

How Master Data as a Service Solves LyondellBasell's Master Data Challenges

Agenda

- About LyondellBasell
- Symptoms of the LyondellBasell Master Data Problem
- Business impacts of the LyondellBasell Problem
- Master Data as a Service – the planned Prometheus solution

About LyondellBasell

- The world's largest producer of polymer compounds and the largest licensor of polyolefin technologies.
- Manufactures at 55 sites in 17 countries
- LyondellBasell has grown through merger and acquisition, inheriting the EAM data quality and structures from the legacy operators.



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Symptoms of the LyondellBasell Master Data Problem

- Data transformations from legacy systems to LYB resulted in corrupted records.
- Spare parts records are inaccurate or incomplete making ordering material a show stopper.
- Bills of material are missing or insufficient to clearly identify needed parts. Project records clearly not identifiable when transferred over to site.
- Needed min/max on materials not completed from SPIR information.



Business Impacts of the LyondellBasell Master Data Problem

- Planners are unable to accurately plan work and allocate appropriate materials.
 - No Make/Model information on equipment in SAP.
 - Result: unplanned downtime and expedited materials procurements.
- Maintenance workers are unable to efficiently perform work.
 - Parts identified for equipment repair are incorrect descriptions and parts.
 - Result: increased maintenance backlog and reduced cycles for proactive maintenance.



Business Impacts of the LyondellBasell Master Data Problem

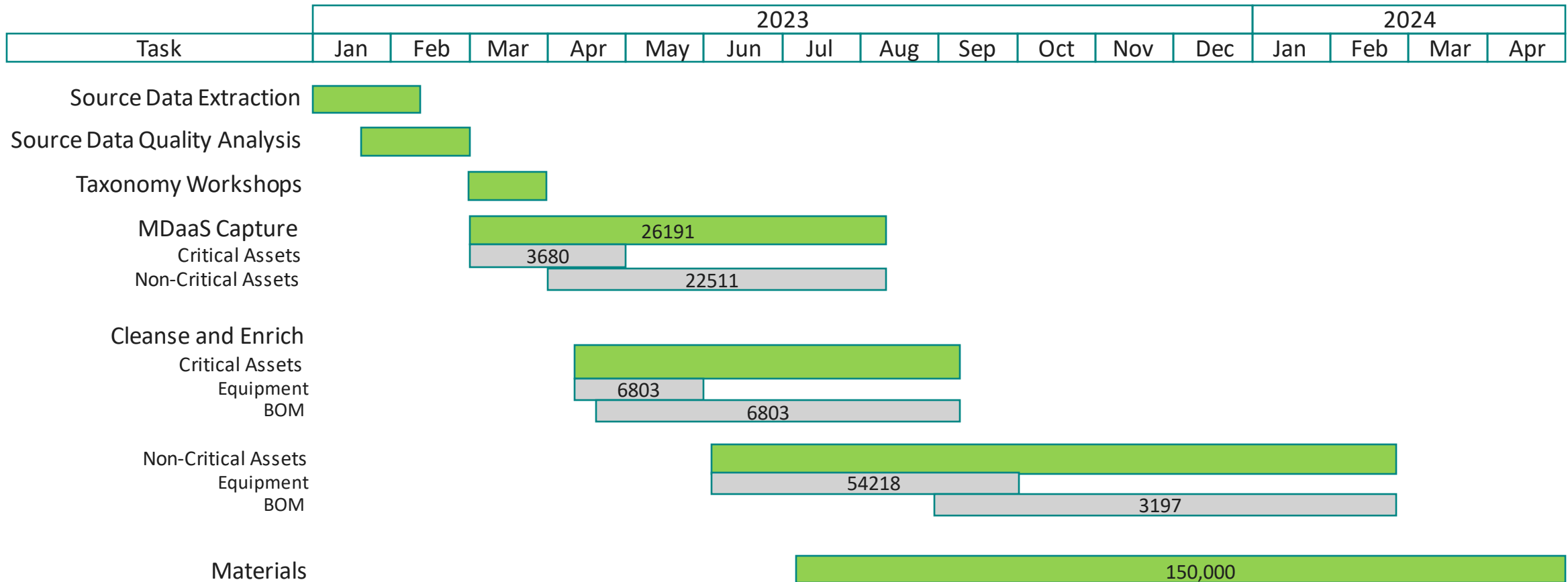
- Procurement is unable to accurately plan material purchases with optimized quantities and negotiated agreements.
 - Result: Ballooning MRO spares inventory and costs.
- Operations is unable to achieve top quartile performance due to unplanned downtime.
 - Need for identification of production critical spare parts in warehouse.
 - Proper min/max established based on suggested SPIR info not available.
 - Critical equipment failure results in sometime long lead items not identified properly.
 - Result: Unit is down longer than expected.



