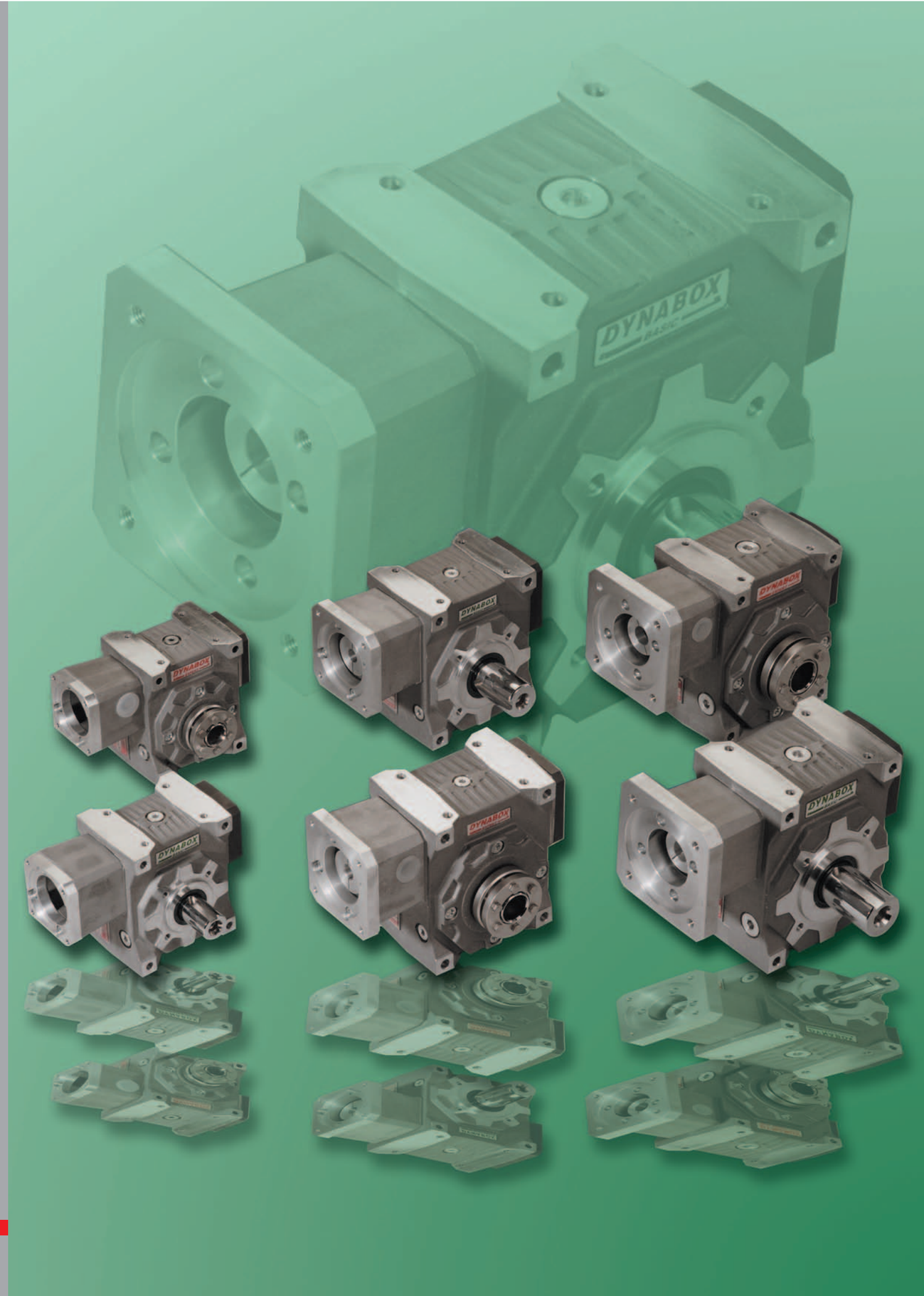
NEW SIZE 25
AVAILABLE

DYNABOX®

RIGHT ANGLE
SERVO GEARHEADS



GIRARD TRANSMISSIONS
PRECISION GEARHEADS

April 2008

DYNABOX® HIGHLIGHTS

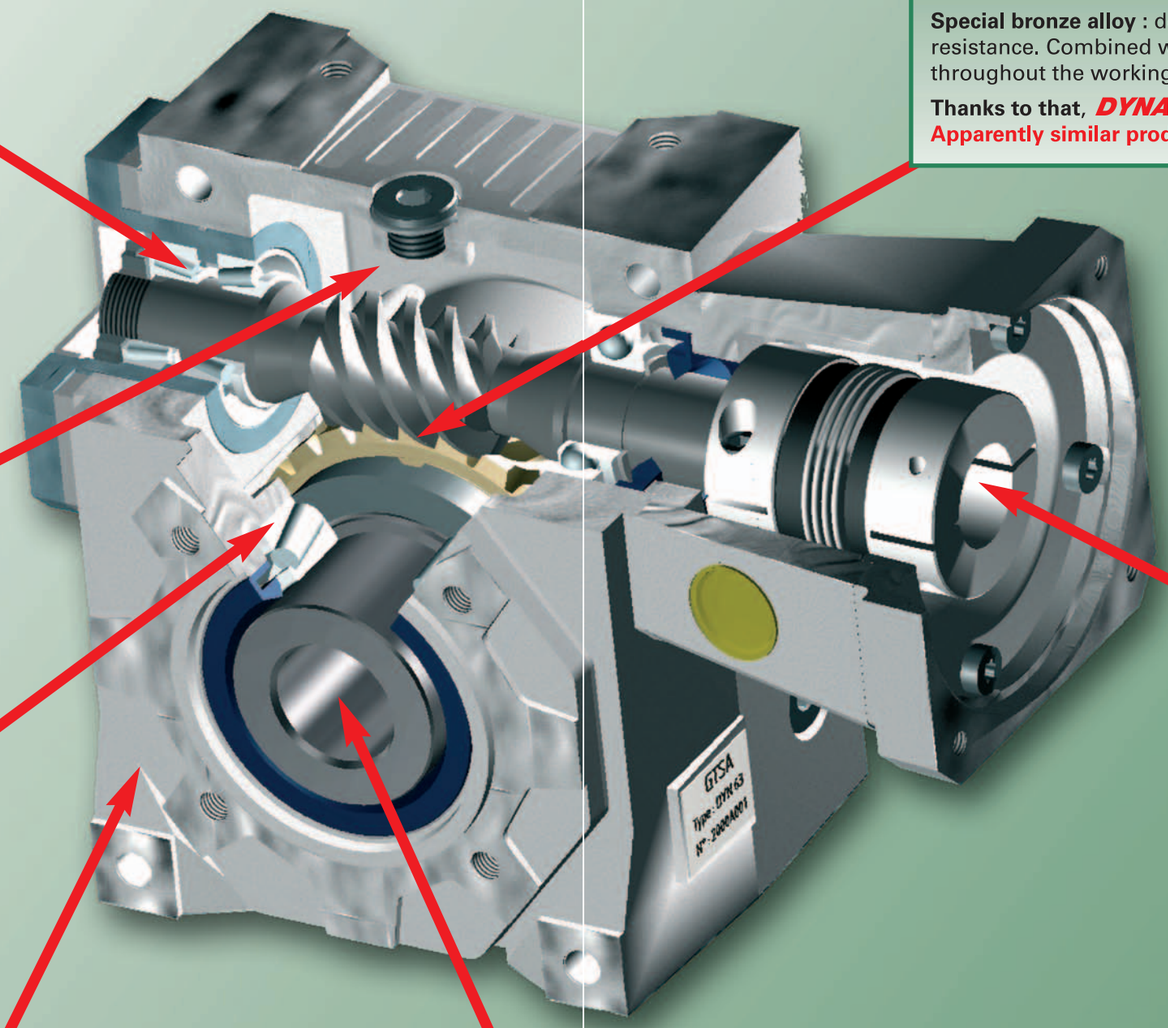
Preloaded input taper bearings :

provides higher stiffness.
2 bearings mounted on same side insure constant preload while temperature raises.
It maximizes bearing life.
On the opposite side, an axial-free ball bearing.

