



**ecosyn<sup>®</sup>-plast**  
The screw for thermoplastics

**BOSSARD**

## **Bossard ecosyn<sup>®</sup>-plast** – The screw for thermoplastics



**Excellent load-bearing capacity**

**Excellent process capability**

**High levels of binding safety**



In day-to-day situations too:  
Material-compatible threads are  
needed everywhere

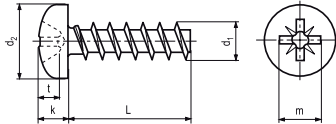
## Pan head screws with form Z Pozidriv cross recess (pan head in accordance with ISO 7049)

- **BN 82428**  
400 HV case-hardened steel, blue-galvanised

- **BN 82429**  
A2 grade stainless steel

d	2,2	2,5	3	3,5	4	5
$d_1$	2,2	2,5	3	3,5	4	5
$d_{2\ max}$	4	5	5,6	7	8	9,5
k max	1,6	2,1	2,4	2,6	3,1	3,7
⊗	1	1	1	2	2	2
m ~	2,3	2,6	2,9	3,9	4,4	4,6
t	min.	1	1,1	1,35	1,9	2,3
	max.	1,3	1,5	1,75	1,9	2,35

d	2,2	2,5	3	3,5	4	5
6	●	●	●			
8	●	●	●●	●●	●●	
10	●	●	●●	●●	●●	●
L 12	●	●	●●	●●	●●	●
14	●	●	●	●	●	●
16	●	●	●●	●●	●●	●
20			●●	●●	●●	●
25			●	●●	●●	●



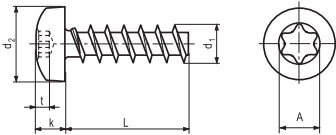
## Hexalobular (6 Lobe) socket pan head screws (pan head in accordance with ISO 7049)

- **BN 84229**  
Steel case-hardened 400 HV, zinc plated blue

- **BN 15858**  
Stainless steel A2

d	2,2	2,5	3	3,5	4	5
$d_1$	2,2	2,5	3	3,5	4	5
$d_{2\ max}$	4	5	5,6	7	8	9,5
k max	1,6	2,1	2,4	2,6	3,1	3,7
⊗	X6	X8	X10	X15	X20	X25
A ~	1,8	2,4	2,8	3,4	4	4,5
t	min.	0,63	0,91	1	1,07	1,52
	max.	0,77	1,04	1,27	1,33	1,66

d	2,2	2,5	3	3,5	4	5
6	●	●				
8	●	●	●●	●●	●●	
10	●	●	●●	●●	●●	●
L 12	●	●	●●	●●	●●	●
14	●	●	●	●	●	●
16	●	●	●●	●●	●●	●
20			●●	●●	●●	●
25			●	●●	●●	●

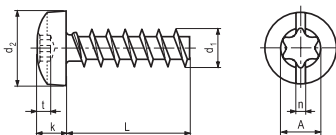


## Hexalobular (6 Lobe) socket pan head screws «Freedrivr» with slot (pan head in accordance with ISO 7049)

- **BN 20002**  
Steel case-hardened 400 HV, zinc plated blue

d	2,2	2,5	3	3,5	4	5
$d_1$	2,2	2,5	3	3,5	4	5
$d_{2\ max}$	4	5	5,6	7	8	9,5
k max	1,6	2,1	2,4	2,6	3,1	3,7
n max	0,6	0,7	0,8	1	1,2	1,2
⊗	X6	X8	X10	X15	X20	X25
A ~	1,8	2,4	2,8	3,4	4	4,5
t	min.	0,63	0,91	1	1,07	1,52
	max.	0,77	1,04	1,27	1,33	1,66

d	2,2	2,5	3	3,5	4	5
6	●	●				
8	●	●	●	●	●	
10	●	●	●	●	●	
L 12	●	●	●	●	●	●
14	●	●	●	●	●	●
16	●	●	●	●	●	●
20			●	●	●	●
25			●	●	●	●