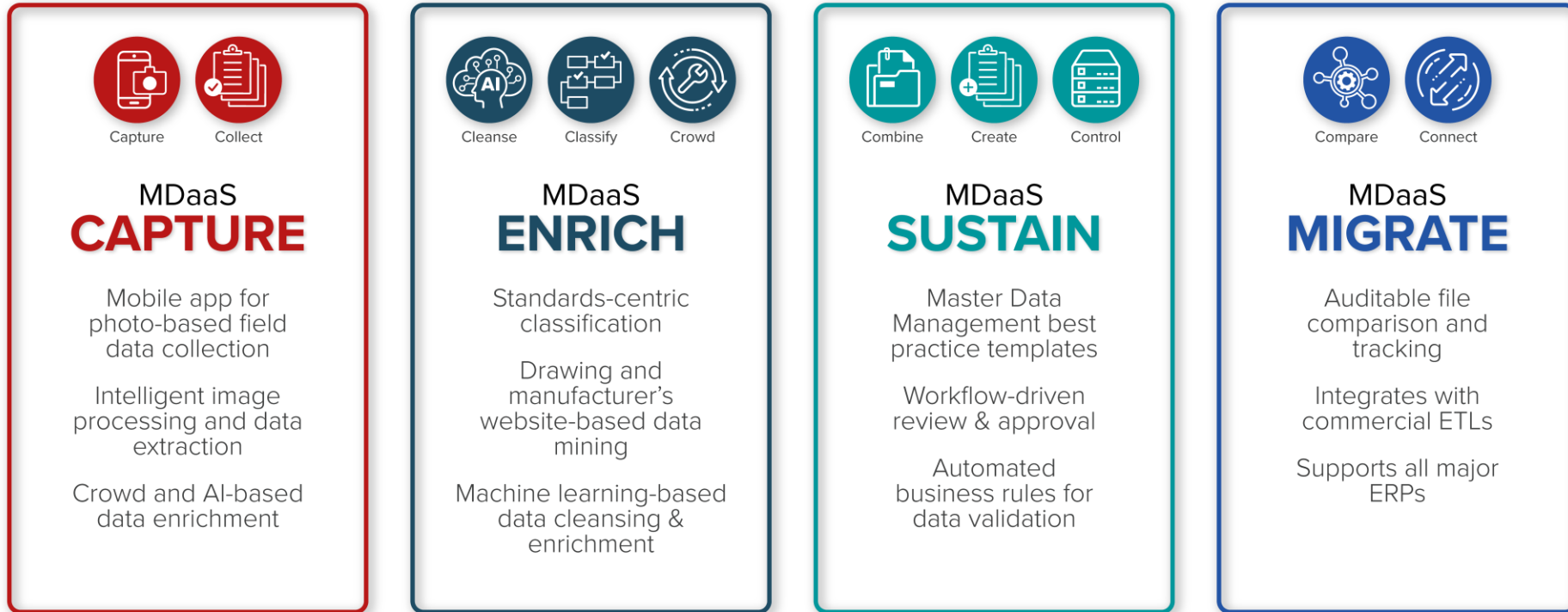
Master Data as a Service (MDaaS)

The Proposed Solution for LyondellBasell

Project Schedule



Master Data as a Service (MDaaS)



Prometheus Methodology: “Get It Clean, and Keep It Clean”



1

BUILD

- Establishing global taxonomy
- Internationally recognized standards (ISO14224, UNSPSC)
- Business Rules
- Data Quality Culture

2

FIX

- Data quality improvement
- Data quality monitoring
- Data remediation / transformation
- De-Duplication