Optimized contact pattern : a unique process to cut gears, combined to a state of the art assembly lead to a nearly 90% pattern surface, reducing drastically the contact pressure.

Special bronze alloy : developped by ourselves, it provides an unmatched wear resistance. Combined with 90% contact pattern, lowest backlash is maintained throughout the working life of the gearhead.

Thanks to that, *DYNABOX*® gearheads can run up to 6000RPM
Apparently similar products available on the market do not offer such performance



Maintenance free :

life-lubricated unit
with high performance
synthetic lubricant

Servomotor mounted within 5 minutes :

a high stiffness below coupling eliminates shaft alignement problems.
A mating flange to ***your*** servomotor can always be supplied from our stock.

Oversized taper roller bearings, providing unmatched radial loads (size 25 = ball bearings)

Single piece housing, made of cast and heat treated aluminium-magnesium alloy. Offering superior rigidity and low weight

Output torsional backlash available in 3 ranges :

EXPERT : 1 arcminute for the most demanding applications
MEDIUM : 5 arcminutes, a good compromise price/quality
BASIC : 10 arcminutes, a budget gearhead to cut servo system costs

DYNABOX® SELECTION

START/STOP SERVICE S5

- Calculate acceleration torque on gearbox output :

C2acc = C1accx**i**xηx**F1**x**F2**

F1 and **F2** : correction factors as per following chart.

GEARBOX RUNNING TIME DURING 1 FULL CYCLE					
	10 %	30 %	50 %	70 %	90 %
F1	0,7	0,85	1	1,11	1,2

NUMBER OF STARTS PER HOUR				
	1000 to 2000	2000 to 3000	3000 to 5000	5000 to 10000
F2	1 to 1,35	1,35 to 1,45	1,45 to 1,6	1,6 to 1,9

Intermediates values
To be interpolated

- Select the gearbox size in the column **Torque S5 :**

Torque S5 > C2acc

CONTINUOUS SERVICE S1

- Calculate nominal torque on gearbox output

C2nom = C1nomx**i**xη

- Select the gearbox size in the column **Torque S1 :**

Torque S1 > C2nom

LEGEND

C1acc (N.m) : motor acceleration torque
C1nom (N.m) : nominal motor torque
C2acc (N.m) : gearbox output acceleration torque
C2nom (N.m) : Gearbox output nominal torque
E-stop (N.m) : gearbox output emergency torque (2 seconds duration maximum, applied a maximum of 25000 times over the gearbox life)
C1f (N.m) : starting input friction torque (without any load on output)
N1 : maximum input RPM to be achieved during a full cycle (S5 service) or input nominal RPM (S1 service)
i : exact gear ratio
Et (N.m/minute) : Torsional stifness on output
ig (kg.m²) : polar moment of inertia on input (to be added to coupling inertia, see page 10)
η (%) : gearbox efficiency at considered input RPM
Fr (N) : permissible radial load on output shaft (applied at the middle of the shaft)
Fa (N) : permissible axial load on output shaft

REVERSIBILITY CLASSES	
1	Total reversibility
2	Uncertain reversibility
3	Self-locking at N_1=0

Notes : self-locking units can become reversible under vibrations.
Indicated efficiency values are achieved after a 24 hours full load operation

