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EJOT



The EJOT DELTA O PT[®] Fastener Predictable performance improvement for thermoplastics



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Benefits of the EJOT DELTA PT ®

Minimal radial tension due to optimized flank angle

High clamp loads

High tensile and torsion strength

Increased cycle stress stability

High strength under vibration

DELTA PT® prognosis programme allows a clamp load oriented design.

Long lifetime of the joint

Minimization of hydrogen embrittlement by use of through hardened steel [PT10]



Minimal radial tension

The optimized thread flank angle of the EJOT DELTA PT® screw reduces the radial stress compared to common 60° flank angles of sheet metal screws.

The 20° respectively 30° angle creates only minor radial tension and therefore allows thin-wall design.

The bigger force in axial direction allows an optimum flow of the displaced material.







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High clamp loads

The thread helix angle is engineered to optimize the highest possible clamp load and lowest contact pressure in the plastic material. This provides a higher flank coverage at equal installation depth, giving the possibility of material cost reduction.

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Predictable performance improvement



High tensile and torsion strength

X Avdel southco BBA

The enlarged core diameter increases the tensile and torsion strength. As a result of this, even in high-filled thermoplastics, higher tightening torques and better clamp loads are being achieved.



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Design recommendations

The precondition for a safe screw joint is the functional design of the components.

In principle, the boss design should correspond to the illustrated design recommendation.

The counterbore is of special importance, as it ensures a favourable edge stress reduction, thus preventing boss cracking. In addition, the counterbore acts as a lead-in and guidance during initial thread forming.

Boss design

The most favourable hole diameter has in most cases proven to be:

						-												
	d,	=	0,8	x,0	1, ±	tole	erar	nçe	qf	sçre	wc	liar	net	er	8.5		*	
						10	ee t	overa	ince	pag	e 10	9 ₌				+		
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ii.	st	reh	gth	the	Hb	le'd	iah	ete	r ča	in'b	e'in	cre	aše	ďu	pito	•		
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2							$\mathcal{D}_{\mathcal{D}}$						12				1	
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ii.		8	-			*	ii.			Ŷ	8	*	2		8			
÷		8			\mathbb{R}^{n}	Ξ.	10			\otimes	83		1		8	4		
ŧ		5		1	18	5	53		- 16	8	5	*	38		5			
						*										+		



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Tolerances

Nominal value [mm]										
Tolerance		over 3	over 6	over 10	over 18	over 30	over 50	over 80		
	to 3	to 6	to 10	to 18	to 30	to 50	to 80	to 120		
h 14	0 -0,25	0 -0,30	0 -0,36	0 -0,43	0 -0,52					
h 15	0 -0,40	0 -0,48	0 -0,58	0 -0,70	0 -0,84					
js 14	± 0,12	± 0,15	± 0,18		100					
js 16	± 0,30	± 0,375	± 0,45	± 0,55	± 0,65	± 0,80	± 0,95	± 1,10		
js 17			± 0,75	± 0,90	± 1,05	± 1,25	± 1,50			

screw	10	12	14	16	18	20	22	25	
External-Ød,	1,4	1,2	1,4	1,6	1,8	2,0	2,2	2,5	
Tolerance	+0,08	+0,08	+0,08	+0,08	+0,08	+0,08	+0,08	+0,10	8
screw	30	35	40	45	50	60	70	80	100
External-Ø d,	3,0	3,5	4,0	4,5	5,0	6,0	7,0	8,0	10,0
Tolerance	+0,10	+0,10	+0,10	+0,10	+0,15	+0,15	+0,18	+0,18	+0,25

