The **Profile Damper Type TC** from the innovative ACE TUBUS Series is a maintenance free, self-contained damping element made from a special Co-Polyester Elastomer. They have been specially developed for Crane equipment applications and fulfill the international Industry standards OSHA and CMAA.

Many crane applications require a spring rate with a high return force. This is achieved with the unique **Dual-Profile Concept** of the TC-S models. For Energy-Management-Systems the TC model types provide a cost efficient solution with a high return force capability.

The very small and light package size from ø 64 mm up to ø 176 mm covers an energy absorption capacity ranging from 450 Nm up to 12 720 Nm/cycle. The excellent resistance to UV, seawater chemical and microbe attack together with the wide operating temperature range from -40°C to 90°C enables a wide range of applications.

Life expectancy is extremely high; **up to twenty times** longer than for urethane dampers, up to **ten times** longer than rubber buffers and up to **five times** longer than steel springs.

One-Piece Profile Body

Mounting Screw
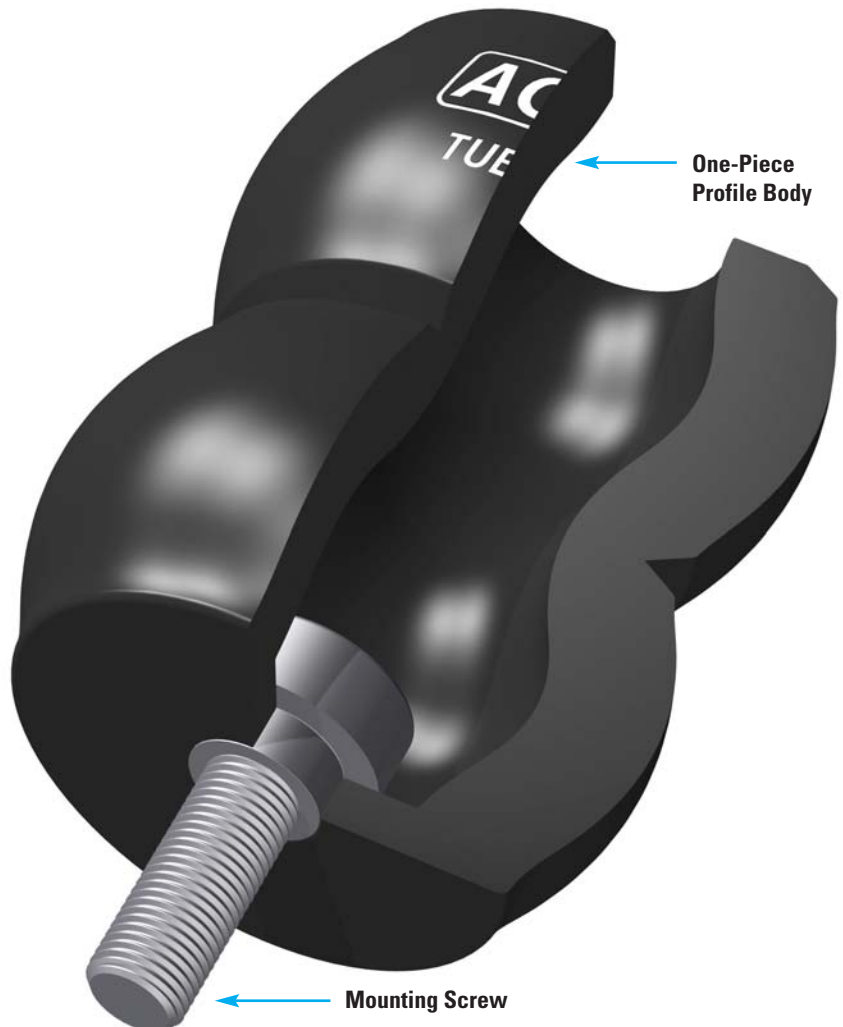
Overload capacity: For emergency use only (1 cycle) it is possible to exceed the W_3 rating by +40%.

Environment: Resistant to oil, grease, seawater and to microbe or chemical attack. Excellent UV and ozone resistance. Material does not absorb water or swell.

Dynamic force range: 80 000 N to 978 000 N

Temperature range: -40°C to 90°C

Energy absorption: 31% to 63%

Material hardness rating: Shore 55D

Mounting: in any position

Impact velocity range: up to max. 5 m/s
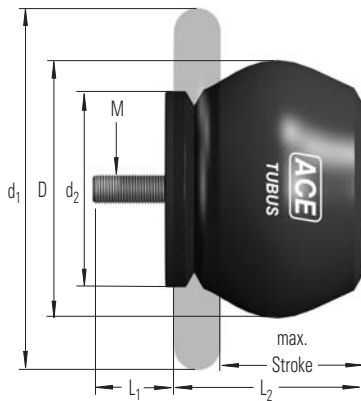
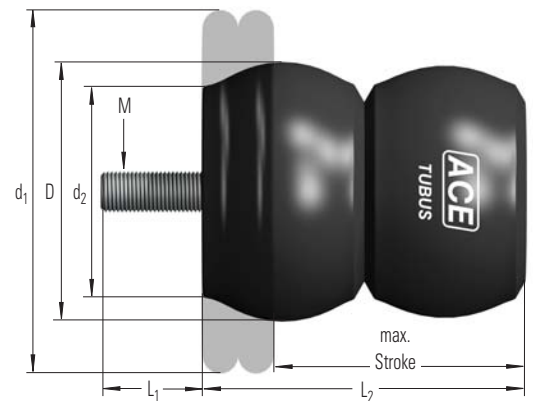**Mounting screw torque:**
M12: 85 Nm
M16: 210 Nm

On request: special strokes, -characteristics, -spring rates, -sizes and materials.

