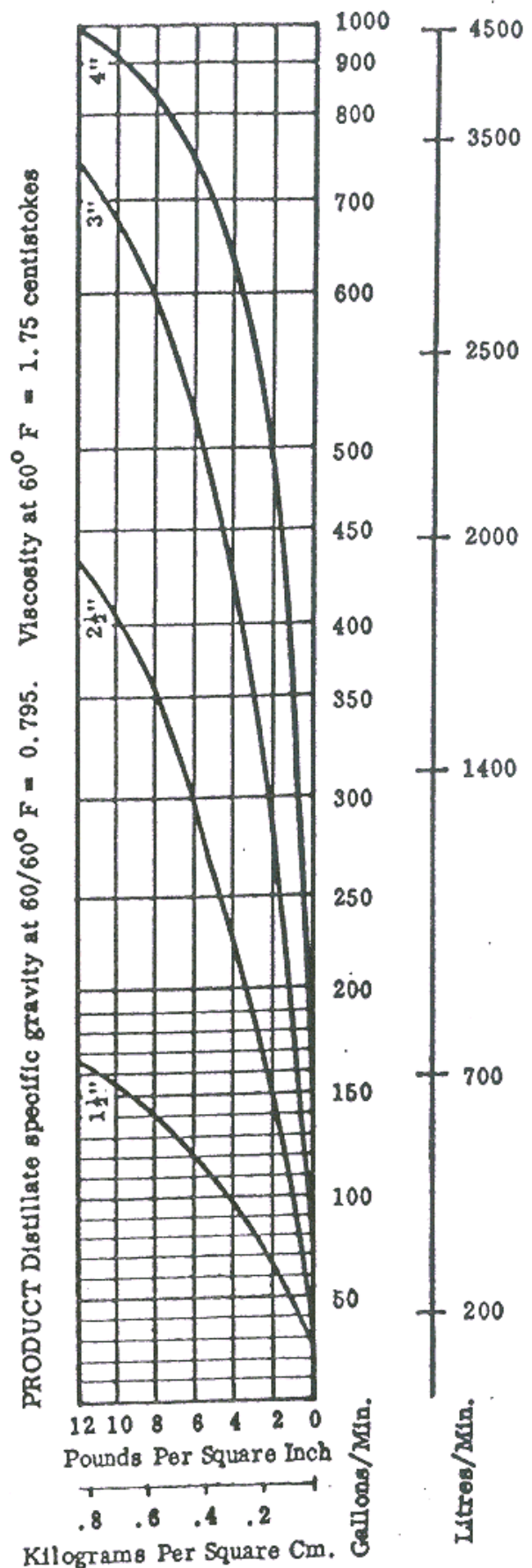
Table of selectivity positions

For aviation refuelling purposes, the following selectivity positions have been agreed by the major oil companies for the 2½", 3" and 4" sizes.

FUEL GRADE	* SEL. POS.
Avgas 100/130	1
Avgas 108/135	2
Avgas 115/145	3
Avtur (Derd 2494) JP1. ATK. ATF 650. Jet 'A'	4
Avtag (Derd 2486) JP4. ATG. Jet 'B'	5

* Must be specified on Order.

PRESSURE LOSS CURVES (Tank Unit coupled to Hose Unit)





DRY - BREAKS DIMENSIONAL CHARTS

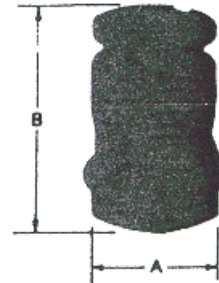
Wheaton



COUPLING VALVES

FIG. NO.	SIZE	A ¹	B
J-1400	25 mm	89 mm	93.6 mm
J-1401	37 mm	127.3 mm	171.4 mm
J-1401	50 mm	127.3 mm	171.4 mm
J-1407	75 mm	178 mm	273 mm
J-1410	100 mm	279 mm	279.7 mm
J-3471	100 mm	279.7 mm	274.6 mm