TECHNICAL SPECIFICATIONS

N1		6000		4000			3000			2000			1000										
	i	Torque S5	η	Torque S1	Torque S5	η	Torque S1	Torque S5	η	Torque S1	Torque S5	η	Torque S1	Torque S5	η	E-stop	C1f	ig	Et	Reversibility class	Fr	Fa
DYNABOX 25	5.2:1	11	89	8	13	88	9	15	87	11	18	86	14	23	84	46	0,03	$2,2 \times 10^{-6}$	2	1	1500	500
	7.25:1	11	88	8	14	87	9	15	86	11	18	85	14	24	82	46	0,03	$1,51 \times 10^{-6}$	2	1	1500	500
	10.25:1	11	87	8	13	86	8	14	85	11	18	84	14	23	81	46	0,03	$1,15 \times 10^{-6}$	2	1	1500	500
	14.5:1	13	82	9	15	81	11	18	79	12	20	77	16	26	74	46	0,03	$9,58 \times 10^{-7}$	2	2	1500	500
	19.5:1	13	80	9	15	78	11	18	76	12	20	74	16	26	70	46	0,03	$8,67 \times 10^{-7}$	2	2	1500	500
	30:1	15	73	11	18	70	12	20	68	14	23	65	17	29	60	46	0,03	8×10^{-7}	2	3	1500	500
	45:1	15	67	11	18	64	11	19	62	14	23	59	17	28	53	42	0,03	$7,77 \times 10^{-7}$	2	3	1500	500
	60:1	14	62	10	16	59	11	19	56	13	21	53	15	25	48	35	0,03	$7,6 \times 10^{-7}$	2	3	1500	500
DYNABOX 35	5.2:1	23	94	16	27	93	18	31	92	22	36	91	29	48	89	96	0,3	$7,4 \times 10^{-6}$	5	1	3800	2800
	7.25:1	23	92	17	28	91	19	32	90	23	37	89	30	48	86	96	0,3	$5,6 \times 10^{-6}$	5	1	3800	2800
	10.25:1	24	90	17	29	89	20	34	88	23	39	87	30	51	81	96	0,3	5×10^{-6}	5	1	3800	2800
	14.5:1	27	87	19	31	85	22	35	83	26	41	81	33	52	77	96	0,3	$4,4 \times 10^{-6}$	5	2	3800	2800
	19.5:1	28	84	20	32	82	22	35	80	26	42	78	33	50	73	96	0,2	$4,2 \times 10^{-6}$	5	2	3800	2800
	30:1	30	77	23	37	74	25	40	72	29	46	69	36	58	63	96	0,2	4×10^{-6}	5	3	3800	2800
	45:1	30	71	23	36	68	25	40	65	28	45	61	35	56	56	87	0,2	$3,9 \times 10^{-6}$	5	3	3800	2800
	60:1	30	65	22	34	62	24	37	59	27	41	55	34	50	50	73	0,1	$3,1 \times 10^{-6}$	5	3	3800	2800
	90:1	28	57	21	32	53	23	35	50	26	39	46	32	46	41	72	0,1	$2,31 \times 10^{-6}$	5	3	3800	2800
DYNABOX 45	5.2:1	54	95	36	62	94	41	70	93	50	83	92	67	109	91	214	0,4	$2,9 \times 10^{-5}$	9	1	5800	4000
	7.25:1	59	94	42	71	93	48	80	92	57	93	91	76	121	89	214	0,4	$2,2 \times 10^{-5}$	9	1	5800	4000
	10.25:1	68	93	46	80	92	53	88	91	62	98	90	80	128	88	214	0,4	$1,5 \times 10^{-5}$	9	1	5800	4000
	14.5:1	69	90	52	83	88	59	94	87	68	109	86	88	141	82	214	0,4	$1,4 \times 10^{-5}$	9	1	5800	4000
	19.5:1	66	89	50	80	87	55	88	86	64	102	84	81	129	80	214	0,3	1×10^{-5}	9	1	5800	4000
	30:1	74	83	55	88	80	61	98	78	70	112	76	88	141	71	214	0,3	1×10^{-5}	9	2	5800	4000
	45:1	74	77	54	86	75	59	94	72	68	109	69	83	133	64	185	0,3	$8,2 \times 10^{-6}$	9	3	5800	4000