Calculation and selection to be approved by ACE.

Model type TC

Model type TC-S

Ordering Example — TC 83-73-S

TUBUS Crane Buffer
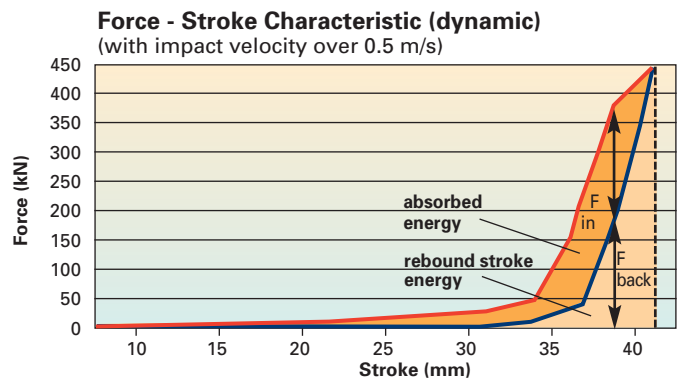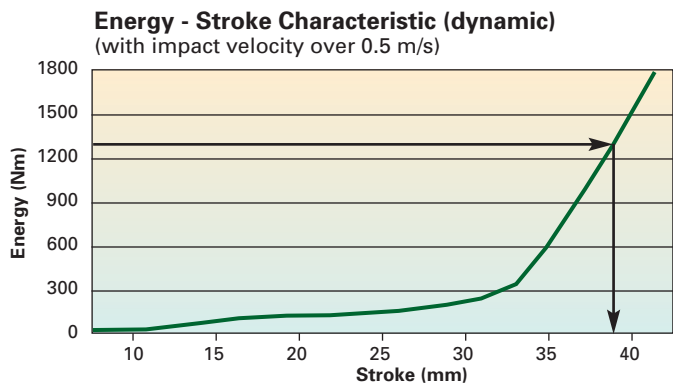Outer-ø 83 mm
Stroke 73 mm
Model type soft

The calculation and selection of the required profile damper should be carried out or be approved by ACE.

Dimensions and Capacity Chart

Type	*W₃ Nm/cycle	max. Stroke mm	D	L₁	M	L₂	d₁	d₂	Weight in kg
TC 64-62-S	450	62	64	12	M12	79	89	52	0.2
TC 74-76-S	980	76	74	12	M12	96	114	61	0.25
TC 83-73-S	1900	73	83	12	M12	94	127	69	0.3
TC 86-39	1210	39	86	12	M12	56	133	78	0.25
TC 90-49	1630	49	90	12	M12	68	124	67	0.25
TC 100-59	1770	59	100	12	M12	84	149	91	0.5
TC 102-63	1970	63	102	16	M16	98	140	82	0.5
TC 108-30	1900	30	108	12	M12	53	133	77	0.35
TC 117-97	3710	97	117	16	M16	129	188	100	1.0
TC 134-146-S	7290	146	134	16	M16	188	215	117	1.6
TC 136-65	4250	65	136	16	M16	106	178	106	1.1
TC 137-90	6350	90	137	16	M16	115	216	113	1.1
TC 146-67-S	8330	67	146	16	M16	118	191	99	1.5
TC 150-178-S	8860	178	150	16	M16	241	224	132	2.6
TC 153-178-S	7260	178	153	16	M16	226	241	131	2.3
TC 168-124	10100	124	168	16	M16	166	260	147	2.3
TC 176-198-S	12720	198	176	16	M16	252	279	150	3.6

* Max. Energy capacity per cycle for continuous use. For emergency use only (1 cycle) it is possible to exceed this rating by +40%.

Characteristics of Type TC 90-49

Energy - Stroke Characteristic (dynamic)
(with impact velocity over 0.5 m/s)

Force - Stroke Characteristic (dynamic)
(with impact velocity over 0.5 m/s)

With the aid of the characteristic curves above you can estimate the proportion of the total energy that will be absorbed. Example: With impact energy of 1300 Nm the Energy-Stroke diagram shows that a stroke of about 38 mm is needed. On the Force-Stroke diagram you can estimate the proportion of absorbed energy to rebound energy at this stroke length.
Note: with these types the return force towards the end of the stroke is significant and we recommend you try to use a minimum of 90% of the total stroke available.

Dynamic (v > 0.5 m/s) and static (v ≤ 0.5 m/s) characteristics of all types are available on request.