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EJOT DEL	TA PT [®]	Dimension	15		10	12	14	16	18	20	22	25	
1		External th	read-Ø	d,	1,00	1,20	1,40	1,60	1,80	2,00	2,20	2,50	
		Core-Ø		d	0,64	0,78	0,93	1,07	1,22	1,36	1,51	1,72	
		Thread pite	:h	P	0,44	0,51	0,57	0,64	0,71	0,78	0,85	0,95	
		Thread run	-out	X _{max} ,	0,50	0,60	0,70	0,80	0,90	1,00	1,10	1,30	
WN 5411	1	Head-Ø		D	~		3,20	3,60	4,00	4,50	5,00	5,50	1
		Head heigh	nt	K	1	~	1,15	1,20	1,35	1,40	1,60	1,80	
		Washer thi	ckness	S	1	1	0,50	0,60	0,60	0,60	0,60	0,70	
8	Sec.	Radius		Rmax	1	1				0,35	0,35	0,40	
4	A	H-cross-	Penetration	t min.	1	2				0,51	0,68	0,82	
	X	recess	depth	max.	~					0,97	1,14	1,28	
((教)	Z-Cross-	Penetration	t min.	~				-	0,73	0,86	1,01	
	×	Correct	Depetration	max.	-		0.56	0.91	1.01	0,98	1,11	1,20	
((T)	recess	denth	t max	-	-	0.84	110	1,01				
	9	Cross size I	H/Z/C	max.			0,04	0	0	1	1	1	
WN 5412		Head-Ø	26	D		-				3,50	3,90	4,40	
		Head heigh	nt	K		-				1,60	1,60	1,90	
	~	Hadius	Depatration	Rmax		-				0,35	0,35	0,40	
+	(\Rightarrow)	recess	depth	t max	-	-				1.10	1.20	1.38	
	X	7-oross-	Penetration	min		-				0.82	0.92	1,00	
(\$\$)	recess	depth	t max.		-				1.07	1,17	1,33	
,	A	C-cross-	Penetration	, min.		1					Tall C		
(Ð	recess	depth	t max.	1	~							
		Cross size	H/Z/C			~				1	1	1	
WN 5451		Head-Ø		D		~	3.20	3.60	4.00	4,50	5,00	5.50	
		Head heigh	nt	K	1	-	1,15	1,20	1.35	1,60	1,60	1,90	
		Washer thi	ckness	s	1	~	0,50	0,60	0,60	0,60	0,60	0,70	
2		Radius		Rmax	~	1	0,20	0,25	0,25	0,35	0,35	0,40	
-	A	TOR Xelas	/AUTOSERT®		1	1	3IP	5IP	6IP	6IP	6IP	8IP	
(S			A _{Ret}	~	~	1,20	1,45	1,75	1,75	1,75	2,40	
		Penetratio	n depth	t min.	5	>	0,40	0,50	0,50	0,65	0,65	0,80	
17. A.				max.	1	1	0,55	0,65	0,65	0,85	0,85	1,00	
WN 5452		Head-Ø		D	2,00	2,30	2,60	3,00	3,30	3,50	3,90	4,40	
		Head heig	ht	K	0,80	0,95	1,05	1,20	1,30	1,60	1,60	1,90	
		Radius		R _{max}	0,20	0,20	0,20	0,25	0,25	0,35	0,35	0,40	
	0	TORXelas	/AUTOSERT®		2IP	3IP	3IP	5IP	6IP	6IP	6IP	8IP	
	C			A _{Ret}	1,00	1,20	1,20	1,45	1,75	1,75	1,75	2,40	
		Penetratio	n depth	t min.	0,30	0,35	0,35	0,50	0,50	0,65	0,65	0,80	
-				max.	0,45	0,50	0,50	0,05	0,65	0,85	0,85	1,00	
WN 5453		Head-Ø		D	1	>				4,00	4,40	5,00	
		Cyl. head I	height	Cmax	2	2			1	0,35	0,35	0,55	
		Calotte he	ight	≈ f	-					0,40	0,40	0,50	
	~	Radius	141	Rmax	0	>				0,80	0,80	1,00	
	0	TORXelus	/ AUTOSERT®	-	-					6IP	6IP	8IP	
a a				A _{Ret.}	-	-				0.65	0.65	0.80	
8	S		CONTRACTOR OF A	t min.	-	-				0,85	0,85	1,00	
1 1	e	Penetratio	n depth	max.	-	1							
		Penetratio	n depth	max.	0.05	0.05	0.00	0.05	0.55	1.00	4.40	5.00	
. ⁴ 8 1 WN 5454		Penetratio	n depth	D	2,35	2,65	2,80	3,35	3,65	4,00	4,40	5,00	
	•	Penetratio Head-Ø Cyl. head I	n depth height	D Cmax	2,35	2,65	2,80	3,35 0,35	3,65 0,35	4,00	4,40 0,35	5,00 0,55	
WN 5454		Penetratio Head-Ø Cyl. head Radius	height	D Cmax Rmax	2,35 0,20 0,40	2,65 0,25 0,40	2,80 0,30 0,50	3,35 0,35 0,60	3,65 0,35 0,60	4,00 0,35 0,80	4,40 0,35 0,80	5,00 0,55 1,00	
WN 5454	0	Penetratio Head-Ø Cyl. head I Radius	n depth height /AUTOSERT®	D Cmax Rmax	2,35 0,20 0,40 2IP	2,65 0,25 0,40 3IP	2,80 0,30 0,50 3IP	3,35 0,35 0,60 5IP	3,65 0,35 0,60 6IP 1,75	4,00 0,35 0,80 6IP	4,40 0,35 0,80 6IP	5,00 0,55 1,00 8IP 2,40	
WN 5454	0	Penetratio Head-Ø Cyl. head Radius TOR Xetee	height	D C _{max} R _{max}	2,35 0,20 0,40 2IP 1,00 0,30	2,65 0,25 0,40 3IP 1,20 0,35	2,80 0,30 0,50 3IP 1,20 0,35	3,35 0,35 0,60 5IP 1,45 0,50	3,65 0,35 0,60 6IP 1,75 0,50	4,00 0,35 0,80 6IP 1,75 0,50	4,40 0,35 0,80 6IP 1,75 0,50	5,00 0,55 1,00 8IP 2,40 0,70	