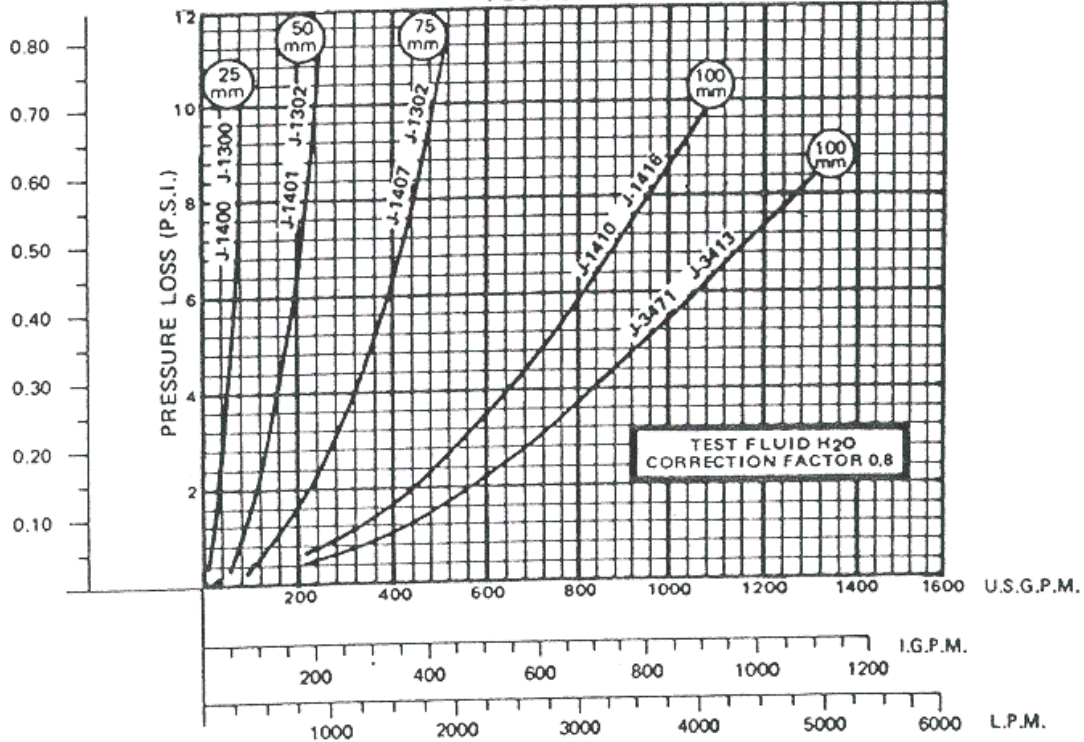
¹ Maximum width of valve.



ADAPTERS

FIG. NO.	SIZE	A	B
J-1300	25 mm	58.7 mm	86.5 mm
J-1302	37 mm	77.7 mm	103.1 mm
J-1302	50 mm	77.7 mm	103.1 mm
J-1302	75 mm	104.7 mm	140.5 mm
J-1416	100 mm	177.8 mm	177.8 mm
J-3413	100 mm	196.8 mm	164.4 mm

FLOW CURVES



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DRY - BREAKS



SELECTION CHART

MATERIAL SEAL	SIZE					
	25 mm	38 mm	50 mm	75 mm	100 mm	100 mm Full
COUPLERS						
ALUMINUM	J-1400	J-1401	J-1401	J-1407	J-1410	J-3471
BUNA	J-1400-001	J-1401-001	J-1401-009	J-1407-001	J-1410-001	J-3471-001
VITON	J-1400-002	J-1401-002	J-1401-010	J-1407-002	J-1410-003	-
TEFLON	-	J-1401-005	J-1401-014	-	-	-
STAINLESS STEEL	-	J-1401	J-1401	J-1435	-	-
BUNA	-	J-1401-006	-	-	-	-
VITON	-	J-1401-007	J-1401-015	-	-	-
TEFLON	-	J-1401-008	J-1401-016	J-1435-001	-	-
ADAPTERS						
ALUMINUM	-	-	J-1302	-	J-3472	J-3413
BUNA	-	-	J-1302-017	-	J-3472-001	J-3413-001
VITON	-	-	J-1302-018	-	-	-
TEFLON	-	-	-	-	-	-
BRASS	J-1300	J-1302	J-1302	J-1302	-	-
BUNA	-	-	J-1302-009	-	-	-
VITON	J-1300-001	J-1302-001	J-1302-010	J-1302-035	-	-
TEFLON	-	J-1302-008	J-1302-016	-	-	-
STAINLESS STEEL	-	-	J-1305	J-1447	-	-
BUNA	-	-	-	-	-	-
VITON	-	-	-	-	-	-
TEFLON	-	-	J-1305-001	J-1447-001	-	-

For information on seals and configurations not shown above, please contact Emco Wheaton.