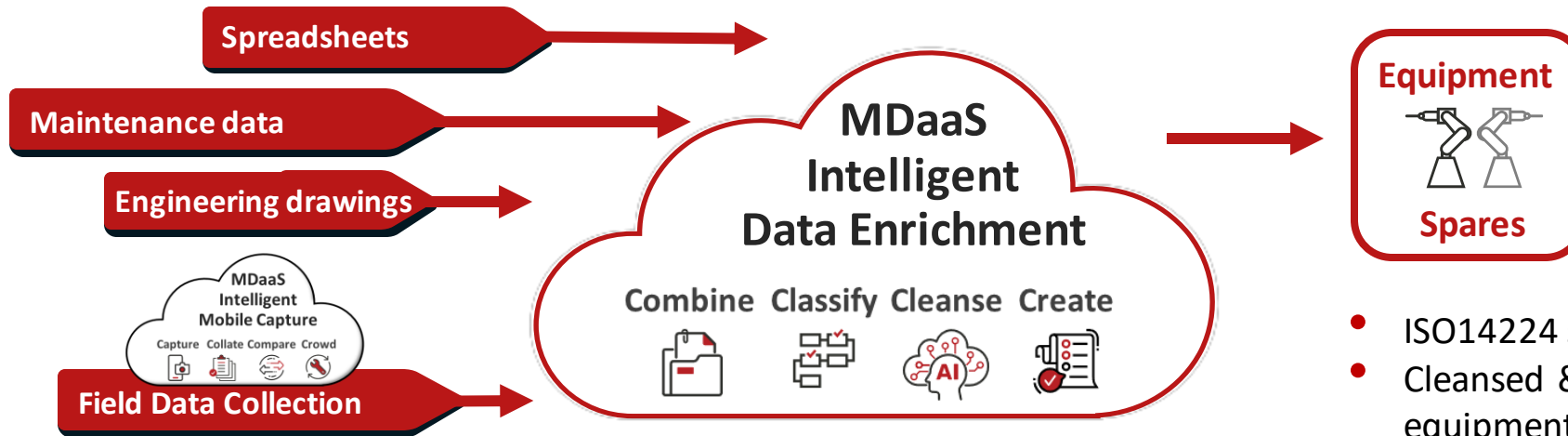
3

SUSTAIN

- Data governance process
- Data governance organization
- Data governance implementation
- Master Data as a Service + SAP MDG