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												D	esign
	EJOT DELTA PT	[®] Dimension	ns		30	35	40	45	50	60	70	80	100
		External th	nread-Ø	d,	3,00	3,50	4,00	4,50	5,00	6,00	7,00	8,00	10,00
		Core-Ø		d ₂	2,09	2,45	2,81	3,17	3,53	4,26	4,98	5,70	7,15
		Thread pit	ch	P	1,12	1,29	1,46	1,63	1,80	2,14	2,48	2,82	3,50
	5	Thread run	n-out	X _{max.}	1,50	1,80	2,00	2,30	2,50	3,00	3,50	4,00	5,00
11172													
Luchia	WN 5411	Head-Ø		<u>D</u>	6,50	7,50	9,00	10,00	11,00	13,50	15,50	-	-
		Head heig	ht	ĸ	2,10	2,40	2,50	2,50	3,20	4,00	4,60	_	
× • • •		Washer th	ickness	S	0,80	0,90	1,00	1,00	1,20	1,40	1,60	_	
	4.0	Radius		Rmax	0,50	0,50	0,60	0,60	0,70	0,80	0,90	-	
		H-cross-	Penetration	t min.	1,15	1,07	1,33	1,33	1,98	2,24	2,84	_	-
	\mathbb{Y}	recess	depth	max.	1,61	1,70	1,96	1,96	2,61	2,90	3,50		_
d1	(25)	Z-cross-	Penetration	t min.	1,26	1,08	1,40	1,40	2,01	2,21	2,91		
	Ś	recess	depth	max.	1,51	1,54	1,86	1,86	2,47	2,73	3,37		
	(472)	C-cross-	Penetration	t min.		~	-	2	_	2	-	-	~
	•	recess	depth	max.		>	-			-		>	-
		Cross size	H/Z/C		1	2	2	2	2	3	3	S	i - 3
D/hH	WN 5412	Head-Ø		D	5 30	610	700	7.50	8.80	10.50	12:30		
		Head heig	ht	K	2.30	2,70	3.10	3.20	3,50	4,20	Desig 0 70 80 10 0 7,00 8,00 10,0 6 4,98 5,70 7,' 4 2,48 2,82 3,' 0 3,50 4,00 5,0' 0 16,60 - - 0 16,0 - - 0 3,50 - - 7 2,91 - - 3 3,37 - - 0 12,30 - - 0 5,10 - - 0 3,66 - - 7 3,14 - - 3 3,61 - - 0 15,50 18,00 - 0 15,60 1,80 - 0 1,60 1,80 - 0 1,60 1,80 - 0 1,60 1,80 -		
Ix 1 20		Radius		R	0.50	0.50	0.60	0.60	0.70	0.80	0.90		
	(th)	H-cross-	Penetration	min	119	1.23	1.51	1.51	212	244	3.00		
-*	$\left(\left(\left$	recess	depth	tmax	1.65	1.86	214	214	2 75	310	3.66		
-		7-cross-	Penetration	min	1.36	1.26	1.62	1.62	2.23	2.57	314		
-61.	(柴)	recess	depth	tmax	1.61	1.72	2.08	2.08	2.67	3.03	3.61		
	×	C-Kreuz-	Penetration	min.	1,01	1110	100	2,00	2,01	0,00	0,01	<	
	(T)	schlitz	depth	t max.	\sim		-	-	\sim	-	-	0	0
	\sim	Cross size	H/Z/C	TTTEET G	1	2	2	2	2	3	3		
	2												
D/hts	WN 5451	Head-Ø		D	6,50	7,50	9,00	10,00	11,00	13,50	15,50	18,00	
		Head-heig	ht	K	2,30	2,70	3,10	3,20	3,50	4,20	4,90	5,60	