NOTES:

1. For full and complete descriptions of specific valves see index at left for catalog page number.
2. The 50 mm. Coupler can also be provided in aluminum with stainless steel trim.
3. The 75 mm. Coupler can also be provided with a straight swivel or a swivel elbow only in aluminum. The stainless steel coupler is only available with the straight swivel. The 75 mm. Adapter is available in brass or stainless steel (with Teflon only).
4. The 100 mm. Coupler can be provided with a straight swivel, elbow swivel or a double swivel elbow.
5. The Full 100 mm. Coupler is available with the straight swivel only.

INDEX

COUPLER	ADAPTER	Section J Page
J-1400	& J-1300	3
J-1401	& J-1302	5 & 7
J-1407	& J-1302	9
J-1410	& J-3472	11

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Fluid Handling Equipment — for everything that flows

INTRODUCTION

Avery-Hardoll Quick-Release Self-Sealing Couplings are designed for use wherever it is necessary to connect and disconnect hoses and pipelines under pressure, quickly and without spillage. They are used for the safe economic transfer of a diverse range of petroleum products and other liquids, for road and rail tank car loading and off-loading, quayside bunkering and hose exchange installations in lube plants, etc.

Industrial Couplings are available in four nominal bore sizes:

4 inch. (10.2 cms.), 3" inch. (7.6 cms.), 2½" inch. (6.3 cms) and 1½" inch. (3.8 cms.).

COMPATIBILITY

Each Avery-Hardoll coupling incorporates a variety of materials in its construction.

In the standard range the materials normally in contact with the liquid are:

1½"	2½"	3"	4"	MATERIALS	2½" Stainless Steel Version
•	•	•	•	Gunmetal BS.1400 - G1 - C	
	•	•	•	Aluminium Bronze G. C. Q.	
•	•		•	Phosphor Bronze BS. 369	
•	•		•	Phosphor Bronze G. C. Q.	
	•			Phosphor Bronze BS. 407/2	
	•			Phosphor Bronze BS.1400 - PB1 - C	
		•		Brass BS. 251 - CZ. 112	
•		•	•	Brass G. C. Q.	
		•	•	Brass 250 Gr. B	
			•	Brass BS. 249	
			•	Brass 1002/1941	
•	•	•	•	Stainless Steel BS. 80 or EN56	•
		•	•	Stainless Steel G. C. Q.	
			•	Steel	
	•		•	Aluminium Alloy D. T. D. 304	
			•	Manganese Bronze BS.1400 - HTB - 1	
•			•	Manganese Bronze G. C. Q.	
•	•	•		Monel Metal (D. T. D. 204) or Nickel Alloy (D. T. D. 268)	

Generally suitable for use with most petroleum products, some solvents, certain foodstuffs, and other fluids. Also a special version of the 2½ inch coupling manufactured entirely in stainless steel.

Seals normally Nitrile to DTD 560 Grade C Quality P. (Viton - in 2½" Stainless Steel Couplings). Viton A and Ethylene Propylene seals are available for special applications.

Normal temperature limitations on seals are as follows:

Nitrile...120°C, Viton...180°C and Ethylene Propylene...80°C.

OPERATION

The principle of operation is identical for all four sizes of couplings.

A complete coupling consists of a hose unit and tank unit, each complete with dust cap. In the case of the 4" and 2½" tank units a cap is also available with a spring loaded locking plunger which must be released before the cap is removed. This cap can be padlocked.