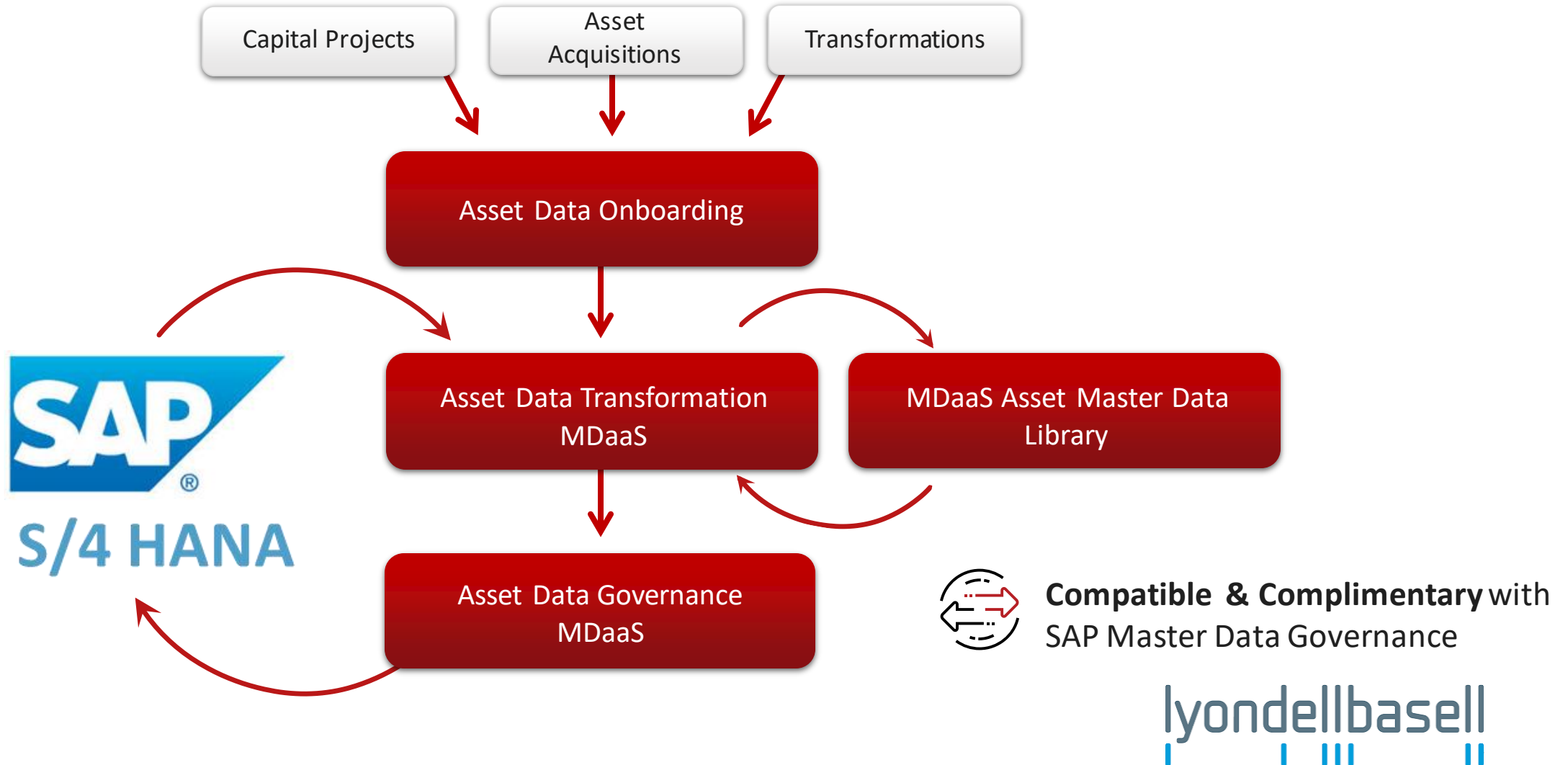
MDaaS Intelligent Data Enrichment

Validating, Transforming & Enriching Asset Master Data



- ISO14224 standard functional locations
- Cleansed & enriched ISO14224 standard equipment records
- Cleansed & enriched UNSPSC standard spares records
- Functionally equivalent equipment & spares
- Alternate suppliers

Master Data as a Service (MDaaS)



Sample LyondellBasell Equipment Cleansing & Enrichment

TAG_ID	DESCRIPTION	LONG DESCRIPTION	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER
GA-101A	QUENCH OIL CIRCULATION PUMP	-	-	-	-	SHIN NIPPON MACHINERY	24X38 HVC	PH-27724

TAG_ID	ISO_CLASSES	NOUN	MODIFIER	CHARACTERISTICS_NAME	CHARACTERISTICS_VALUE
GA-101A	PUCE	PUMP	CENTRIFUGAL	TYPE	HORIZONTAL
GA-101A	PUCE	PUMP	CENTRIFUGAL	DISCHARGE PRESSURE	10.63 KSCG
GA-101A	PUCE	PUMP	CENTRIFUGAL	SUCTION PRESSURE	0.84 KSCG RATED
GA-101A	PUCE	PUMP	CENTRIFUGAL	PUMP SIZE	26 X 24 IN
GA-101A	PUCE	PUMP	CENTRIFUGAL	FLOW RATING	4530 M3/H RATED
GA-101A	PUCE	PUMP	CENTRIFUGAL	HEAD RANGE	103.7 M
GA-101A	PUCE	PUMP	CENTRIFUGAL	NUMBER OF STAGES	1
GA-101A	PUCE	PUMP	CENTRIFUGAL	POWER RATING	1470 KW RATED
GA-101A	PUCE	PUMP	CENTRIFUGAL	EFFICIENCY	82%
GA-101A	PUCE	PUMP	CENTRIFUGAL	PUMP DESIGN	CLOSED IMPELLER
GA-101A	PUCE	PUMP	CENTRIFUGAL	SPEED RATING	980 RPM
GA-101A	PUCE	PUMP	CENTRIFUGAL	IMPELLER DIAMETER	933 MM DESIGN
GA-101A	PUCE	PUMP	CENTRIFUGAL	BODY TYPE	RADIAL SPLIT CASE
GA-101A	PUCE	PUMP	CENTRIFUGAL	TEMPERATURE RATING	194 DEG C
GA-101A	PUCE	PUMP	CENTRIFUGAL	ADDITIONAL FEATURES	CONNECTION:300 X 300 LB RF;MOUNTING:C-LINE;SERVICE:QUENCH OIL

TOYO ENGINEERING CORPORATION CENTRIFUGAL PUMP DATA SHEET (1/2)