	60:1	69	73	50	78	70	55	86	68	62	97	64	75	116	59	170	0,2	$7,3 \times 10^{-6}$	9	3	5800	4000
	90:1	63	66	46	71	62	50	76	59	57	86	56	68	99	50	154	0,2	$4,6 \times 10^{-6}$	9	3	5800	4000
DYNABOX 55	5.2:1	85	95	60	103	94	68	116	94	82	137	93	111	181	91	307	0,6	$7,5 \times 10^{-5}$	20	1	7000	4800
	7.25:1	88	94	65	111	93	74	125	92	90	147	91	118	188	89	307	0,6	$5,3 \times 10^{-5}$	20	1	7000	4800
	10.25:1	102	92	76	132	90	87	145	89	103	165	88	133	206	85	307	0,6	$4,5 \times 10^{-5}$	20	1	7000	4800
	14.5:1	96	90	71	115	88	82	133	87	96	155	85	123	190	82	307	0,6	$3,8 \times 10^{-5}$	20	1	7000	4800
	19.5:1	101	88	77	123	87	87	139	85	101	162	83	128	205	80	307	0,4	$3,1 \times 10^{-5}$	20	2	7000	4800
	30:1	107	82	83	130	80	94	148	78	109	169	75	136	202	70	307	0,4	$3,4 \times 10^{-5}$	20	2	7000	4800
	45:1	110	77	83	130	74	93	145	72	106	163	69	131	202	63	307	0,4	$2,8 \times 10^{-5}$	20	3	7000	4800
	60:1	110	73	82	128	69	91	141	67	103	158	63	126	194	58	286	0,3	$2,6 \times 10^{-5}$	20	3	7000	4800
	90:1	102	65	76	117	62	82	125	59	94	142	55	113	164	49	263	0,3	$1,2 \times 10^{-5}$	20	3	7000	4800
DYNABOX 63	5.2:1	128	95	90	153	95	105	179	94	126	210	93	169	275	91	497	0,8	$1,6 \times 10^{-4}$	36	1	8800	8500
	7.25:1	123	95	91	155	94	103	174	93	125	206	92	165	264	90	497	0,8	9×10^{-5}	36	1	8800	8500
	10.25:1	134	94	103	169	93	118	194	92	141	231	91	181	290	89	497	0,8	8×10^{-5}	36	1	8800	8500
	14.5:1	146	91	110	179	90	128	207	89	149	240	87	191	293	84	497	0,8	$6,9 \times 10^{-5}$	36	1	8800	8500
	19.5:1	155	90	119	190	88	135	215	87	156	250	85	199	318	82	497	0,5	$5,5 \times 10^{-5}$	36	1	8800	8500
	30:1	179	84	138	218	82	155	245	80	179	281	78	223	335	73	497	0,5	$5,9 \times 10^{-5}$	36	2	8800	8500
	45:1	163	80	123	193	77	137	214	75	156	239	72	193	287	67	403	0,5	5×10^{-5}	36	3	8800	8500
	60:1	162	76	121	189	73	134	205	71	151	233	67	186	288	62	404	0,4	$4,7 \times 10^{-5}$	36	3	8800	8500
	90:1	149	68	110	169	65	121	184	63	137	207	59	166	241	53	368	0,4	$3,2 \times 10^{-5}$	36	3	8800	8500
DYNABOX 75	5.2:1	213	96	147	252	95	174	296	94	209	349	94	282	459	92	834	1	$3,7 \times 10^{-4}$	50	1	10500	10500
	7.25:1	190	95	139	236	94	161	270	93	196	321	92	256	409	90	834	1	$2,5 \times 10^{-4}$	50	1	10500	10500
	10.25:1	187	94	146	234	93	168	269	92	204	326	91	261	418	88	834	1	$2,2 \times 10^{-4}$	50	1	10500	10500
	14.5:1	237	91	170	276	90	195	315	88	234	376	87	298	460	84	834	1	$1,9 \times 10^{-4}$	50	1	10500	10500