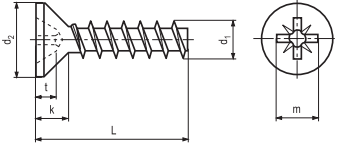
## Countersunk screws with form Z Pozidriv cross recess (countersunk head in accordance with ISO 7050)

### ● BN 82427

400 HV case-hardened steel,  
blue-galvanised

d	2,2	2,5	3	3,5	4
$d_1$	2,2	2,5	3	3,5	4
$d_{2\text{ max}}$	3,8	4,7	5,5	7,3	8,4
k max	1,2	1,5	1,65	2,35	2,7
⊕	1	1	1	2	2
m ~	2,2	3	3,2	4,3	4,6
t	min.	0,63	0,91	1,07	1,27
	max.	0,77	1,04	1,27	1,33

d	2,2	2,5	3	3,5	4
6	●	●			
8	●	●	●	●	●
10	●	●	●	●	●
12	●	●	●	●	●
14	●	●	●	●	●
16	●	●	●	●	●
20			●	●	●
25			●	●	●



## Important Notes

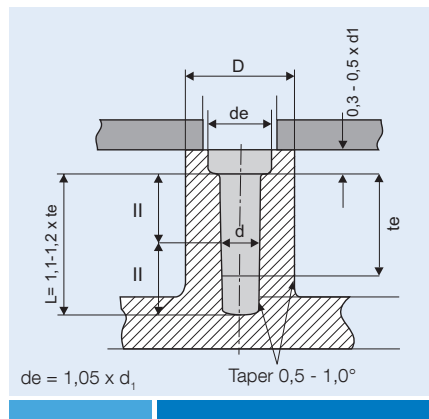
- Pan head in accordance with ISO 7049, countersunk head in accordance with ISO 7050.
- Other head forms, thread ends or lengths are available at any time with the corresponding minimum order amounts.
- Fasteners  $\geq 320$  HV: Risk of hydrogen embrittlement on blue-galvanised surface coatings cannot be excluded.

## Construction recommendations

In order to ensure optimal construction which proves effective in practise, the tube geometry of the various materials must be adapted.

The details shown here are based on laboratory trials with modelled pieces. Some changes may be needed for use in practice. We recommend carrying out controlled screw connections using the first available specimens.

The pressure relief hole ensures a favourable distribution of the edge stresses and reduces crack formation in the tube area.



Material depth	Hole- Ø	External- Ø	Screw
	d	D	te
ABS / PC blend	0,80 x d1	2,00 x d1	2,00 x d1
ASA	0,78 x d1	2,00 x d1	2,00 x d1
PA 4.6	0,73 x d1	1,85 x d1	1,80 x d1
PA 4.6 - GF 30	0,78 x d1	1,85 x d1	1,80 x d1
PA 6	0,75 x d1	1,85 x d1	1,70 x d1
PA 6 - GF 30	0,80 x d1	2,00 x d1	1,90 x d1
PA 6.6	0,75 x d1	1,85 x d1	1,70 x d1
PA 6.6 - GF 30	0,82 x d1	2,00 x d1	1,80 x d1
PBT	0,75 x d1	1,85 x d1	1,70 x d1
PBT - GF 30	0,80 x d1	1,80 x d1	1,70 x d1
PC	0,85 x d1	2,50 x d1	2,20 x d1
PC - GF 30	0,85 x d1	2,20 x d1	2,00 x d1
PE (weich)	0,70 x d1	2,00 x d1	2,00 x d1
PE (hart)	0,75 x d1	1,80 x d1	1,80 x d1
PET	0,75 x d1	1,85 x d1	1,70 x d1
PET - GF 30	0,80 x d1	1,80 x d1	1,70 x d1
PMMA	0,85 x d1	2,00 x d1	2,00 x d1
POM	0,75 x d1	1,95 x d1	2,00 x d1
PP	0,70 x d1	2,00 x d1	2,00 x d1
PP -TV 20	0,72 x d1	2,00 x d1	2,00 x d1
PPO	0,85 x d1	2,50 x d1	2,20 x d1
PS	0,80 x d1	2,00 x d1	2,00 x d1
PVC (hart)	0,80 x d1	2,00 x d1	2,00 x d1

## Assembly notes

- Secure and cost-effective fastenings can only be produced with screwdrivers which have controlled torque and/or turning angle.
- The heat needed for low-stress formation of the thread in plastics is created by friction generated when driving in the screw.
- The rotational speed should lie between 300 and 800 rpm.
- Both electrically- and pneumatically-powered screwdrivers can be used.