CUSTOMER		
LOCATION		
UNIT		
PURCHASER		
ITEM NO.	GA-101ABC	REQ. NO. 0511
SERVICE	QUENCH OIL CIRCULATION PUMP	
NO. REQ'D	WORKING 2 / STAND-BY 1 / TOTAL 3	
OPERATING CONDITIONS		
LIQUID QUENCH OIL		
CORR. (ERO. BY)	#6	
PUMP TEMP.	194 MIN. MAX. °C	
SPEC. GRAV. @PT	0.944 MAX.	
VAPOR PRESS. @PT	0.85 (KSCG)	
VISCOSITY @PT	3.3 #1 (CP)	
CONSTRUCTION		
MFR	SHIN NIPPON MACHINERY	MODEL 24X38 HVC
MATERIALS		
TYPE	(X)HOR. ()VERT. ()SELF PRIMING	
CASE MT.	()BRACK(X)C-LINE()FOOT()VERT.	
VERT.	()INLINE()BARREL()SUMP()SUBMERG.	
CASE TYPE	()S-VOL. (X)D-VOL. ()DIFFUSER	
CASE SPLIT	()AXIAL (X)RADIAL ()RING-SECT	
NOZZLE SIZE	RATING FACE POSITION	
SUCTION	24" 300 HF TOP	
DISCH.	24" 300 HF TOP	
NO. OF STAGES	()OVHG (X)BET-BRG	
IMPELLER	(X)CLOSED()SEMI-OPEN()OPEN	
()SINGLE SUCT. (X)DBL SUCT. ()INDUCER		
DIA. DES.	933 (mm)MAX/MIN 965 / 812 (mm)	
WRG RING DIA	505 (mm)CLEAR. 0.787 (mm)	
BRG RADIAL	SLEVE NO	
THRUST	BALL NO 7318 BDB	
DN VALUE	11.5 x 109 (mm.rpm)	
LUBE	(X)RING OIL()FLOOD()FLING()PRESS.	
()GREASE()PURE MIST ()PURGE MIST		
POWER TRANS	(X)DIRECT ()GEAR ()V-BELT	
CPLG(X)FLEX()GEAR(X)DISK()RIGID(X)SPACER		
MFR	N. PILLAR MODEL 71 TYPE	
ROTATION VIEWED FROM CPLG END	()CW(X)CCW	
BASEPLATE	(X)COMMON ()SOLE ()SEPARATE	
SHAFT SEAL	()NON-SEAL ()	
()PACKING:MFR	MAT'L	
(X)MECH. SEAL:MFR	NIPPON PILLAR	
TYPE	S-EF-Q API CODE 85AXX (BELLOW)MFR'S CODE @BS21-1900-160	
MAT'L:FACES	TUNG. CARBIDEVS TUNG. CARBIDE METAL SUSA316. SUSA304 GASKET	

SHORT DESCRIPTION	LONG DESCRIPTION
PUMP:CNTRFGL;HORIZ,10.63 KSCG,0.84 KSCG	PUMP:CENTRIFUGAL;TYPE:HORIZONTAL,DISCHARGE PRESSURE:10.63 KSCG,SUCTION PRESSURE:0.84 KSCG RATED,PUMP SIZE:26 X 24 IN,FLOW RATING:4530 M3/H RATED,HEAD RANGE:103.7 M,NUMBER OF STAGES:1,POWER RATING:1470 KW RATED,EFFICIENCY:82%,SPEED RATING:980 RPM,BODY TYPE:RADIAL SPLIT CASE,TEMPERATURE RATING:194 DEG C,ADDITIONAL FEATURES,CONNECTION:300 X 300 LB RF,MOUNTING:C-LINE,SERVICE:QUENCH OIL MAKE:SHIN NIPPON MACHINERY, MODEL NUMBER:24X38 HVC, SERIAL NUMBER:PH-27724