LIQUIP SALES PTY. LIMITED

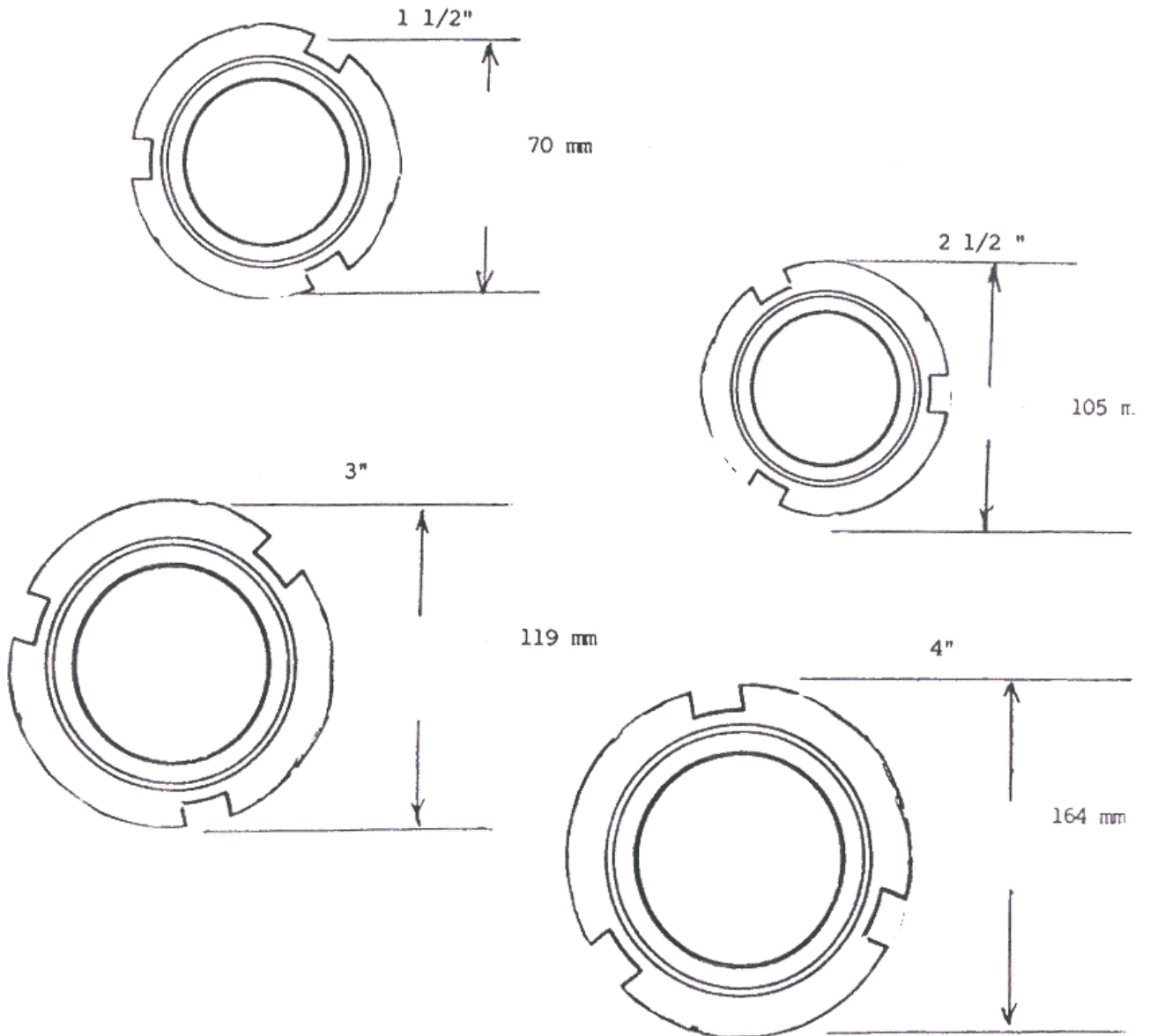
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Since the products have many different applications, a discription of the market in terms of shares and niches would be somewhat unfair. However, some segments can easily be defined:

- Road- and raitanker industry
- Oil companies
- Oil depots
- Off-shore
- Petrochemical industry
- Aviation
- Military Forces
- Service Stations
- Paint industry
- Food industry
- Liquid Petrol Gas industry
- Whisky-distilleries

Since several of these segments can be found in all countries the TODO-market is regarded as global. The export market is also the major growth area of the company at present. There are no limits regarding legislation or standards known, that might shut any market to the TODO-products.