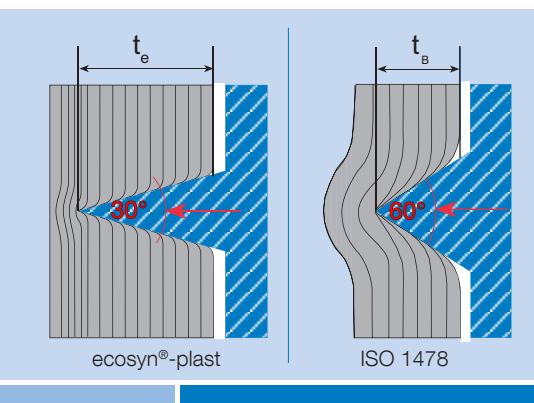
$d_1$  = nominal thread -Ø



## ecosyn®-plast Screws

Within the area of binding technology, plastics present particular requirements concerning the elements used and their assembly techniques. Ecosyn®-plast screws are the result of the knowledge gained through years of practical expe-

rience in thermoplastic screwing. The special thread geometry enables safe and easy screwing directly into thermoplastic elements.



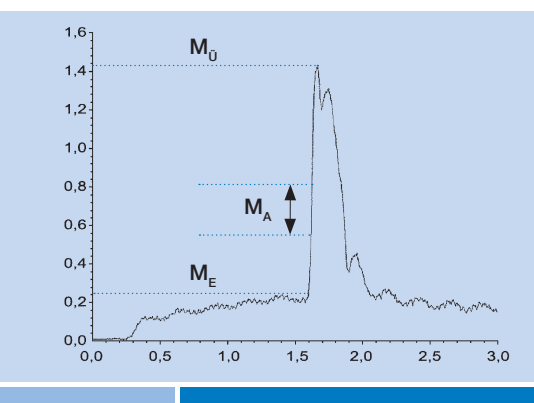
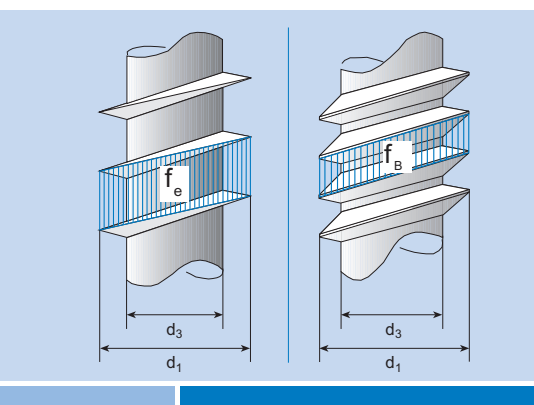
## The thread geometry

In contrast to conventional tapping screws in accordance with ISO 1478, eco-syn screws have:

- A pointed thread angle of 30° in place of 60°
- A smaller core diameter with the same nominal diameter
- A larger thread pitch

The combination of these special characteristics leads to decisive advantages:

- Improved thread load-bearing depth ( $t_e > t_B$ )
- Smaller radial force, therefore higher load capacity
- Less burst effect in single-screw tubes
- More material between thread flanks ( $f_e > f_B$ ), and therefore larger shear cylinder
- Lower driving torque and higher stripping torque leads to improved assembly and binding safety



## Determining what torque to use

In order to achieve optimal safety during assembly, the difference between the driving torque ( $M_E$ ) and the stripping torque ( $M_U$ ) must be as large as possible. The true screwing parameters can be established by Bossard, using original components in their «Applications testing laboratory»

The optimum tightening torque ( $M_A$ ) to be set on the screwdriver for the mounting process is determined based on customer-specific requirements. The results are then documented in the form of a «Technical Report».