Sample LyondellBasell Material Cleansing & Enrichment

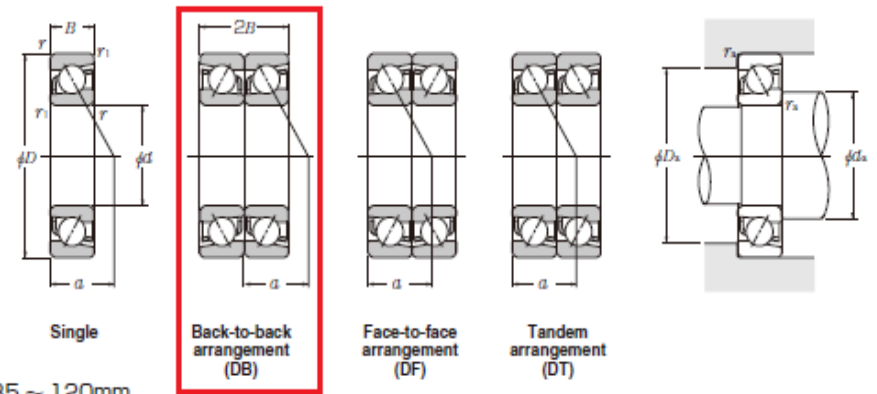
MATERIAL_ID	BOM_COMPONENT_TEXT1	OEM NAME	OEM PART NUMBER	OPM NAME	OPM PART NUMBER	WEB_URL_LINK_1	WEB_URL_PAGE
M0000018	BALL BEARING-THRUST	SHIN NIPPON MACHINERY		NTN	7318BDB	http://www.ntn.co.th/download/NTN%20General%20Bearing%20Catalog.pdf	159, 151, 152, 86

MATERIAL ID	UNSPSC	NOUN	MODIFIER	CHARACTERISTICS_NAME	CHARACTERISTICS_VALUE
M0000018	31171504	BEARING	BALL	TYPE	ANGULAR CONTACT,THRUST
M0000018	31171504	PUMP	BALL	INSIDE DIAMETER	90 MM
M0000018	31171504	PUMP	BALL	OUTSIDE DIAMETER	190 MM
M0000018	31171504	PUMP	BALL	OVERALL WIDTH	86 MM
M0000018	31171504	PUMP	BALL	CLOSURE TYPE	OPEN
M0000018	31171504	PUMP	BALL	NUMBER OF ROWS	2
M0000018	31171504	PUMP	BALL	CAGE MATERIAL	STEEL
M0000018	31171504	PUMP	BALL	BEARING SERIES	73
M0000018	31171504	PUMP	BALL	DYNAMIC LOAD RATING	156 KN
M0000018	31171504	PUMP	BALL	STATIC LOAD RATING	135 KN
M0000018	31171504	PUMP	BALL	SPEED RATING	3400 RPM (GREASE),4500 RPM (OIL)
M0000018	31171504	PUMP	BALL	CERTIFICATION/STANDARD	
M0000018	31171504	PUMP	BALL	ADDITIONAL FEATURES	PRESSED CAGE, BACK TO BACK ARRANGEMENT

SHORT DESCRIPTION	LONG DESCRIPTION
BEARING:BALL;ANGLR CONT,THRST,90X190X86	BEARING:BALL;TYPE:ANGULAR CONTACT,THRUST,INSIDE DIAMETER:90 MM,OUTSIDE DIAMETER:190 MM,OVERALL WIDTH:86 MM,CLOSURE TYPE:OPEN,NUMBER OF ROWS:2,CAGE MATERIAL:STEEL,BEARING SERIES:73,DYNAMIC LOAD RATING:156 KN,STATIC LOAD RATING:135 KN,SPEED RATING:3400 RPM (GREASE),4500 RPM (OIL),ADDITIONAL FEATURES:BACK TO BACK ARRANGEMENT,PRESSED CAGE OEM:SHIN NIPPON MACHINERY,OPM PART NUMBER:7318BDB, DRAWING NUMBER:3PS-67571,POSITION NUMBER:135