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Då ej annat anges/Unless otherwise prescribed:
 Toleranser/Tolerances: Diameternått/Diameteral dimensions JS 13-ji 13. Längdnått/Length toler dimensions JS 14-ja 14.
 Övrigt/Misc: Skarpa kanter brytas max 0.2/Sharp edges to be burred max. 0.2.
 Mått/en gäller före behandling/Measures valid before treatment
 TODO förbehåller sig rätt till ändring utan föregående meddelande /All right to change without notice is reserved

Ändring/Alteration									
Pos	Sign	Dat /Date	Andr /Alt	Anmärkning/Note	Pos	Sign	Dat /Date	Andr /Alt	Anmärkning/Note

Nominell dia: Nominal dia: Nenn durch messer.	Artikel Nr: Article No: Artikel Nr.	Materialidentifikations Nr: Material identification No: Materialkenn Nr.	Arbetstryck: Working pressure: Arbeitsdruck:
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TODO

Part No: 5531C-2207

○ Size: DN 80 - 3" / PN 10

Connection: 3" BSP (ISO 228 - G 3)

Mtrl: Aluminium / Seal: FPM/PUR

Serie No: nnnnnn

Huvudsakligt material: Main material: Hauptsächliches Material:	Anslutning: Connection: Anschluss:	Tätning: Sealing: Dichtung:	Gångtätning: Thread sealing: Gewindedichtung:
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TODO

Part No: 5531C-2207

○ Size: DN 80 - 3" / PN 10

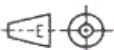
Connection: 3" BSP (ISO 228 - G 3)

Mtrl: Aluminium / Seal: FPM/PUR

Serie No: nnnnnn

Skala/Scale 1:1

Material Material		Behandling Treatment		Utg /Issue	
Ritad Drawn	KR	Dat Date	920218	Skala Scale	2.5:1
Amne Blank		Data nr. Comp No.	SKYLT		
TODO AB		TEXT FOR PLATE 5531C-2207		Blad Sheet 1 / 1	
				Ritning nr./Drawing No.	
				<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> 1 </div>	
				SKYLT	



INTERCHANGEABILITY

TODO - AVERY HARDOLL

<u>Coupl. dia</u>	<u>Description</u>	<u>TODO no</u>	<u>Avery Hardoll no</u>
70	Tankunit	5000-2207	CCMY239M2
70	Tankunit	5001-2207	CCMY211M2
70	Hoseunit	5005-2407	CCMY120M2
105	Tankunit	5331C-2207	CCMY66M3
105	Tankunit	5400C-2207	CCMY41M3
105	Tankunit	5400C-4407	CCMY1265M2
105	Hoseunit	5332C-1307	CCMY40
105	Hoseunit	5332C-2407	CCMY140
105	Hoseunit	5332E-4407	CCMY1272M2
119	Tankunit	5500C-2207	CCMY4041
119	Tankunit	5531C-2207	CCMY4066
119	Hoseunit	5532C-1307	CCMY4040
119	Hoseunit	5532C-2407	CCMY4140
164	Tankunit	5600-1107	CCMY4500
164	Hoseunit	5632D-1307	CCMY559
164	Hoseunit	5832D-1307	CCMY558

Note: TODO units have viton seals as standard,
Avery Hardoll units have nitrile as standard.



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F A C S I M I L E / M A I L

TO: **Tony Wade**

Date : 24th November 1995

FAX NO.....>725 1252

COMPANY..>LIQUIP SALES Ltd

FROM **BOB GOLDSWORTHY**
Head Office Sales & Services
Sydney

SUBJECT..> **AVERY HARDOLLL EQUIPTMENT**

As requested the following is the parts you inquired of :-

709-HUMS3625	stick handle kit	\$470.73	in stock
709-CCMY40-10	2.5" alum.cam hose unit	\$850.00	out of stock
709-CCMY41M3	2.5" flanged tank unit	\$495.15	" "
709-CCMY66M3	2.5" thread BSP tank unit	\$406.75	" "
709-CCMY4040	3" alum.cam hose unit	\$1133.55	" "
709-CCMY4041	3" tank unit flanged	\$580.00	in stock
709-CCMY4066	3" tank unit thread BSP	\$497.15	out of stock