	19.5:1	228	89	168	270	88	194	310	87	227	362	85	288	434	81	834	0,6	$1,5 \times 10^{-4}$	50	2	10500	10500
	30:1	252	86	186	294	84	212	334	82	248	386	80	309	460	75	834	0,6	$1,6 \times 10^{-4}$	50	2	10500	10500
	45:1	243	79	190	299	76	212	331	74	244	383	71	301	472	65	718	0,6	$1,4 \times 10^{-4}$	50	3	10500	10500
	60:1	225	75	175	272	72	195	300	69	221	334	66	272	395	60	657	0,5	$1,3 \times 10^{-4}$	50	3	10500	10500
	90:1	218	68	167	257	64	184	280	62	209	316	57	255	370	52	625	0,5	8×10^{-5}	50	3	10500	10500
DYNABOX 90	5.2:1	332	96	227	387	95	271	460	95	327	546	94	445	725	92	1543	1,5	$8,5 \times 10^{-4}$	75	1	15800	13000
	7.25:1	376	95	263	460	95	306	490	95	373	597	94	490	784	92	1543	1,5	6×10^{-4}	75	1	15800	13000
	10.25:1	391	95	273	478	94	314	528	93	383	627	92	488	781	90	1543	1,5	$3,8 \times 10^{-4}$	75	1	15800	13000
	14.5:1	379	92	272	444	91	314	504	90	380	612	88	486	748	85	1543	1,5	$3,2 \times 10^{-4}$	75	1	15800	13000
	19.5:1	429	91	318	506	90	367	584	88	431	685	87	544	865	84	1543	0,8	$2,5 \times 10^{-4}$	75	1	15800	13000
	30:1	433	86	316	500	84	362	572	82	424	661	80	531	792	75	1543	0,8	$2,6 \times 10^{-4}$	75	2	15800	13000
	45:1	454	83	343	538	80	385	599	79	441	674	76	546	811	71	1255	0,8	$1,9 \times 10^{-4}$	75	3	15800	13000
	60:1	432	80	328	512	77	364	559	75	412	622	72	507	761	67	1230	0,5	$1,7 \times 10^{-4}$	75	3	15800	13000
	90:1	394	74	298	459	70	332	505	68	372	562	64	460	667	59	1114	0,5	1×10^{-4}	75	3	15800	13000
DYNABOX 110	5.2:1	567	96	390	666	95	458	779	95	561	937	94	760	1239	92	2289	2	$1,85 \times 10^{-3}$	120	1	21500	16000
	7.25:1	579	95	417	680	95	488	795	95	599	976	94	802	1307	92	2289	2	$1,3 \times 10^{-3}$	120	1	21500	16000
	10.25:1	650	95	449	786	94	522	878	93	638	1047	92	827	1323	90	2289	2	$8,5 \times 10^{-4}$	120	1	21500	16000
	14.5:1	630	93	450	720	92	519	830	91	630	1014	90	810	1247	87	2289	2	$6,3 \times 10^{-4}$	120	1	21500	16000
	19.5:1	670	92	510	815	91	589	943	90	705	1121	88	893	1349	85	2289	1	$4,6 \times 10^{-4}$	120	1	21500	16000
	30:1	790	88	597	955	87	688	1100	85	812	1299	83	1015	1512	79	2289	1	$3,5 \times 10^{-4}$	120	2	21500	16000
	45:1	776	85	583	915	82	665	1037	80	765	1168	78	947	1411	73	2152	1	$3,3 \times 10^{-4}$	120	3	21500	16000
	60:1	683	81	522	815	79	588	905	77	669	1030	73	826	1239	68	2094	0,8	3×10^{-4}	120	3	21500	16000
	90:1	645	75	497	765	72	557	847	70	625	944	66	778	1128	60	1941	0,8	$1,7 \times 10^{-4}$	120	3	21500	16000