Single and Duplex Angular Contact Ball Bearings

NTN

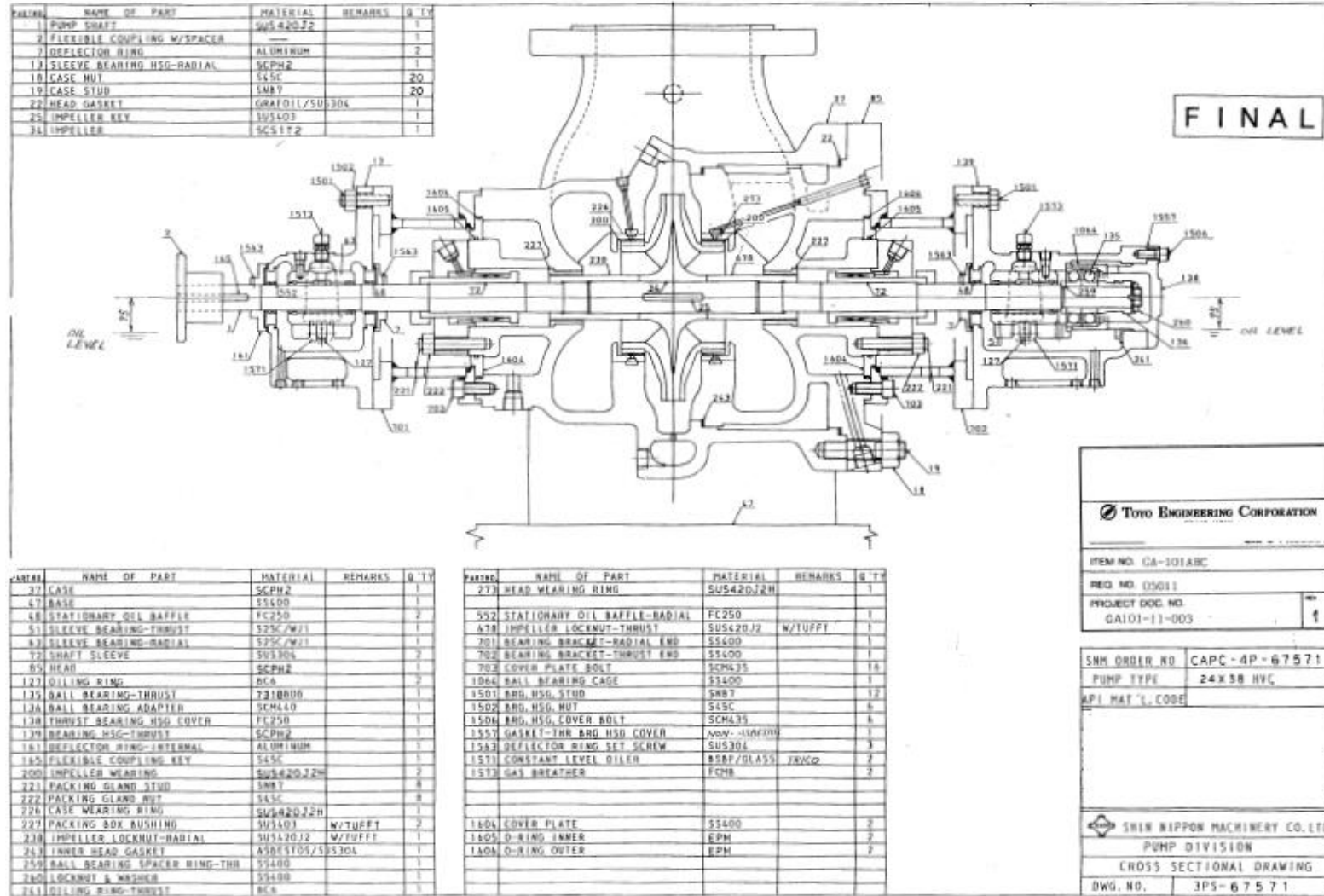


d 85 ~ 120mm

d	Boundary dimensions					Basic load ratings				Limiting speeds ¹⁾		Bearing numbers	Load center kg mm a	Mass kg single (approx.)
	D	B	2B	$r_{1max}^{(2)}$	$r_{2max}^{(2)}$	dynamic kN	static kN	dynamic kgf	static kgf	grease min ⁻¹	oil min ⁻¹			
85	180	41	82	3	1.1	159	133	16 200	13 500	4 200	5 600	7317	59	4.34
	180	41	82	3	1.1	146	122	14 800	12 400	3 600	4 800	7317B	76	4.43
90	125	18	36	1.1	0.6	36.0	38.0	3 650	3 850	5 200	7 000	7918	40	0.658
	140	24	48	1.5	1	65.0	63.5	6 650	6 450	4 900	6 500	7018	45	1.35
	160	30	60	2.0	1	118	103	12 000	10 500	4 400	5 900	7218	51	2.18
	160	30	60	2.0	1	107	94.0	10 900	9 550	3 800	5 000	7218B	67.5	2.22
	190	43	86	3.0	1.1	171	147	17 400	15 000	4 000	5 300	7318	62	5.06
190	43	86	3.0	1.1	156	135	15 900	13 800	3 400	4 500	7318B	80.5	5.16	