× 1 Pax		Washer thi	S	0,80	0,90	1,00	1,10	1,20	1,40	1,60	1,80		
	1923	Radius		R _{max}	0,50	0,50	0,60	0,60	0,70	0,80	0,90	1,00	
14 H		TORXelus	/AUTOSERT®		10IP	15IP	201P	20IP	25IP	30IP	30IP	40IP	
	I I I I I I I I I I I I I I I I I I I			ARet	2,80	3,35	3,95	3,95	4,50	5,60	5,60	6,75	
al-		Penetratio	n depth	t min.	1,00	1,10	1,40	1,40	1,50	1,90	2,30	2,60	
	-			max.	1,30	1,50	1,80	1,80	1,90	2,40	2,90	3,20	
La D/hH at	WALE 4ED	Hand O		D	E 20	8.10	700	750	0.00	10 50	10.00	1410	1700
1 2001	WIN 5452	Head-10	2 0	U	0,30	0,10	7,00	7,00	0,00	10,50	12,00	14,10	17,00
		Read heigi	III.	R	2,30	2,70	0.60	3,20	3,50	4,20	4,90	1,00	0,00
- 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10	\frown	TOPY	(ALITOSEDT®	H _{max}	100	1510	2010	2010	2510	300	300	1,00	5010
2	(O)	TOR Aclas	AUTOSER1-	-	2.90	2.05	2010	2012	201P	5 SC	5 CO	6.75	POF
14 A	٢			ARet.	2,00	1.10	1.40	1.40	4,00	1.00	2.20	0,70	3,00
		Penetratio	n depth	t max	1,00	1,10	1,40	1,40	1,00	2.40	2,00	3.20	3,00
⁹	-			max.	1,00	1,00	1,00	1,00	1,00	2,40	2,00	0,20	0,70
200 D (1)04	WN 5453	Head-Ø		D	6,00	7,00	8,00	9,00	10,00	12,00	14,00	16,00	20,00
K And L		Cyl. head h	eight	C	0,55	0,65	0,70	0,70	0,75	0,85	0,90	0,95	1,10
· .		Calotte hei	ght	≈f	0,70	0,80	1.00	1,00	1,20	1,20	1,30	1,40	1,60
2		Radius		R	1,20	1,40	1,60	1,80	2,00	2,40	2,60	3,20	4,50
		TORXelus	/ AUTOSERT®	inda.	10IP	15IP	201P	201P	25IP	30IP	30IP	40IP	50IP
-	(Q)	2		Apet	2,80	3,35	3,95	3,95	4,50	5,60	5,60	6,75	8,95
348	\bigcirc	Design of the		, min.	1,00	1,10	1,40	1,40	1,50	1,90	2,30	2,60	3,00
1		Penetration	n depth	max.	1,30	1,50	1,80	1,80	1,90	2,40	2,90	3,20	3,70
10/his	WN 5454	Head-Ø		D	6,00	7,00	8,00	9,00	10,00	12,00	14,00	16,00	20,00
		Cyl. head h	neight	Cmax	0,55	0,65	0,70	0,70	0,75	0,85	0,90	0,95	1,10
Se a		Radius		Rmax	1,20	1,40	1,60	1,80	2,00	2,40	2,60	3,20	4,50
		TORXelas"	/AUTOSERT®	· · · · · ·	10IP	15IP	20IP	201P	25IP	301P	30IP	401P	50IP
	Q			ARet	2,80	3,35	3,95	3,95	4,50	5,60	5,60	6,75	8,95
-		Penetratio	depth	t min.	0,75	0,95	1,10	1,25	1,25	1,50	2,30	2,40	3,00
-1-		- onoration	1 John	max.	1.00	1,30	1,45	1,70	1.65	2.00	2,90	2.90	3,70

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