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Sample LyondellBasell Bill of Material Creation



FINAL

TOTO ENGINEERING CORPORATION

ITEM NO. CA-101ARC

REQ. NO. 05011

PROJECT DOC. NO. GA101-11-003

SNH ORDER NO. CAPC-4P-67571

PUMP TYPE 24X38 HVC

API MAT'L. CODE

SHIN NIPPON MACHINERY CO. LTD
PUMP DIVISION

CROSS SECTIONAL DRAWING

DWG. NO. 3PS-67571

Sample LyondellBasell Bill of Material Creation

BOM_ID	ASSEMBLY_ID	MATERIAL_ID	ITEM CATEGORY	SEQUENCE	INSTALLED QUANTITY	UOM	BOM_COMPONENT_DESCRIPTION	BOM_COMPONENT_TEXT2 (OEM PN OPM PN DWG POS)
B0000001	-	-	H	010	1	EA	BOM;PUMP,SHIN NIPPON,24X38 HVC,26 X 24IN	-
B0000001	A1000001	-	I	010	1	EA	PMA;PUMP ASSEMBLY	-
B0000001	A1000001	M0000001	T	010	1	EA	SHAFT:PMP;SST GR SUS420J2	SHIN NIPPON - - 3PS-67571 1
B0000001	A1000001	M0000003	T	020	2	EA	RING:DFTR;AL	SHIN NIPPON - - 3PS-67571 7
B0000001	A1000001	M0000004	T	030	1	EA	HOUSING:BRG;RDL SLV,CS GR SCPH2	SHIN NIPPON - - 3PS-67571 13
B0000001	A1000001	M0000005	T	040	20	EA	NUT;CASE,CS GR S45C	SHIN NIPPON - - 3PS-67571 18
B0000001	A1000001	M0000006	T	050	20	EA	STUD;CASE,ALY STL GR SNB7	SHIN NIPPON - - 3PS-67571 19
B0000001	A1000001	M0000007	T	060	1	EA	GASKET;HD,GRAFOIL/SST GR SUS304	SHIN NIPPON - - 3PS-67571 22
B0000001	A1000001	M0000008	T	070	1	EA	KEY:IMPLR;SST GR SUS403	SHIN NIPPON - - 3PS-67571 25
B0000001	A1000001	M0000009	T	080	1	EA	IMPELLER;CLSD,SST GR SCS1T2	SHIN NIPPON - - 3PS-67571 34
B0000001	A1000001	M0000010	T	090	1	EA	CASE;CS GR SCPH2	SHIN NIPPON - - 3PS-67571 37
B0000001	A1000001	M0000011	T	100	1	EA	BASE;400 SST	SHIN NIPPON - - 3PS-67571 47
B0000001	A1000001	M0000012	T	110	2	EA	BAFFLE:OIL;STATNRY,CI GR FC250	SHIN NIPPON - - 3PS-67571 48
B0000001	A1000001	M0000013	T	120	1	EA	BEARING:SLV;THRST,CS GR S25C/WJ1	SHIN NIPPON - - 3PS-67571 51
B0000001	A1000001	M0000014	T	130	1	EA	BEARING:SLV;RDL,CS GR S25C/WJ1	SHIN NIPPON - - 3PS-67571 63
B0000001	A1000001	M0000015	T	140	2	EA	SLEEVE:SHFT;SST GR SUS304	SHIN NIPPON - - 3PS-67571 72
B0000001	A1000001	M0000016	T	150	1	EA	HEAD;CS GR SCPH2	SHIN NIPPON - - 3PS-67571 85
B0000001	A1000001	M0000017	T	160	2	EA	RING;OILING,BRZ GR BC6	SHIN NIPPON - - 3PS-67571 127
B0000001	A1000001	M0000018	T	170	1	EA	BEARING:BALL;ANGLR CONT,THRST,90X190X86	SHIN NIPPON - - 7318BDB 3PS-67571 135
B0000001	A1000002	-	I	010	-	EA	PMA;PUMP COUPLING ASSEMBLY	-
B0000001	A1000002	M0000002	T	010	1	EA	COUPLING:FLEX;W/ SPCR	SHIN NIPPON - NIPPON PILLAR 71 3PS-67571 2
B0000001	A1000002	M0000023	T	020	1	EA	KEY;FLEX CPLG,CS GR S45C	SHIN NIPPON - - 3PS-67571 165

Thank You